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U. S. DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES

U.S. Bureau of Commercial Fisheries.

# REPORT

OF THE

# UNITED STATES COMMISSIONER OF FISHERIES

FOR THE FISCAL YEAR 1932

WITH

# APPENDIXES

HENRY O'MALLEY
Commissioner

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# National Oceanic and Atmospheric Administration

## Report of the United States Commissioner of Fisheries

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## ERRATA

Page 97, second column, line 11: Rhode Island should be given as page *177* instead of page *178*.

Page 241: Under the box head "Salem" the value for shad should be *$17,230* instead of *$7,230*.

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# U.S. DEPARTMENT OF COMMERCE

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# REPORT OF THE COMMISSIONER OF FISHERIES

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DEPARTMENT OF COMMERCE,
BUREAU OF FISHERIES,
*Washington, July 1, 1932.*

The honorable the SECRETARY OF COMMERCE.

DEAR MR. SECRETARY: I have the honor to submit the following résumé of the operations of the Bureau of Fisheries during the fiscal year ended June 30, 1932.

The fishing industry in all its branches has suffered severely in common with other producers of foodstuffs. The extensive decline in prices, especially of those products with which fish normally compete in the retail markets, has faced the industry with actual disaster. The complexity of the system of fish distribution, seasonal character of supply, remoteness of centers of production from population centers, and the limitation of the consumption of fish combine to make it most difficult for fishery operators to compete at present price levels. The temporary scarcity of some staples has tended to keep up the cost of production and added to the difficulties of the producers of such products. On the other hand, advances in quick freezing, the packaging of fresh and frozen fish, and the value of marine products in the diet in combating faulty nutrition are tending to popularize fishery products with the consuming public. With the development of improvements in fish manufacture and merchandising, especially with respect to adequate display and refrigerating equipment suitable for handling quick-frozen foods satisfactorily and their more general installation in retail stores, and the education of the public to a realization that frozen foods can be fully as sound, palatable, and nutritious as the fresh products, we may expect this branch of the fishery trade to become more stabilized.

Our industrialization has created conditions making it more difficult to keep our waters adequately stocked with aquatic life. To overcome these handicaps the number of Federal, State, and private fish-cultural units has been increased. There are 87 Federal stations and substations in 36 States and the Territory of Alaska and about 390 State hatcheries. In addition, there are 130 private trout hatcheries, about 45 goldfish farmers, and several hundred clubs raising fish for stocking purposes.

The output of fish and eggs by the bureau's propagation units exceeded 7,000,000,000, representing a slight decrease as compared with the previous year. The take of fur-seal skins on the Pribilof Islands in 1932 again exceeded 49,000, being slightly less than in 1931.

Commercial fishing is prosecuted on the high seas, along our entire coast line including Alaska, on the Great Lakes, and in interior waters. These fisheries during the calendar year 1930 furnished employment to about 120,000 fishermen and 84,000 persons engaged in transporting, manufacturing, and the wholesale trade, making a total

of 204,000 persons who depend directly upon our fisheries for a livelihood. This was about 13,000 more than were employed during the previous year. The catch in 1930 amounted to 3,286,580,000 pounds for which the fishermen received $109,349,000—a decrease of 8 per cent in amount and 11 per cent in value as compared with the previous year.

In the calendar year 1930 the output of canned fish amounted to 576,685,000 pounds, valued at $82,858,000, and in 1931, 506,414,000 pounds, valued at $62,949,000. The output of fresh, frozen, and smoked packaged fish in 1930 exceeded 80,000,000 pounds, valued at $12,580,000, as compared with 65,551,000 pounds, valued at $9,224,000 in 1931. In these two years the amounts of fish frozen were 139,297,000 and 112,257,000 pounds, respectively, and the value of by-products $23,721,000 and $16,565,000, respectively. Imports of fishery products for consumption were valued at $50,830,000 in 1930 and $43,033,000 in 1931, while the value of domestic exports was $17,276,000 and $11,574,000, respectively.

## INTERNATIONAL RELATIONS

### REVISED NORTHERN PACIFIC HALIBUT CONVENTION

Despite the comparatively recent origin of the eastern North Pacific halibut fishery and the fact that the fishing area has been increased from 500 miles of coast line in 1910 to 2,000 miles in 1930, the fishery is in a serious condition as indicated by the following facts: (1) Regardless of the great expansion in fishing areas, the annual catch has remained nearly the same; (2) the fishing power of the fleet has been increased from 200,000 sets of gear units in 1910 to 1,000,000 sets in 1930 to maintain this level of production; (3) the catch on the southern grounds has fallen from a maximum of 60,000,000 pounds in 1912 to 22,500,000 pounds in 1930, and from the grounds in the Gulf of Alaska from a maximum of 26,000,000 pounds in 1924 to 17,500,000 pounds in 1930; (4) the catch per set of gear on the oldest areas fished has fallen from 260 pounds in 1906 to 36½ pounds in 1931; (5) the decline in abundance is also taking place on the newer grounds, and the fishery is now dependent upon constantly smaller sizes of fish; (6) eggs and larvæ are almost absent from the southern grounds, and the spawning schools are much reduced on the newer banks.

The enabling act approved May 2, 1932, putting into effect the revised convention, which was signed on May 9, 1930, and became effective May 9, 1931, follows:

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

#### SHORT TITLE

SECTION 1. That this Act may be cited as the Northern Pacific Halibut Act.

#### DEFINITION OF TERMS

SEC. 2. For the purposes of this Act "close season" shall mean the period from the 1st day of November in any year to the 15th day of February in the next following year, both days inclusive, unless this period or any part thereof shall be opened to fishing by regulation of the International Fisheries Commission, as empowered by the provisions of the Convention for the Preservation

of the Halibut Fishery of Northern Pacific Ocean and Bering Sea, signed on behalf of the United States of America and the Dominion of Canada, May 9, 1930, or any other close season hereafter established by the International Fisheries Commission in accordance with the provisions of that convention; "territorial waters of the United States" shall mean the waters contiguous to the western coast of the United States and the waters contiguous to the southern and western coasts of Alaska; "territorial waters of Canada" shall mean the waters contiguous to the western coast of Canada; and "convention waters" shall mean the territorial waters of the United States, the territorial waters of Canada, and the high seas, including Bering Sea, extending westerly from the limits of the territorial waters of the United States and of Canada.

FISHING UNLAWFUL; WHEN

SEC. 3. It shall be unlawful for any person to fish for, or catch, or attempt to catch, any halibut (Hippoglossus) at any time in any of the territorial waters of the United States closed to fishing under the provisions of the abovementioned convention or by any regulations adopted in pursuance thereof, or under the provisions of this Act, or for any national or inhabitant of the United States to fish for, or catch, or attempt to catch, any halibut at any time in any of the convention waters so closed to fishing, or to violate any regulations established pursuant to the authority of the convention. The unintentional catching of halibut, when legally fishing for other species of fish, shall not constitute a violation of this Act if such halibut shall be used for food by the crew of the vessel catching the same, or be landed and immediately delivered to any official duly authorized by the Secretary of Commerce of the United States to accept delivery, or delivered to the proper authorities of the Dominion of Canada The halibut delivered to any official of the United States pursuant to the provisions of this section shall be sold to the highest bidder for cash and the proceeds therefrom, exclusive of necessary expenses in connection therewith, shall be covered into the Treasury of the United States.

UNLAWFUL PORT USE; DEPARTURES

SEC. 4. No person, firm, or corporation shall use any port of or place in the United States to furnish, prepare, or outfit any vessel, boat, or other craft intended to be used in violation of the Convention for the Preservation of the Halibut Fishery or in violation of this Act, nor shall any person permit, or cause to be permitted, any vessel, boat, or other craft intended to be used in violation of the said convention or of this Act to depart from any port of or place in the United States.

UNLAWFUL PORT ENTRY; POSSESSION

SEC. 5. It shall be unlawful for any vessel, boat, or other craft having on board any halibut caught contrary to any of the provisions of the said convention or of this Act to enter any port or place in the United States, or for any vessel, boat, or other craft to enter any such port or place while upon or in the prosecution of any voyage during which the vessel, boat, or other craft fished or was used in fishing for halibut in convention waters closed to fishing. It shall be unlawful for any person knowingly to have in his possession in any port of or place in the United States or in any territorial water of the United States any halibut unlawfully caught under the provisions of the said convention or of this Act. It shall also be unlawful for any person to land in any port of or place in the United States halibut caught in convention waters during any period closed to fishing.

PENALTY

SEC. 6. Any person violating any of the provisions of the said convention or of this Act shall be fined not less than $100 or more than $1,000 or imprisoned not more than one year, or both.

PATROLS; SEARCHES

SEC. 7. The President shall cause a patrol of naval or other public vessels designated by him to be maintained in such places and waters as to him shall seem expedient for enforcing the said convention and this Act, and any officer of any vessel engaged in such service, and any other officers designated by the President, may stop, board, and search any vessel, boat, or other craft in the

territorial waters of the United States and any vessel, boat, or other craft of the United States on the high seas when suspected of having violated or being about to violate any of the provisions of the said convention or of this Act.

CANADIAN VESSELS AND NATIONALS

SEC. 8. Every national or inhabitant and every vessel, boat, or other craft of Canada found violating the said convention or this Act shall be delivered as soon as practicable to an authorized official of Canada at the nearest point to the place of seizure or elsewhere as the officials of the United States seizing the same and the authorized officials of Canada may agree upon, and the witnesses and proof necessary to the prosecution of said persons and vessels of Canada shall be furnished with reasonable promptitude to the authorities of Canada having jurisdiction thereof.

SEIZURE AND FORFEITURE

SEC. 9. Every vessel, boat, or craft, employed in any manner in violating any of the provisions of the said convention or of this Act shall be seized by any collector, surveyor, inspector, officer of a revenue cutter, or person specified in section 7 hereof, and except as provided in section 8 hereof, every such vessel, boat, or craft, including its tackle, apparel, furniture, cargo, and stores, shall be forfeited to the United States by proper proceedings in the district court of the United States, including the United States District Courts of Alaska, in the judicial district in which the violation is alleged to have occurred; or in the United States district court in the nearest judicial district within the United States, if the violation is alleged to have occurred outside the territorial waters of the United States.

FISHERIES COMMISSION EXEMPTION

SEC. 10. None of the inhibitions contained in this Act shall apply to the International Fisheries Commission when engaged in any scientific investigation.

DURATION OF ACT

SEC. 11. This Act shall take effect immediately and shall continue in force until the termination of the convention signed by the United States and the Dominion of Canada, on May 9, 1930, for the preservation of the halibut fishery of the northern Pacific Ocean and Bering Sea.

Approved, May 2, 1932.

## INTERNATIONAL PASSAMAQUODDY FISHERIES COMMISSION

The International Passamaquoddy Fisheries Commission appointed by the joint resolution of Congress approved June 9, 1930, completed its organization and vigorously prosecuted studies regarding oceanic circulation and the source and abundance of nutritive substances found in the sea water of the vicinity of Passamaquoddy Bay. Studies on the abundance of phytoplankton and zooplankton as a source of fish food in relation to the physical and chemical states of the water in the Bay of Fundy and along the coast of Maine were also prosecuted throughout the year.

Except for the loss of the first year's records on physical and chemical oceanography of the region in the disastrous fire of March 9, 1932, destroying the main laboratory building of the Atlantic Biological Station at St. Andrews, where the investigative staff maintained headquarters for part of the year, investigations have progressed satisfactorily. During the midwinter season laboratory facilities were provided at the Woods Hole Oceanographic Institution, Woods Hole, Mass. The bureau's motor ship *Pelican*, the *Prince* belonging to the Biological Board of Canada, and the chartered Canadian motor vessel *Nova IV* have been used in the investigational work.

## MULTILATERAL CONVENTION FOR THE CONSERVATION OF WHALES

Certain species of whales are practically extinct. The threatened extermination of other species chiefly hunted by modern whalers through the increasing intensity of whaling operations in practically all seas of the globe has aroused biologists in this country and abroad to the need for scientific study to determine control measures to prevent extinction and safeguard investments in this great industry. In September, 1927, the economic committee of the council was instructed by the assembly of the League of Nations, Geneva, Switzerland, to study the protection of marine fauna and to decide with the aid of experts " whether and in what terms, for what species and in what areas international protection of marine fauna could be established." The outcome of these studies culminated in the unanimous adoption of a draft convention for the regulation of whaling, the main object of which was to secure the adoption of certain rules to prevent the destruction of the whaling industry as a source of wealth by the greatest possible number of countries. On September 19, 1931, the convention was opened for signatures.

The convention will apply to all the waters of the world including both the high seas and territorial waters, except that any high contracting party may require a license of any vessel desirous of using its territorial waters subject to such provisions as may be deemed necessary or desirable, regardless of the nationality of the vessel. The convention will apply only to baleen or whalebone whales, including the finback, blueback, humpback, and right whales and not the toothed whales such as porpoises, dolphins, killer, and sperm whales. It will prohibit the taking or killing of right whales, which include North Cape whales, Greenland whales, southern right whales, Pacific right whales, and southern pygmy right whales. It also prohibits the killing of calves or suckling whales, immature whales, and female whales accompanied by calves or suckling whales.

The convention will require the fullest possible use of the carcasses of captured whales, including proper equipment for the extraction of the oil from all blubber and from the head and tongue, and at shore stations the use of all residues after the oil has been extracted. Vessels engaged in whaling must be licensed by the high contracting party whose flag they fly. Such vessels must furnish the most complete biological data practicable, including date and place of capture, species, sex, length, and other information. Each high contracting party shall obtain from all factories, on land or afloat, under its jurisdiction, returns of the number of whales of each species taken, the amounts of oil of each grade, and the quantities of meal, guano, and other products derived from them and shall communicate such data, including biological data, the name and tonnage of each floating factory, the number and aggregate tonnage of the whale catchers, and a list of the land stations in operation to the International Bureau for Whaling Statistics at Oslo, Norway, at convenient intervals, at least annually.

The convention shall enter into force on the thirtieth day following the receipt by the secretary general of the League of Nations of ratifications or accessions on behalf of not less than eight members of the league or nonmember states, including the Kingdom of Norway and the United Kingdom of Great Britain and Northern Ireland.

On March 31, 1932, the American Minister to Switzerland signed the convention on behalf of the United States, and on June 10, 1932, the United States Senate gave its advice and consent to the ratification by the President, who ratified the convention on June 17, 1932.

### NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS

The eighteenth meeting of the council was held in Ottawa, Ontario, on September 29 and 30, 1931, with representatives from Canada, Newfoundland, and the United States present. The council approved the following resolution:

> The North American Council desires to express its appreciation of the invitation from the International Council, conveyed by its president, that the North American Council should be regularly represented at its annual meetings. The North American Council resolves that hereafter, when possible, a representative will attend the meetings of the International Council in alternate years and hopes that representatives of that body may similarly attend the meetings of the North American Council. Many important problems are common to the two organizations and call for conjoint discussion and cooperation which may be facilitated by such an interchange of representatives.

The council also resolved that in view of the primary influence of water conditions upon the course of the various fisheries, it is desirable that all information relating to temperature or other conditions be communicated immediately to some center for purposes of collation and prompt reissue in such bulletin form as may be decided upon, the Woods Hole Oceanographical Institute being suggested as the best available clearing house for such data; and the chairman, as director of that institution, being requested to consider the matter of provision of the requisite facilities.

Views were exchanged on the progress of investigations as follows: Fishery statistics; cod, haddock, and mackerel investigations; drift bottle and water temperature experiments; and bait investigations. The council has issued a publication summarizing its history and developments.

### JAPANESE VESSELS IN BERING SEA

Crab-canning operations of a more or less experimental nature have been carried on by Japanese vessels in Bering Sea since 1930. In 1931 the floating cannery *Nagato Maru* spent approximately three months in the district, operating chiefly in the vicinity of Amak Island. This ship, with two auxiliary motor vessels, the *Kasuga Maru* and *Ise Maru*, returned in 1932 to engage in the packing of crabs in Bering Sea waters to the north of the Alaska Peninsula. In addition to the *Nagato Maru*, the trawler *Kokusai Maru* was in the Bering Sea region for several weeks in 1931 and made stops at a number of places in the Aleutian Islands, primarily in connection with a proposed good-will flight of Japanese aviators to this country.

## DOMESTIC RELATIONS

### FISHERIES OF THE VIRGIN ISLANDS AND PUERTO RICO

The Commissioner's report for last year referred to the investigations of the fisheries of the Virgin Islands and Puerto Rico, begun in May, 1931, which were completed in November. The islands are

not self-supporting in regard to fishery products. For instance, while the Virgin Islands produced a little over 600,000 pounds of fishery products in 1930, during the same year they imported about an equal amount of fish, consisting largely of dry salt cod. The catch in 1930 in Puerto Rico amounted to over 3,000,000 pounds, and in the same year about 21,500,000 pounds of fishery products, consisting also largely of dry salt cod, were imported.

While the fisheries of these islands can not be expanded indefinitely, it is believed that they can be increased to a point where imports can be lowered to a minimum. A large variety of fish is found around the islands, and with present methods twice the present catch can undoubtedly be taken around the Virgin Islands and the catch of Puerto Rico also can be increased considerably. As the inhabitants of the islands undoubtedly could not consume the entire catch in a fresh state as taken, the bureau conducted studies toward developing methods for preserving the catch for future use. Two methods of accomplishing this appeared feasible: (1) Through the introduction of improved methods of handling and the use of ice and refrigeration; (2) by the development of a local fish-curing industry, thus providing a product to replace imported cured fish.

It was demonstrated that fresh fish products superior to any then marketed with a greatly extended period of preservation could be prepared, and a method was developed by which a dry-salt fish of good quality could be prepared. It was found possible to cure most of the larger food fish, barracuda being the most satisfactory. Small fish could be smoked satisfactorily, thus increasing the demand for these fish now in little demand. Inhabitants were instructed in the proper handling and refrigeration of fresh fish and in curing fish.

### COOPERATION WITH THE STATES AND OTHER AGENCIES

Cooperation with other agencies was conducted on an unprecedented scale, greatly extending the bureau's sphere of usefulness with resultant economies in the cost of operation of the bureau and other governmental services.

In the field of biological investigations the Conservation Department of the State of New York is providing financial support for studies on nutrition of trout at Cortland, N. Y., in cooperation with the College of Agriculture, Cornell University; a limited amount for pond-culture work at Rochester, N. Y., where some 20 acres of ponds and lakes are already under cultivation; and a substantial sum toward the publication of a scientific paper dealing with life-history studies of the fishes of Lake Erie. Wisconsin and Michigan authorities have taken an active part in studies of the destruction of immature fish by fishing gear in Lake Michigan, contributing funds for the operation of the bureau's vessel *Fulmar*. Louisiana and Texas have contributed personnel and other assistance in furthering the shrimp investigations. California is meeting half the costs of investigations of trout and oysters. North and South Carolina, Georgia, and Florida have contributed to the oyster cultural research program in that area. Connecticut authorities have made available a field laboratory and the State shell-fisheries research vessel for oyster investigations in the Long Island Sound area. A field laboratory for oyster research in Puget Sound, near Olympia, is also being provided by the State of Washington.

More than 15 States have cooperated with the bureau in fish-cultural work. This aid includes the joint operation of hatcheries, aid in collection of eggs, and exchange or transfer of eggs to meet demands which could not otherwise be fulfilled. In the Rocky Mountain section a program of investigation of waters in the national forests has been developed to formulate an adequate stocking and rearing policy along scientific lines. Similar investigations are being conducted in the Yellowstone, Teton, and Glacier National Parks. The Bureau of Indian Affairs has aided in the collection of trout eggs on the Pyramid Lake Reservation. In cooperation with the Bureau of Reclamation attempts are being made to develop a program for the protection of fisheries which may be affected by irrigation and reclamation projects under Federal control. As a basic industry the fisheries should be accorded proper consideration and treatment. Reference is made elsewhere to the extensive cooperation with private sportsmen's organizations in the rearing of fish to fingerling or adult size for stocking purposes.

The Pacific and Great Lakes States have been particularly helpful in the collection of fishery statistics. More recently Maryland and Virginia have installed more complete systems for the collection of such data. Last year many of the States in the Mississippi River section contributed personnel to aid in the canvass of that area. In this as in many of its activities the bureau represents the correlating agency, performing necessary service beyond the scope of the individual States.

The bureau's technological program has been materially broadened by cooperation with other agencies. At the South Carolina Food Research Commission one of its investigators is studying the anti-anæmic properties of oysters in collaboration with investigators at that institution. The bureau is also cooperating with the Ohio State Agricultural Experiment Station, Wooster, Ohio, and the North Carolina State Agricultural Experiment Station, Raleigh, N. C., in the feeding of fishery products to farm animals. In cooperation with the United States Department of Agriculture and producers of kelp meal, nutritive studies of kelp meal are in progress. At Gloucester, Mass., local fishing interests are making material contributions to the maintenance of the bureau's technological laboratory located in that city in providing laboratory space without cost to the Government.

In Alaska during the past calendar year the bureau transported more than 50 employees of other Government agencies on its vessels and in many other ways it has rendered service to Federal and Territorial representatives in that section.

## FIVE-YEAR CONSTRUCTION PROGRAM

Under the authorization of the act of May 21, 1930 (46 Stat. 371), appropriations for augmenting of the bureau's fish-cultural facilities in the amount of $448,500 were made available for the continuation of projects previously initiated and for the inception of several new ones. There were placed in operation during the year the new experimental hatchery in West Virginia and a sorely needed bass hatchery in New Mexico. The establishment at Natchitoches, La., was largely completed but not placed in operation. Development work at a substation near Leadville, Colo., and a hatchery in central

Tennessee were pushed during the year and carried well on toward completion. At the close of the year construction at Lake Mills, Wis., and in the Madison Valley, Mont., was just being started, and a site had been acquired in Idaho for a large trout hatchery. In addition, a hatchery in southwestern Oregon was under construction. Negotiations for the purchase of a location at Cortland, N. Y., were not fully completed at the close of the year, as was the case at the Mill Creek (Calif.) station now operated under a lease. Preliminary development of a bass hatchery on a newly acquired site in Alabama was also started. Sites in Indiana and Pennsylvania have been acquired, but as no funds were appropriated for the continuation of the construction program in 1933, no further developments will be possible. A location for a substation in Texas was selected and will be acquired, although this project likewise lacks appropriations for construction. As an auxiliary to the propagation of salmon in the Puget Sound region, there is being constructed a game-fish hatchery adjoining Mount Rainier National Park to be devoted exclusively to the stocking of the park and surrounding waters.

### BUREAU'S NEW HEADQUARTERS

After more than 50 years of occupancy of the old Armory Building at Sixth and B Streets SW., on January 1, 1932, the bureau moved into its quarters in the new Commerce Building between Fourteenth and Fifteenth Streets, south of Pennsylvania Avenue. Its new quarters include limited laboratory facilities for research in various fields of fisheries, biology, and technology, and an attractive aquarium in the basement of 47 tanks and 3 floor pools with a capacity several times that afforded in its former quarters.

## ALASKA FISHERIES SERVICE

### ADMINISTRATION OF FISHERY LAWS AND REGULATIONS

An effective policy for the conservation of the fisheries of Alaska has been continued under the White law of June 6, 1924, which gives the Secretary of Commerce plenary power to regulate commercial fishing. Close attention was given to the study of the salmon for the purpose of regulating fishery operations to assure an ample escapement of brood fish for maintaining the runs without impairment. The Commissioner of Fisheries was in Alaska for several weeks during the active fishing season giving personal attention to this matter.

A generally normal run of salmon occurred in Alaska in 1931, but there was marked voluntary curtailment of fishery operations because of economic conditions.

Revised regulations for the protection of the fisheries of Alaska were approved by the Secretary of Commerce on December 17, 1931, and became effective January 1, 1932. The generally satisfactory condition of the fisheries made unnecessary any drastic modification of the regulations.

In protecting and conserving the Alaska fisheries, an effective patrol of the fishing grounds to prevent violations of the regulations was maintained. In addition to 12 statutory employees and the 53

persons on the bureau's fleet of 15 vessels, 220 men were employed as stream guards and special workmen in 1931. In addition, 9 chartered vessels were used, and there was also limited aerial patrol service.

The work of maintaining the salmon runs at the maximum productivity was aided materially by the removal of obstructions hindering the free passage of salmon to the spawning grounds and by the destruction of predatory enemies. The latter work was carried on in cooperation with the Territory, chiefly in the Bristol Bay region, and has proved to be not only of great value to the salmon fishery but also has provided an important source of income for local residents.

### ALASKA SALMON HATCHERIES

At the Government hatcheries at Afognak and on McDonald Lake 48,055,000 red-salmon eggs, 353,000 pink-salmon eggs, 33,000 steelhead-trout eggs, and 2,731,000 Dolly Varden trout eggs were collected in 1931. The Dolly Varden trout eggs and 3,145,000 red-salmon eggs in the eyed stage were shipped to Seattle for distribution. One privately owned hatchery, operated under the provisions of the Alaska fisheries act of June 26, 1906, collected 20,280,000 red-salmon eggs.

### PRODUCTS OF THE FISHERIES

The yield of the Alaska fisheries in 1931, curtailed considerably because of economic conditions, showed a decrease of approximately 7 per cent in quantity and 11 per cent in value, as compared with figures for the preceding year. The decline occurred chiefly in herring and halibut products and in the total suspension of whaling operations.

Salmon products comprised about 79 per cent in quantity and 91 per cent in value of the total output of the Alaska fisheries in 1931. Nearly 95 per cent of the salmon production consisted of canned salmon, the pack amounting to 5,403,739 cases, or 259,379,472 pounds, valued at $29,096,292. As compared with the pack of the preceding year, the output of canned salmon in 1931 showed an increase of 7 per cent in quantity but a decrease of 2 per cent in value. The number of canneries operated dropped from 149 in 1930 to 116 in 1931.

The total output of Alaska fisheries products in 1931 was 345,435,388 pounds, valued at $33,594,752, as compared with an average of 377,905,159 pounds, valued at $47,570,728, for the 5-year period from 1926 to 1930, inclusive. The value of the 1931 catch to the fishermen was approximately $10,043,000, or about $2,242,000 less than in the preceding year. There were 22,577 persons employed in the various branches of the industry, as against 27,568 in 1930.

## ALASKA FUR-SEAL SERVICE

### GENERAL ACTIVITIES

Under international cooperation secured by the North Pacific Sealing Convention of July 7, 1911, whereby the killing of fur seals on the high seas of the North Pacific is prohibited, the fur-seal herd

which has its breeding grounds on the Pribilof Islands in Bering Sea has changed from a state of threatened extinction to a well-developed economic resource. During the 21 years in which the treaty has been in effect the herd has steadily increased, and about 50,000 surplus 3-year-old male seals are now taken annually.

Progress was made in the construction program, particularly regarding facilities for the handling of increased takes of sealskins. On St. Paul Island work was continued on the East Landing wharf, a garage for trucks and other motive equipment was built, a new pump house was erected and equipment installed to provide an additional water supply for the washing of sealskins, and the construction of a new Government house and a community hall was begun. Some extension of improved roads was accomplished on both islands.

Through cooperation of the Navy Department the annual supplies for the Pribilof Islands were transported from Seattle, Wash., on the U. S. S. *Vega*, and the season's take of sealskins was brought to Seattle by that vessel. Valuable assistance was rendered also by the United States Coast Guard in patrolling waters frequented by the fur seals and in performing other services in connection with the bureau's administration of affairs at the islands.

The Commissioner of Fisheries visited the Probilof Islands in July to observe the progress of sealing activities.

### SEAL HERD

The computed number of animals in the Pribilof Islands fur-seal herd on August 10, 1931, was 1,127,082, an increase of 81,981, or 7.84 per cent, over the corresponding figure for 1930.

### TAKE OF SEALSKINS

In the calendar year 1931 there were taken on the Pribilof Islands 49,524 fur-seal skins, of which 39,964 were from St. Paul Island and 9,560 from St. George Island. This was an increase of 7,024 over the number taken in 1930.

### MARKING RESERVED SEALS

In 1931 there were marked and reserved for future breeding stock 5,226 3-year-old male seals, of which 3,570 were on St. Paul Island and 1,656 on St. George Island. The reserve includes also a large number of seals of this age class that were not taken in the drives.

### SALE OF SEALSKINS

Three public auction sales of fur-seal skins taken on the Pribilof Islands were held in the fiscal year 1932, the first two being at St. Louis, Mo., and the third at New York City. On August 24, 1931, there were sold 9,125 black-dyed and 6,000 logwood brown-dyed skins at a gross price of $282,642.75.

The sale on October 19, 1931, consisted of 5,535 black-dyed and 3,980 logwood brown-dyed skins, which brought a total of $153,938.50. At the same time there were sold 32 confiscated fur-seal skins, raw, for $15.25, and 2 confiscated sea-otter skins for $430.

At the sale on June 13, 1932, 3,788 black-dyed and 3,448 brown-dyed skins brought $102,328.05. A number of skins were withdrawn from the sale.

Special sales of sealskins authorized by the Secretary of Commerce in the fiscal year 1932 consisted of 150 black-dyed, 150 brown-dyed, and 5 exhibition skins, which sold for a gross price of $7,309.90. All were taken at the Pribilof Islands. These special sales included 150 skins that were sent to Paris and manufactured into 19 coats, which were returned to this country and used for advertising purposes.

### FOXES

The management of herds of blue foxes on St. Paul and St. George Islands provides employment for the natives when sealing activities are at a minimum and is a source of additional revenue to the Government.

The 889 blue and 26 white fox skins taken in the 1930–31 season were sold at public auction in the fiscal year 1932. The blue pelts brought $19,559.50 and the whites $466, a total of $20,025.50.

In the season of 1931–32, 289 blue and 25 white fox skins were taken on St. Paul Island and 1,112 blue fox skins on St. George Island, a total of 1,426 skins. Of the blue foxes that were trapped, 37 on St. Paul Island and 432 on St. George Island were marked and released for breeding purposes.

### FUR-SEAL SKINS TAKEN BY NATIVES

The North Pacific Sealing Convention of 1911 provides that aborigines of the Pacific coast may, under certain restrictions, take fur seals at sea. Before the skins of such animals may enter into commerce they must be authenticated as having been lawfully taken. In 1931 there were authenticated by officials of the respective Governments 1,649 fur-seal skins, of which 21 were taken by natives of southeast Alaska, 165 by natives of Washington, and 1,463 by natives of British Columbia.

### FUR-SEAL PATROL

A patrol for the protection of the fur-seal herd was maintained by vessels of the United States Coast Guard. Two vessels of the Bureau of Fisheries participated in this work in the spring, the *Widgeon* in southeast Alaska and the *Brant* off the coast of Washington.

### PROTECTION OF SEA OTTERS, WALRUSES, AND SEA LIONS

Revised regulations for the protection of walruses and sea lions were issued as of May 1, 1932, extending the closed season on these animals for another 2-year period, while permitting, as heretofore, certain limited killing under specified conditions. The killing of sea otters is prohibited at all times.

## PROPAGATION AND DISTRIBUTION OF FOOD AND GAME FISHES

The hatchery organization operated under the supervision of the division of fish culture of the bureau was responsible for the distribution of 7,073,935,200 fish and eggs during the fiscal year. This

represents a moderate decrease from the output of the previous year when 7,121,806,000 fish and eggs were produced. Part of the decline is chargeable to a marked reduction in the number of fish handled in the rescue work on the upper Mississippi River area. A survey of the more than 45 individual species handled indicates that certain well-defined groups suffered a slight reduction in addition to the category mentioned above. Practically all of the Pacific salmons were handled in smaller numbers. Important commercial fishes of the Great Lakes, specifically, the whitefish, cisco, and lake trout, also showed a decline in production. A large number of trout was distributed, and in the group of marine fishes the cod and haddock showed an increase, while the pollock and winter flounder, which normally represent over half of the total output, declined by approximately one-half billion. Analysis further shows that the production of fingerling fish, which represents those forms which have attained a size ranging from several inches up to the legal length, was also quite sharply curtailed, with an output of 148,000,000 as compared with 320,000,000 for the previous fiscal year. This is to a large extent accounted for, however, by the decline of 120,000,000 in the class of rescued fishes which normally represents a large proportion of the fingerling output. It should be further pointed out that in the majority of instances where a decline occurred the eggs are secured from commercial fisheries and are not produced at the hatcheries as is the case with trouts and other game varieties. Therefore, the collection of eggs and the consequent output of fish is largely controlled by conditions which the bureau can not modify, particularly weather and market conditions, and it is not unusual for considerable fluctuations in the output of the commercial species to occur from year to year.

There follows analysis of the total production broken down to show the output by certain species and groups classified according to their relationships:

| | Number |
|---|---|
| Game fishes: | |
| Warm-water species— | |
| Basses | 4, 685, 000 |
| Sunfish | 10, 357, 200 |
| Crappie | 6, 951, 000 |
| Pike and pickerel | 59, 000 |
| Catfish | 12, 185, 000 |
| White perch | 7, 000, 300 |
| White bass | 16, 700 |
| Other | 542, 300 |
| Total | 41, 796, 500 |
| Cold-water species— | |
| Trouts— | |
| Brook | 17, 898, 000 |
| Rainbow | 13, 953, 000 |
| Loch Leven | 23, 143, 000 |
| Black-spotted | 17, 178, 000 |
| Golden | 50, 100 |
| Dolly Varden | 2, 462, 000 |
| Grayling | 41, 100 |
| Landlocked salmon | 986, 700 |
| Total | 75, 711, 900 |
| Commercial fishes: | |
| Anadromous species— | |
| Shad | 29, 758, 000 |
| Glut herring | 55, 000, 000 |
| Striped bass | 1, 676, 000 |
| Commercial fishes—Con. | |
| Anadromous species—Con. | |
| Salmon: | Number |
| Atlantic | 1, 143, 700 |
| Pacific | 134, 774, 100 |
| Total | 222, 351, 800 |
| Interior waters (including Great Lakes) species— | |
| Whitefish | 69, 880, 000 |
| Cisco | 23, 000, 000 |
| Lake trout | 25, 630, 300 |
| Pike perch | 401, 604, 000 |
| Yellow perch | 182, 276, 700 |
| Carp | 247, 421, 000 |
| Buffalofish | 255, 856, 000 |
| Total | 1, 205, 668, 000 |
| Marine species— | |
| Cod | 1, 628, 766, 000 |
| Haddock | 800, 151, 000 |
| Pollock | 14, 670, 000 |
| Winter flounder | 3, 049, 124, 000 |
| Mackerel | 15, 245, 000 |
| Total | 5, 507, 956, 000 |
| Miscellaneous fishes | 20, 451, 000 |
| Grand total | 7, 078, 935, 200 |

## PROPAGATION OF COMMERCIAL SPECIES

*Marine species of the Atlantic coast.*—While haddock and cod were handled in larger numbers, a very poor market for pollock materially curtailed the output of this species from the Gloucester (Mass.) station. Furthermore, a decline of approximately 500,000,000 fry of the winter flounder was registered in the operations of the Boothbay Harbor (Me.) and Woods Hole (Mass.) stations.

*Pacific salmon.*—With the exception of the chum salmon and the steelhead salmon, the output of all the varieties of commercial Pacific salmons registered a decline. Propagation of these forms is especially dependent upon the abundance of the run of fish, and since these runs fluctuate according to year classes, the hatchery production is likewise variable.

*Anadromous species of the Atlantic coast.*—Included in this group are certain commercial forms comprising the shad, striped bass, Atlantic salmon, and glut herring. The shad work is chiefly centered on the Potomac River, and in this field a considerable increase in output was achieved. The propagation of striped bass in cooperation with the State of North Carolina did not yield results of any great importance during 1932. The propagation of Atlantic salmon is dependent upon the quantity of eggs which may be obtained from the Canadian Government, since they are not readily available in the United States. A noticeable reduction in the egg supply was, of course, reflected in a curtailed output of the fingerling salmon.

*Commercial species of interior waters.*—While the most important groups in this field comprise the whitefish, lake trout, cisco, and pike perch of the Great Lakes, the buffalofish and carp are handled to a considerable extent, the work being chiefly confined to the fertilization and planting of the eggs on the normal spawning grounds rather than any incubation in the hatcheries. The number of eggs of the two latter varieties handled was materially increased, but in the case of the Great Lakes species, with the exception of the pike perch, results were disappointing. The unusually mild weather extending into the early winter greatly retarded the spawning and rendered such eggs as were secured of rather poor quality. The work on Lake Ontario carried on from the Cape Vincent (N. Y.) station suffered most materially from these conditions. However, during the spring months there was a phenomenal run of pike perch which resulted in a stock of eggs to the full capacity of not only the bureau's hatcheries but all the State hatcheries handling this variety.

## PROPAGATION OF GAME FISHES

While a considerable number of game fishes are handled in rescue operations, the majority of these species are produced at the bureau's own hatcheries, limited only by the space and funds available, and it is therefore possible to exercise much greater control over the output. As a result of this, almost all of the most important forms, including the trouts, landlocked salmon, and the largemouth and smallmouth bass were distributed in greater numbers to keep pace with an increase in the number of applications which are reaching new high totals each year. Since only two new hatcheries were actually placed in operation during the year, the increase is largely

attributable to more efficient methods and in few instances to more favorable weather and water conditions.

In connection with this work there is carried on a cooperative rearing pond system under which sportsmen's organizations receive fish from Federal hatcheries and retain them for feeding and rearing in ponds or, in several instances, complete hatchery units owned, developed, and maintained by the cooperating organization. Apparently economic conditions curtailed the funds which sportsmen could spend for this work and a smaller number of organizations to which a smaller number of fish were allotted cooperated with the bureau during the fiscal year 1932.

### RESCUE OPERATIONS

The salvage of fishes stranded in the overflowed areas of the upper Mississippi River, principally in the Upper Mississippi Wild Life and Fish Refuge, was conducted on a much restricted basis during 1932. This was because water conditions rendered salvage work impracticable or unnecessary to a considerable degree, with the result that the collections of 51,611,367 represent less than one-third of the figures for the previous record year.

## STATISTICAL SURVEYS

### FISHERIES OF THE UNITED STATES, 1930

*New England States.*—During 1930 the fisheries of Maine, New Hampshire, Massachusetts, Connecticut, and Rhode Island employed 17,077 fishermen, or a decrease of less than one-half of 1 per cent under 1929. The catch amounted to 701,350,979 pounds, valued at $27,493,479—an increase of 1 per cent in the catch, but a decrease of 5 per cent in value as compared with 1929. Landings of fish by American vessels at Boston and Gloucester, Mass., and Portland, Me., amounted to 350,801,470 pounds as landed, valued at $12,785,452—an increase of 7 per cent in volume over 1929.

*Middle Atlantic States.*—During 1930 the fisheries of New York, New Jersey, Pennsylvania, and Delaware employed 10,605 fishermen, or 1 per cent more than in 1929. The catch amounted to 193,867,981 pounds, valued at $13,063,672—an increase of 2 per cent in the catch, but a decrease of 8 per cent in its value as compared with 1929. Landings of fish at New York City and Groton, Conn., amounted to 57,255,000 pounds, or 24 per cent less than in 1929. On the Hudson River the shad fishery was carried on by 243 fishermen who caught 206,504 pounds of shad, valued at $33,372—a slight increase over 1929.

*Chesapeake Bay States.*—In the calendar year 1930 the fisheries of Maryland and Virginia employed 19,391 fishermen, or 5 per cent more than in 1929. The catch amounted to 316,392,924 pounds, valued at $11,472,050—an increase of 15 per cent in the catch, but a decrease of 1 per cent in its value as compared with the previous year. The shad and alewife fisheries of the Potomac River were prosecuted by 608 fishermen, who caught 601,193 pounds of shad, valued at $98,041, and 3,114,918 pounds of alewives, valued at $49,315.

*South Atlantic and Gulf States.*—During 1930 the fisheries of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas employed 23,590 fishermen, or 11 per cent less than in the previous year. The catch amounted to 417,759,466 pounds, valued at $11,064,819—a decrease of 22 per cent in the catch and 26 per cent in its value as compared with 1929.

*Pacific Coast States.*—In the calendar year 1930 the fisheries of Washington, Oregon, and California employed 19,574 fishermen or 2 per cent less than in 1929. The catch amounted to 833,388,643 pounds, valued at $23,064,140—a decrease of 19 per cent in the catch and 8 per cent in its value as compared with 1929. The total catch of halibut by United States and Canadian vessels amounted to 49,408,000 pounds, valued at $4,974,000—a decrease of 11 per cent in quantity and 26 per cent in value as compared with 1929.

*Lake States.*—During 1930 the lake fisheries (Lakes Ontario, Erie, Huron, Michigan, Superior, and Namakan and Lake of the Woods and Rainy Lake) of the United States and Canada produced 121,532,395 pounds of fish and shellfish. Of the total, the United States accounted for 94,947,642 pounds, valued at $6,050,267. There was an increase in the catch, but a decrease in its value as compared with that in the previous year.

*Mississippi River and tributaries.*—During the calendar year 1930 the catch of fresh-water mussel shells amounted to 59,490,000 pounds, valued at $1,092,156—an increase of 9 per cent in the quantity and a decrease of 18 per cent in the value as compared with 1929. The fisheries of Lakes Pepin and Keokuk decreased as compared with 1929.

## MANUFACTURED PRODUCTS IN THE UNITED STATES AND ALASKA, 1930

The total value of manufactured fishery products in the United States and Alaska in 1930 amounted to about $170,000,000. This includes cured products and by-products manufactured in the States of the Mississippi Valley which are not included in the following discussions of groups of products.

*Fresh and frozen packaged products.*—The production of fresh and frozen packaged fish and shellfish in 1930 amounted to 157,378,368 pounds, valued at $28,996,454. The most important items were fresh-shucked oysters, amounting to 5,502,723 gallons, valued at $10,346,848, and fresh and frozen haddock fillets, amounting to 63,701,659 pounds, valued at $9,997,855.

*Cured products.*—During 1930 the output of cured fishery products (salted, spiced, smoked, and dried) amounted to 124,496,656 pounds, valued at $16,837,406—an increase of 2 per cent in amount, but a decrease of 10 per cent in value as compared with 1929. Important products were mild-cured salmon, 10,157,175 pounds, valued at $2,065,553 and salted cod, 18,571,452 pounds, valued at $1,464,774.

*Canned products.*—Canned fishery products produced during 1930 amounted to 577,782,585 pounds, valued at $83,015,055, or a decrease of 18 per cent in the value as compared with 1929. Canned salmon amounting to 6,086,479 standard cases (292,150,992 pounds), valued at $42,828,172, was most important. Other important products were sardines, tuna and tunalike fishes, shrimp, clam products, and oysters.

*By-products.*—During 1930 the production of fishery by-products in the marine and lakes sections amounted to $19,559,856. There was a considerable decrease compared with 1929. Important products in this group were marine-animal meals and scrap, pearl and oyster-shell products, and marine-animal oils.

*Frozen products.*—The pack of frozen fishery products in 1930 amounted to 139,297,000 pounds, which had an estimated value of $16,500,000. The volume of the pack was 15 per cent greater than in 1929. The more important products in the group with respect to volume were haddock fillets, 19,270,819 pounds; salmon, 15,991,896 pounds; and halibut, 13,588,630 pounds.

### SOME UNUSUAL MARKETS FOR FISH AND SHELLFISH

In an effort to expand the consumption of fishery products, the bureau surveyed and reported upon several unusual outlets for these products. This included the newly established commercial sport-fishing industry which numbers more than 40 firms in the country with an investment in excess of $500,000 and the development of a hot-fish shops industry.

## TECHNOLOGICAL INVESTIGATIONS

### NUTRITIVE VALUE OF MARINE PRODUCTS

In cooperation with and in the laboratories of the Bureau of Chemistry and Soils, the bureau's technologists completed an investigation in which it was shown that commercially produced burbot-liver oils were from four to ten times as potent in vitamin A and from three to four times as potent in vitamin D as medicinal cod-liver oil. It also was shown that burbot-liver oil meets the United States Pharmaceutical X requirements for cod-liver oil with respect to specific gravity, iodine number, acid value, and unsaponifiable matter. This work should be of value in promoting a burbot-liver oil industry on the Great Lakes and thereby find a market for a by-product from a fish little used, but which can be taken in larger quantities than at present.

As a result of experiments conducted by the bureau in cooperation with a producer of kelp meal, it has been found that kelp meal is a valuable supplement to corn gluten meal, cottonseed meal, and linseed oil meal in the rations of animals. Kelp meal is also a good source of vitamin A, containing about one-fourth as much as alfalfa hay, approximately the same amount as fresh eggs, and one and one-half times as much of this vitamin as yellow corn. Further experiments showed that kelp meal stimulates appetite, and therefore is an important factor in increasing both growth and food consumption, thus shortening the period of production of animals for early market maturity.

Studies by this bureau, in cooperation with the Bureau of Chemistry and Soils, have revealed that fish flour, produced from edible filleting waste, is an extremely valuable source of minerals, such as calcium and phosphorus, particularly for growing children, and that fish flour can be incorporated in bakery products, making a palatable and nutritious food.

### PRESERVATION OF FISHERY PRODUCTS FOR FOOD

Studies on the preservation of fishery products for food are being directed toward developing standard simplified chemical methods for determining the condition of the flesh of fish as to freshness, age, or stage of decomposition. In addition, efforts are being devoted to establishing a standard procedure for smoking fish whereby a product of uniformly high quality can be prepared. For the latter purpose an experimental smokehouse, which is capable of controlling temperature, humidity, volume of smoke, and other variable factors encountered in smoking fish, has been built by the technologists of this bureau. Laboratory tests of smoking fish in this apparatus have shown that a product of uniform high quality can be prepared.

### BACTERIOLOGY OF FISH PRESERVATION

Bacteria play an important rôle in the handling, preservation, and storage of fishery products. In order to learn the effect of this rôle on commercial practice and also to aid with other technological research, the bureau during the past year installed a bacteriological unit in its Gloucester laboratory. Research to date has consisted in determining the germicidal effect of smoke on fish, the nature of molds on smoked fish and their prevention, and the bacteriology of fresh and frozen fish.

### PRESERVATION OF FISHERY BY-PRODUCTS

With the installation of a by-products unit as a part of the technological laboratory at Gloucester, Mass., four by-products investigations of pressing interest to the fishing industry were inaugurated.

Studies on improved methods of manufacturing fish meal from nonoily fish waste have indicated that high temperatures or lengthy drying periods are detrimental to the finished product. Inasmuch as elimination of one ordinarily results in the increase of the other, a distinct advantage may be expected from the determination of an optimum condition.

The problems associated with the manufacture of fish flour from fillet waste are similar to those associated with the fish-meal work, except that more refined methods are permissible and must be applied in preparing a product for human consumption. One of the main problems in this connection is to obtain an extremely rapid removal of moisture at low temperature. The initial work on this problem, therefore, has been the development of an apparatus which will disperse fish material in a drying medium so that extremely rapid drying can be effected.

Studies on haddock-liver oils have shown that this oil varies in its natural chemical, physical, and biological properties according to season and habitat of the fish.

Studies on improving the technical usefulness of fish oils are expected to point out when fish oils, owing to their natural variation, are most nearly fitted for the many uses which can be made of them.

### NET PRESERVATION

As a result of continued research on net preservation and field observation in many varied commercial waters, it has been found that the life of twine used in heavy gear, such as traps and seines, can be materially extended by applying toxic dyes to the cotton before the twine is made, followed by the proper application to the finished net of coal tar, prepared within test limits developed by this bureau. Several concerns are now prepared to furnish special dyed twine and also specification tar as recommended by the bureau.

For the preservation of light gear, such as gill nets, thorough cleansing of the net is of the most importance in extending its life, while storage by suspension in dry shade is of secondary importance. Chemical preservatives are apparently of minor value.

## BIOLOGICAL FISHERY INVESTIGATIONS

Although the biological researches of the scientific staff of the division of inquiry respecting food fishes are often regarded as having primary value to conservation as a basis for the regulation or prevention of overfishing by State legislation, they have equal value to the Nation through encouraging the wise use of our aquatic resources. They offer direct aid to industry by providing exact information regarding the source of supply for the commercial fisheries and in some cases predict years of unusual abundance or scarcity; they aid the water farmer by devising and demonstrating improved methods of fish and shellfish culture. These investigations are organized under responsible heads in each of the major geographical areas of the United States where local field headquarters or laboratories are maintained, in many cases in space provided by universities. The problems of the fisheries of the Nation are therefore considered as units.

### FISHERIES OF THE ATLANTIC AND GULF COASTS

Investigations on the changing abundance of the important food fishes of the Atlantic coast have been expanded during the past year by the development of the studies of the haddock supply initiated during 1930. This fishery has experienced a serious decline in yield per unit of effort during the past few years following a period of exceptional production. On the fishing grounds, principally Georges Bank and South Channel, where the bulk of the United States landings have originated, the abundance of haddock increased markedly from 1924 to a maximum in 1927. Since then the supply has fallen off sharply to a level in 1930 far below that in 1924 and has continued to decline during 1931.

By combining with the statistical analysis of the yield per unit of effort a study of the biology of the haddock stock, primarily size and age composition, growth rate, and distribution, it appears that an extraordinarily successful natural production of haddock occurred between 1920 and 1922. In 1925 the full effect of these abundant year groups was reflected in increased landings of scrod sizes, which in the following two years had grown sufficiently to be included as large haddock resulting in a continuing increase in abundance until the peak was reached in 1927. Since that year the catch statistics do

not indicate the production of any year class at all comparable to those of the earlier period.

Work carried on during the past year both at sea and on shore has shown that there is now present on the banks a group of small haddock forming the most numerous year class which has appeared during the past several years. It is anticipated that as this abundant group grows in size the landings of scrod will increase and during 1932 and 1933 a proportional increase in the landings of large haddock should occur. With favorable market conditions therefore the outlook for a more successful haddock fishery is bright.

A continued study of fluctuations in the mackerel fishery is also producing results that should be of great value to the industry. By studying the condition and trend of this fishery, which yielded 64,000,000 pounds in 1929, it is possible not only to discover depletion, should it occur, before it becomes disastrous to the industry but also to issue predictions of future yields which permit an adjustment of distributing facilities and expenditures for production and prevent to some extent the demoralizing effects of glutted markets. As a result of such studies a prediction was issued in May at the beginning of the mackerel season which estimated the quantities of mackerel in the sea to be sufficient to yield 26,000,000 pounds of commercial size exclusive of 1931 tinkers, providing the same number of vessels operated with the same intensity of fishing as during the last year. The prediction of the previous year of 35,300,000 pounds exclusive of 1930 tinkers was surprisingly close. The actual yield of the sizes of fish considered was 32,164,000 pounds, while the total catch for the season was approximately 36,472,000 pounds.

In order to provide a more complete understanding of the causes of fluctuations in abundance, observations on the spawning grounds from Cape Cod to North Carolina were continued. Oceanographic observations were made on ocean drifts, on the abundance of eggs and larvæ of the mackerel, and experimental studies on the rate of development of mackerel eggs under varying conditions of temperature were carried out.

Limited observations on the migrations of the cod by means of tagging experiments confirmed and extended previously published conclusions. Similar studies were also conducted on the important shore fishes of the Middle Atlantic States, including the squeteague or weakfish, scup, butterfish, sea bass, and summer flounder. The relationship of production areas from Chesapeake Bay northward has been demonstrated and variations in the supply of these important fishes are now believed to follow the same principle of dominant year classes demonstrated for the haddock and mackerel. During the past two years commercial trawlers have located and are exploiting these species on their winter feeding grounds off the Virginia capes. A study of the migrations and varying abundance of these species is being extended to include the offshore areas in order to determine what the probable effect will be of the winter drain upon the supply which heretofore has been exploited only in the summer seasons.

Investigations of fishery problems in the South Atlantic and Gulf include the shrimp fishery from North Carolina to Texas, oyster culture in the coastal area from North Carolina to Florida, and

ichthyological studies of the fish fauna of the Gulf coast. The biological problems presented by the shrimp, which is supporting a rapidly growing commercial fishery of vast proportion, are proving particularly difficult of solution. The bureau's investigators are, nevertheless, making progress in understanding the life history of the three important species of shrimp. Although it would be premature even to outline the life history of these species, there can be little doubt that the life span is short and that most of the fishery draws upon dangerously young or spawning individuals. Under these circumstances depletion, should it appear, may run a tragically rapid course, a condition which emphasizes the importance of providing reasonable protection to this valuable animal.

With a change of personnel at the Fisheries Biological Laboratory, Beaufort, N. C., emphasis has been placed upon studies in shellfish culture in the Southern States. Experimental oyster beds have been established at various points from North Carolina to Florida where the improved methods of culture developed in northern waters will be adapted to local conditions. Physiological studies of narcosis conducted at the laboratory give promise of leading to improved and simplified commercial methods of shucking oysters that will effect economies in operation and improve the product.

### FISHERIES OF INTERIOR LAKES

Major field investigations in the Great Lakes area during the past year were conducted on Lakes Michigan and Huron, while minor operations were carried on in Lake Erie and also in Lake Champlain. The primary objective of the Lake Michigan work was a study of the chub nets in order to determine their selectivity with regard to chubs and their destructiveness to immature lake trout. A similar investigation was conducted in the northern part of Lake Michigan, in Green Bay, and Lake Huron regarding the destructive action of deep crib nets, a form of gear recently introduced into these waters and which apparently is very destructive to immature fish. A study of the destructiveness of gill nets and trap nets in Lake Erie was completed during the past fiscal year, and reports are now in preparation. Limnological studies conducted during the previous year with the cooperation of the State of Ohio are also progressing. Pollution was demonstrated at the mouths of important rivers, but the extent of conditions detrimental to fish resulting from such pollution was less than had been anticipated.

In the Wisconsin lakes detailed studies of the rate of growth of various food and game fishes have been continued, and work is now progressing in the analysis and correlation of a large number of data collected by the bureau and by the Wisconsin Biological and Natural History Survey.

### FISHERIES OF THE PACIFIC COAST AND ALASKA

In order to properly safeguard the salmon fishery resources of Alaska and to comply with the White Act of 1924, it is essential that a knowledge of the routes of migration of the important salmon runs and an enumeration of the spawning fish passing weirs on their way to headwater streams for propagation and the age composition

of the various runs be available. The bureau's investigators continued biological observations on these subjects and on the red salmon in Bristol Bay and the Karluk, Chignik, and Copper Rivers in Alaska. A similar investigation was carried on with respect to the pink salmon in southeastern Alaska. An additional section of the analysis of the statistics of the Alaska salmon fisheries covering the Prince William Sound area and the Copper and Bering Rivers has been submitted for publication.

Further knowledge of the life history of the Alaska herring demonstrates the racial segregation of the stock and points out the causes of fluctuations in abundance from year to year. Again the principal of dominant year classes apply as in other fisheries and indicate the importance of protecting the supply during periods when natural reproduction falls below normal.

During 1931 an investigation of the sockeye salmon fishery in Puget Sound was undertaken to study the annual changes in abundance of the runs as shown by statistics of the past seasons and to identify distinct races taking part in these runs, if such exist, so that protection may be given to the elements of population that apparently are suffering depletion. Such information will be of great value in protecting the fishery in the event that the international treaty under consideration is finally ratified.

### FISH-SCREEN AND FISH-LADDER INVESTIGATIONS

After extensive trials with various types of fish screens, including the electric, the bureau's investigators have concluded that in order to protect downstream migrating salmon and other fishes from destruction in irrigation projects the revolving mechanical screen is preferable. Under some circumstances success has been had with the electric screen; but public opinion frequently is opposed to its use, and no large-scale program of future installation of this type is contemplated. The bureau has cooperated with the States of Washington, Idaho, and Maine in preparing designs and advice for the installation of improved types of fish ladders on various large-scale hydroelectric or irrigation projects.

### AQUICULTURAL INVESTIGATIONS

A considerable amount of attention is given to problems of interest to the angler, inasmuch as they concern the food and game fishes of interior fresh waters and their culture, distribution, and planting in depleted or formerly barren areas. Facilities for investigations in the interest of fish culture were materially increased during the year by the construction of a new experimental hatchery at Leetown, W. Va. At this station facilities have been provided for detailed laboratory studies on the nutrition of fish and on fish diseases. The hatchery troughs were stocked fully with rainbow, brook, and brown trout eggs and at the close of the year were filled with vigorous and rapidly growing fingerlings. Although funds did not permit the full development of the station, a bass pond was constructed and outdoor pools of circular type are being tested on a considerable scale and are found to be particularly successful for the rearing of trout.

Additional large-scale feeding experiments and work on the selective breeding of superior stocks of trout have continued at the Pittsford (Vt.) experimental hatchery, and excellent results have been obtained in studies of sanitation and disease control and treatment. Cooperative trout and bass cultural studies were also undertaken at the Hackettstown (N. J.) station.

Large-scale pond cultural experiments have been continued at the Fairport (Iowa) laboratory, where pond fertilization and forage fish culture have been adopted as routine practice in growing black bass. Similar studies have been undertaken at the Tishomingo (Okla.) station to adapt successful methods to the special conditions of pond culture in Southern States. An investigation of fish culture in the sloughs of the Upper Mississippi Wild Life and Fish Refuge was completed, demonstrating only limited possibilities in this area because of extreme variations in river level.

### FISHERY STUDIES IN NATIONAL PARKS AND FORESTS

Recognizing the responsibility of the Federal Government of maintaining the supply of fish as well as other wild life in the public domain, arrangements were made with the Forest and Park Services to develop a large-scale program of stocking lakes and streams, particularly in the intermountain area.

### SHELLFISHERY INVESTIGATIONS

Two distinct lines of investigations regarding shellfish and shellfish culture have been continued by the bureau during the past year. These are a study of the oyster and oyster farming, and the propagation of the fresh-water pearl mussel and the attendant problems of river pollution.

An experimental study of the physiology of spawning of Atlantic coast oysters was continued at the Woods Hole laboratory and was extended to the imported Japanese species. Later in the year studies of the nutrition of oysters were undertaken in order to devise means of improving the quality of the product and large-scale experiments have been started on plats of planted oysters at Milford, Conn.

Laboratory studies on the control of the starfish, which is such a destructive pest on oyster and scallop beds, were conducted at Woods Hole; and field experiments using copper salts to kill the animals or drive them from the beds have been conducted in Narragansett and Buzzards Bays.

Oyster cultural studies in the South Atlantic area have been referred to previously.

On the Pacific coast investigations of the native Olympia oyster are continuing at the laboratory at Olympia, Wash.

The problems of the American pearl-button industry, which depends upon the fresh-water mussel for its raw material, have received continued attention from the bureau's investigators. A rapidly diminishing supply of the valuable species led to the perfection of a practical method of propagation a few years ago only to find that increasing pollution rendered vast stretches of our rivers unfit for replanting with young. Even existing supplies of adult mussels were doomed to destruction by accumulating wastes from

industries and domestic sewage combined with silt eroded from the farms and deforested lands. Studies have been directed to testing the feasibility of growing mussels commercially in artificial channels with controlled water supply at the Fort Worth (Tex.) station, where a large supply of brood mussels has been collected and grown for many months.

The adverse effects of river pollution have been so greatly aggravated by the construction of dams as a part of the War Department's program of canalization of important rivers in the Middle West that the bureau's investigators have given that phase of the pollution problem special attention and have cooperated with the United States Engineer Corps in making special studies of conditions at Keokuk and Wilson Dams and at Hastings (Minn.) pool with a view to mitigating the disadvantages to wild life in future construction projects. It is evident that while in itself the construction of dams in the Mississippi River or its tributaries will not adversely affect aquatic organisms but may indeed increase fish production, it will result in increasingly bad conditions until soil erosion is reduced and excessive sewage pollution is eliminated.

## LAW-ENFORCEMENT DIVISION

The limited appropriation for the enforcement of the law regulating interstate transportation of black bass permitted the Bureau of Fisheries to organize in nearly all the States east of the one hundred and fifth meridian, and to obtain a reasonable enforcement of the law with 1 law enforcement officer, 2 black bass law inspectors, and 1 office assistant. At least two more inspectors are needed before satisfactory enforcement can be had. This is exclusive of the Rocky Mountain and Pacific Coast States, which can not be cared for under existing appropriations.

During the year the Secretary appointed 68 State wardens located in 25 States as deputy black bass law inspectors to assist the Federal officers in enforcing the law. These receive no salary from the Federal Government but have been of material assistance and have increased the cooperation already existing between the State fish and game authorities and the Federal officers.

Every effort has been made during the year to broadcast the provisions of the law and to obtain the cooperation of the fishing public, both commercial and sport. Conservation magazines, the daily press, and other publications have heartily cooperated and have published numerous articles relative to furthering the protection for and thus increasing the black bass.

As the Federal law is predicated on an infraction of an existing State law and an interstate transportation, it is essential that persons interested should know the various laws protecting the black bass, for which purpose Fishery Circular No. 9, containing a summary of the black bass laws for 1932, the Federal black bass law in full, and other valuable information pertaining to the protection and increase of game fish was published.

A large number of reports of infractions have been received and all investigated. Some failed to reveal any violation or it was found impossible to prove a violation of a State law. In several instances evidence of violation of State law was obtained which, at the request

of the State authorities, was turned over to them for use in State court. In one instance four cases turned over to State authorities resulted in prosecution and conviction in State court, the imposition of a fine of $25 and costs in each case, and confiscation of the nets illegally used. Other similar cases are pending.

The Federal black bass law officers, by request, have rendered material assistance to State officers in breaking up violations of State laws, where interstate shipments were involved. The States thus aided include Arkansas, Kentucky, Pennsylvania, New Jersey, Florida, Illinois, Ohio, Indiana, Virginia, and Mississippi.

The division has been charged with the administration of the District of Columbia law providing for the issuance of permits to take fish for bait, and 21 of these permits are now outstanding. The division has prepared or assisted in preparing proposed laws, both State and Federal, for further protecting game fish, and on numerous occasions has been called on by State fish authorities and others for expert advice in matters relating to fish protection.

## VESSEL NOTES

The *Albatross II* was engaged throughout the year in scientific research work between Cape Sable, Nova Scotia, and Cape Hatteras, N. C., between the shore line and continental shelf. At convenient times between cruises the vessel underwent necessary repairs at the Boston Navy Yard. The work was under the direction of O. E. Sette. Owing to a severe reduction in the vessel appropriation for the fiscal year 1933, it was necessary to put this vessel out of commission at the close of business June 30, and discharge all officers and crew with the exception of the master and four men whose services are required to care for the vessel while she is out of commission at the dock at the Woods Hole (Mass.) station.

The steamer *Phalarope* was employed as usual as a tender at the Woods Hole Biological Station except for a period during the latter part of April and the first half of May when she was at the Fort Humphreys station on the Potomac in connection with shad investigations. Owing to the reduced appropriation for the fiscal year 1933 the *Phalarope* was placed out of commission on June 30 and is now tied up at the Woods Hole station.

The steamer *Shearwater* was engaged in the usual fish-cultural work at the Put in Bay (Ohio) station during the fall and spring months.

The *Pelican* was engaged in the usual fish-cultural work at the Boothbay Harbor (Me.) station. During the period this vessel was not required for station activities it was detailed to the International Passamaquoddy Fisheries Commission to assist in special investigations for the commission.

The bureau's motor vessel *Fulmar*, stationed at Charlevoix, Mich., and assigned to investigative duty with the Great Lakes scientific staff, has been engaged, except for the period of winter lay-off when the Lakes are frozen, in experimental work on Lake Michigan for the purpose of studying means of preventing the destruction of undersized and immature fish by commercial nets. Experimental fishing stations were occupied weekly throughout the season at numerous points around the entire lake.

Sixteen vessels of the Alaska service cruised about 143,000 nautical miles in the fiscal year 1932, as compared with 145,408 nautical miles in 1931. The *Penguin* covered 28,000 miles and the *Crane* and *Brant* each about 14,000 miles.

The *Penguin* served the Pribilof Islands except in July and August, 1931, when conveying the Commissioner of Fisheries and official party on an inspection tour of Alaska. During this period the *Crane* was at the Pribilofs.

In southeast Alaska the *Auklet*, *Murre*, *Petrel*, and *Widgeon* engaged in fishery protective work. Other vessels were in that district part of the fall, after fishing to the westward ended, as follows: *Crane*, which had been in the Alaska Peninsula region, and transferring seasonal employees to and from Bristol Bay; *Teal*, on Cook Inlet; *Scoter*, on Bristol Bay; and *Kittiwake*, in the Seward-Katalla district. The *Blue Wing* and *Red Wing* patrolled the Kodiak-Afognak area and served the Afognak hatchery; the *Eider* also was in that district, except for two months when relieving the *Crane* in the Alaska Peninsula area. The *Ibis* was at Chignik, the *Merganser* in the Ikatan-Shumagin district, and the *Coot* on the Yukon River. The *Brant* engaged in general supervisory work in southeast Alaska and made several trips to Seattle. The *Brant* also was on patrol duty several weeks off Neah Bay, Wash., to protect the fur-seal herd during its migration northward. The *Widgeon* performed similar duty in southeast Alaska.

During the winter the *Auklet* and *Widgeon* were extensively rebuilt at Seattle, and other vessels were given a general overhauling. The *Merganser* has been assigned to the Yes Bay hatchery.

## APPROPRIATIONS

Appropriations for the bureau for the fiscal year aggregated $2,905,540, as follows:

| | |
|---|---|
| Salaries | $201,660 |
| Miscellaneous expenses: | |
| Administration | 4,400 |
| Propagation of food fishes | 1,022,760 |
| Maintenance of vessels | 316,920 |
| Inquiry respecting food fishes | 300,340 |
| Fishery industries | 116,620 |
| Protecting sponge fisheries | 3,100 |
| Protecting seal and salmon fisheries of Alaska | 446,240 |
| Upper Mississippi Wild Life and Fish Refuge | 25,000 |
| Construction of stations | 448,500 |
| Enforcement of black bass law | 20,000 |
| | 2,905,540 |

Very truly yours,

HENRY O'MALLEY,
*Commissioner of Fisheries.*

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# ALASKA FISHERY AND FUR-SEAL INDUSTRIES IN 1931 [1]

By WARD T. BOWER, *Chief, Division of Alaska Fisheries*

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[1] Appendix I to the Report of the U. S. Commissioner of Fisheries for 1932. Approved for publication May 11, 1932.

## INTRODUCTION

The bureau's work in Alaska, which has to do primarily with the maintenance of the fishery resources and the management of the Pribilof Islands fur-seal industry, followed the same plan as in former years. Particular attention was given to problems concerning the conservation of the salmon, by far the most important economic product of the Territory. Careful observations of the runs were made throughout the season and restrictions in commercial fishing were modified from time to time to meet changing conditions. A general inspection of the fishery and fur-seal activities was made by the Commissioner of Fisheries, accompanied by an official party, during July and August.

In the patrol of the fishing grounds to enforce compliance with the fishery laws and regulations 15 bureau vessels and a number of chartered boats were employed, and more than 200 persons were identified with the work for varying periods. Incidental to patrol duties in certain localities were the destruction of predatory enemies of salmon and the removal of obstructions that blocked the passage of salmon to the spawning grounds.

Studies of the life history of the salmon, herring, and other aquatic resources were continued. Weirs for counting the escapement of brood fish were operated in 27 typical salmon streams as a means of determining the ratio of escape to catch and the size of a spawning colony required to insure ample seeding of the beds and thus an unimpaired future run. Fish-cultural work was carried on at two Government hatcheries and one private hatchery.

Sealing operations at the Pribilof Islands resulted in the take of 49,524 fur-seal skins, or about 17 per cent more than the number obtained in 1930. Killings in general were from surplus 3-year-old male seals. A suitable number of animals of this age class were reserved for future breeding stock. The computation of the herd as of August 10, 1931, by bureau employees at the islands showed 1,127,082 animals of all classes, an increase of 81,981 over the corresponding figures for the previous year. The fox herds on St. Paul and St. George Islands were in satisfactory condition and yielded 1,401 blue and 25 white pelts in the 1931–32 season.

Progress was made in the construction of new buildings and the installation of additional equipment to facilitate handling the increased fur-seal work, and some extension of improved roads was accomplished on both islands.

Through the cooperation of the Navy Department the general shipment of supplies for the Pribilof Islands was forwarded on the U. S. S. *Vega*, and the sealskins taken during the season were transported on the return trip to Seattle. Valuable assistance was rendered also by the U. S. Coast Guard in maintaining a patrol for the protection of the fur-seal herd.

Three public auction sales of fur-seal skins were held in 1931, at two of which fox skins from the Pribilof Islands were sold also.

Acknowledgment is made of the assistance rendered by members of the bureau's staff in the preparation of this document.

## VISIT OF THE COMMISSIONER OF FISHERIES TO ALASKA

The Commissioner of Fisheries sailed from Seattle aboard the *Penguin* on June 28 for the annual inspection of the fisheries of Alaska. Brief stops were made in southeastern Alaska, and on July 4 the *Penguin* departed from Juneau for Bristol Bay, via False Pass. A trip was made also to the Pribilof Islands, where sealing operations were observed. On the return trip the *Penguin* called at Kodiak, where Commissioner O'Malley boarded a commercial steamer on July 24 for the return trip to Juneau. The greater part of August was devoted to a study of fishery conditions in southeastern Alaska.

Commissioner O'Malley was accompanied on his inspection trip by Senator Frederic C. Walcott, chairman of the Senate Committee on Wild Life Resources, the secretary of this committee, and others interested in the conservation of the fishery resources of the Territory.

Following his visit to Alaska the commissioner spent several days in the Pacific Coast States in connection with important fishery matters and returned to Washington on September 11.

## EXECUTIVE ORDER RESTORING CERTAIN LANDS FROM ALASKA SALMON HATCHERY RESERVATION

Under date of June 8, 1931, an Executive order was issued restoring to public entry a small tract of land not needed in connection with the Yes Bay fish-cultural reservation. The text of the order is as follows:

> It is hereby ordered that Executive order of February 1, 1906, reserving certain lands on Yes Lake in the Cleveland Peninsula in southeastern Alaska as a site for a salmon hatchery be, and the same is hereby, revoked as to the tract of land now identified as United States Survey No. 1981, comprising 6.33 acres.

# FISHERY INDUSTRIES

As in corresponding reports for previous years, the Territory of Alaska is here considered in the three coastal geographic sections generally recognized, as follows: (1) Southeast Alaska—embracing all that narrow strip of mainland and the numerous adjacent islands from Portland Canal northwestward to and including Yakutat Bay; (2) central Alaska—the region on the Pacific from Yakutat Bay westward, including Prince William Sound, Cook Inlet, and the southern coast of Alaska Peninsula, to Unimak Pass; and (3) western Alaska—the north shore of the Alaska Peninsula, including the Aleutian Islands westward from Unimak Pass, Bristol Bay, and the Kuskokwim and Yukon Rivers. These divisions are solely for statistical purposes and do not coincide with areas established in departmental regulations.

Detailed reports and statistical tables dealing with the various fishery industries are presented herewith, and there are also given the important features of certain subjects that were the objects of special investigation or inquiry.

## NEW FISHERY REGULATIONS

The regulations for the protection of the fisheries of Alaska, issued December 18, 1930, were amended by the following regulations issued by the Acting Secretary of Commerce under the dates indicated:

[*March 6, 1931*]

### Bristol Bay Area

*Salmon fishery.*—Regulation No. 3 is amended to read as follows: Each gill net in operation shall be marked by a cluster of floats or corks at the ends, and double floats or corks shall be attached to the cork line at 25-fathom intervals. The clusters of floats or corks at the ends and the double floats or corks at the 25-fathom intervals shall be painted bright red. The clusters at the ends shall also be legibly and plainly marked with the initials of the operator.

### Alaska Peninsula Area

*Salmon fishery.*—1. Regulation No. 15 is amended to read as follows: Commercial fishing for salmon along the mainland shore on the south side of Alaska Peninsula from Kabuch Point easterly to Morgan Point is prohibited prior to July 15 in each year: *Provided*, That this prohibition shall not apply to the waters of Morzhovoi Bay west of 163 degrees 1 minute 45 seconds west longitude after 6 o'clock antemeridian June 1 in each year.

2. Regulation No. 16 is amended to read as follows: Commercial fishing for salmon along the mainland shore on the south side of Alaska Peninsula from a point on the coast one statute mile northwesterly of the outer extremity of Moss Cape to the outer extremity of Kupreanof Point is prohibited prior to July 1 in each year.

3. Regulation No. 17 is amended to read as follows: All commercial fishing for salmon, except by beach seines not exceeding 65 fathoms in length, is prohibited (*a*) in all waters between Cape Tachilni and the southern extremity of Bold Cape, and (*b*) in all waters from Cape Tolstoi to the outer extremity of Kupreanof Point.

4. Regulation No. 22 (*d*) is amended to read as follows: Along the coast on the west side of Morzhovoi Bay within 2,500 feet measured along the coast from a point at 55 degrees 1 minute north latitude, 163 degrees 11 minutes 9 seconds west longitude.

5. Regulation No. 22 (*l*) is amended to read as follows: Mainland coast along the west side of Pavlof Bay from 55 degrees 15 minutes 30 seconds north latitude to 55 degrees 20 minutes north latitude.

6. Regulation No. 22 (*n*) is amended to read as follows: Unga and Popof Islands: East coast of Unga Island (1) from a point at 55 degrees 13 minutes 39 seconds north latitude, 160 degrees 30 minutes west longitude, easterly and southerly to a point at 55 degrees 13 minutes 15 seconds north latitude, 160 degrees 29 minutes 42 seconds west longitude, and (2) from a point at 55 degrees 12 minutes 10 seconds north latitude, 160 degrees 29 minutes 42 seconds west longitude, southerly and easterly to a point at 55 degrees 11 minutes 30 seconds north latitude, 160 degrees 27 minutes 30 seconds west longitude, and east coast of Popof Island within 2,500 feet of a point at 55 degrees 16 minutes north latitude, 160 degrees 19 minutes 40 seconds west longitude.

7. All commercial fishing for salmon is prohibited in all waters of Orzinski (Orzenoi) Bay.

### Chignik Area

*Herring fishery.*—1. Regulation No. 6 is amended to read as follows: Commercial fishing for herring, except for bait purposes, by means of any purse seine is prohibited.

2. Commercial fishing for herring, including bait fishing, by means of any beach seine more than 50 fathoms in length is prohibited.

### Kodiak Area

*Salmon fishery.*—1. Regulation No. 3 is amended to read as follows: Beach seines shall be set from the beach only, and one end of the seine must remain on the beach until the set is completed. No beach seine shall be used as a purse

seine. No beach seine shall be set as a trap or as a lead and left without reasonably prompt completion of the seining operation.

2. Regulation No. 10 is amended to read as follows: Commercial fishing for salmon in Karluk waters extending from Cape Karluk to West Point and from Raspberry Cape to a point at the entrance of Raspberry Strait at 58 degrees 7 minutes 45 seconds north latitude, 153 degrees 14 minutes west longitude, is prohibited prior to 6 o'clock antemeridian June 1 in each year. The take of red salmon in these waters shall not exceed 50 per cent of the total run as determined at the weir in Karluk River operated by the Bureau of Fisheries.

3. Regulation No. 15 is amended to read as follows: Commercial fishing for salmon is prohibited from August 15 to August 31, both dates inclusive: *Provided*, That this prohibition shall not apply (1) to beach seines on the north coast of Kodiak Island from Cape Karluk to Cape Uyak, (2) to set gill nets on the north coast of Kodiak Island from Cape Uyak to West Point, (3) to traps (*a*) on the west shore of Kodiak Island from Chief Point to West Point and on the west coast of Raspberry Island from Raspberry Cape to a point at the entrance to Raspberry Strait at 58 degrees 7 minutes 45 seconds north latitude, 153 degrees 14 minutes west longitude, (*b*) to traps on Afognak Island, (*c*) to traps on the north shore of the entrance to Moser Bay within 1 statute mile outside of Bun Point, and (*d*) on the east side of Turn Island.

4. Regulation No. 18 (*j*) is amended to read as follows: Kodiak Island near entrance to Uyak Bay: Along the coast (1) within 2,500 feet of a point at 57 degrees 46 minutes north latitude, 153 degrees 56 minutes 24 seconds west longitude, and (2) within 5,000 feet easterly of a point at 57 degrees 41 minutes 48 seconds north latitude, 153 degrees 54 minutes 45 seconds west longitude.

5. Regulation No. 19 (*l*) is amended to read as follows: Kiliuda Bay: All waters of the bay west of 153 degrees 3 minutes west longitude.

### Cook Inlet Area

*Salmon fishery.*—1. Regulation No. 1 is amended to read as follows: North of 60 degrees 20 minutes north latitude commercial fishing for salmon is prohibited prior to 6 o'clock antemeridian June 5 and after 6 o'clock postmeridian August 1 in each year. Between 60 degrees 20 minutes north latitude and the latitude of Anchor Point Light commercial fishing for salmon is prohibited prior to 6 o'clock antemeridian June 5 in each year: *Provided*, That this prohibition shall not apply to the use of gill nets of mesh not less than 8½ inches stretched measure between knots after 6 o'clock antemeridian June 1. Between 60 degrees 20 minutes north latitude and the latitude of Anchor Point Light commercial fishing for salmon is prohibited after 6 o'clock postmeridian August 1 in each year. South of the latitude of Anchor Point Light commercial fishing for salmon is prohibited prior to 6 o'clock antemeridian June 10 in each year: *Provided*, That this prohibition shall not apply to the use of gill nets of mesh not less than 8½ inches stretched measure between knots after 6 o'clock antemeridian May 20. South of the latitude of Anchor Point Light commercial fishing for salmon is prohibited after 6 o'clock postmeridian August 5 in each year, except that beach seines may be operated south of the latitude of Anchor Point Light in the period from 6 o'clock antemeridian August 20 to 6 o'clock postmeridian September 3.

2. Regulation No. 14 (*l*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet (1) on the west side of Nubble Point Spit within 1,200 feet of a point at 59 degrees 28 minutes 45 seconds north latitude, 151 degrees 35 minutes 6 seconds west longitude, and (2) within 1,000 feet of a point at 59 degrees 28 minutes 30 seconds north latitude, 151 degrees 37 minutes west longitude.

### Bering River Area

*Salmon fishery.*—1. The regulation prohibiting commercial fishing for salmon at all times is amended so as to permit commercial fishing for salmon from 6 o'clock antemeridian August 10 to 6 o'clock postmeridian September 20 in each calendar year.

2. Commercial fishing shall be conducted solely by drift gill nets, or by gill nets attached to anchored boats or other anchored floating equipment and operated in substantially a straight line.

## Southeastern Alaska Area

### WESTERN DISTRICT

*Salmon fishery.* Regulation No. 19 (*m*) is amended to read as follows: Admiralty Island: West coast from a point north of Wilson Cove at 57 degrees 10 minutes 30 seconds north latitude to Point Caution, exclusive of the coast (1) between 57 degrees 10 minutes 40 seconds north latitude and 57 degrees 11 minutes 50 seconds north latitude and (2) between 57 degrees 13 minutes 15 seconds north latitude and 57 degrees 14 minutes 30 seconds north latitude.

### NORTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—Regulation No. 17 (*ss*) is amended to read as follows: Prince of Wales Island: East coast from the northern extremity of Clover Point to a point at 55 degrees 22 minutes 17 seconds north latitude, 132 degrees 11 minutes 40 seconds west longitude, exclusive of the coast (1) between a point at 55 degrees 20 minutes 51 seconds north latitude, 132 degrees 9 minutes 43 seconds west longitude, and a point at 55 degrees 21 minutes 52 seconds north latitude, 132 degrees 10 minutes west longitude, and (2) between 55 degrees 19 minutes 5 seconds north latitude and 55 degrees 20 minutes 10 seconds north latitude.

### SOUTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—Regulation No. 15 (*h*) is amended to read as follows: Long Island, east of Dall Island: East and west coasts within 2,500 feet measured along the coast from 54 degrees 46 minutes 15 seconds north latitude.

### SOUTHERN DISTRICT

*Salmon fishery.*—Regulation No. 17 (*p*) is amended to read as follows: Foggy Bay to Cape Fox: From within 1 statute mile northward and eastward of Foggy Point to the southern extremity of Cape Fox, including Cape Fox Island and the western shore of the unnamed island at 54 degrees 47 minutes 26 seconds north latitude, 130 degrees 55 minutes 10 seconds west longitude.

## General Regulations, Effective in All Waters of Alaska

General Regulation No. 3 is amended to read as follows: The use of any wire spiller in connection with any fish trap will be permitted only when an inner spiller of webbing also is used, conforming in size and shape with the outer wire spiller. The web spiller shall be so constructed as to prevent salmon or other fishes from passing over its walls and becoming caught between it and the wire spiller.

[*March 17, 1931*]

## Kodiak Area

*Salmon fishery.*—1. Regulation No. 18 (*i*) is amended to read as follows: Kodiak Island: Along the coast on the west side of Uganik Bay between West Point and Broken Point: *Provided,* That in 1931 no trap shall be permitted to operate between West Point and a point at 57 degrees 50 minutes 15 seconds north latitude, 153 degrees 37 minutes 5 seconds west longitude.

2. Regulation No. 18 (*n*) is amended to read as follows: Kodiak Island: Within 2,500 feet of a point on the south shore of Kiliuda Bay at 57 degrees 16 minutes 17 seconds north latitude, 153 degrees 1 minute 54 seconds west longitude: *Provided,* That no trap shall be permitted to operate in 1931.

3. Regulation No. 18 (*o*) is amended to read as follows: Kodiak Island: Coast from a point 1 statute mile westward of Sitkalidak or Old Harbor Narrows southwestward for a distance of 5,000 feet: *Provided,* That no trap shall be permitted to operate in 1931.

## Cook Inlet Area

*Salmon fishery.*—1. Regulation No. 14 (*g*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet from the northern extremity of Point Possession southwesterly to a point at 60 degrees 58 minutes 22 seconds north latitude, 150 degrees 36 minutes 30 seconds west longitude, exclusive of 1 statute mile each side of the mouths of all salmon streams and exclusive of the coast within 1,000 feet of a point at 61 degrees 2 minutes north latitude, 150

degrees 24 minutes 45 seconds west longitude: *Provided*, That in 1931 no trap will be permitted to operate northerly of the point on the coast 1,000 feet southerly of the point at 61 degrees 2 minutes north latitude, 150 degrees 24 minutes 45 seconds west longitude.

2. Regulation No. 14 (*j*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet (1) from a point north of Boulder Point at 60 degrees 46 minutes 18 seconds north latitude, 151 degrees 15 minutes 40 seconds west longitude, southerly to a point at 60 degrees 44 minutes 1 second north latitude, 151 degrees 19 minutes 58 seconds west longitude; (2) from a point at 60 degrees 43 minutes 44 seconds north latitude, 151 degrees 22 minutes 12 seconds west longitude, southerly to a point at 60 degrees 19 minutes 39 seconds north latitude, 151 degrees 23 minutes 24 seconds west longitude, exclusive of 2½ statute miles each side of the mouth of Kenai River, 2½ statute miles each side of the mouth of Kasilof River, and 1 statute mile each side of the mouths of all other salmon streams; and (3) from a point at 60 degrees 18 minutes 48 seconds north latitude, 151 degrees 23 minutes 20 seconds west longitude, southerly to a point 2 statute miles northward from the mouth of Anchor Point River, exclusive of 2 statute miles each side of the mouth of Ninilchik River, 2 statute miles each side of the mouth of Deep Creek, 1 statute mile each side of the mouths of all other salmon streams, and exclusive of the coast within 6,000 feet of a point at 59 degrees 57 minutes 50 seconds north latitude, 151 degrees 44 minutes 17 seconds west longitude, and of the coast within ½ statute mile of a point at 59 degrees 50 minutes 10 seconds north latitude, 151 degrees 49 minutes 30 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) within 3,500 feet northward of the point 2 statute miles northward from the mouth of Anchor Point River, (2) within 2,500 feet of a point at 59 degrees 54 minutes north latitude, 151 degrees 46 minutes 30 seconds west longitude, (3) within 2,500 feet of a point at 59 degrees 54 minutes 28 seconds north latitude, 151 degrees 46 minutes 8 seconds west longitude, and (4) within 2,500 feet of a point at 60 degrees 15 minutes 47 seconds north latitude, 151 degrees 23 minutes 36 seconds west longitude.

3. Regulation No. 14 (*l*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet (1) on the west side of Nubble Point Spit within 1,200 feet of a point at 59 degrees 28 minutes 45 seconds north latitude, 151 degrees 35 minutes 6 seconds west longitude, and (2) within 1,000 feet of a point at 59 degrees 28 minutes 30 seconds north latitude, 151 degrees 37 minutes west longitude: *Provided*, That in 1931 no trap shall be permitted to operate within 1,000 feet of the point at 59 degrees 28 minutes 30 seconds north latitude, 151 degrees 37 minutes west longitude.

4. Regulation No. 14 (*n*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet within 1,000 feet of a point at 59 degrees 25 minutes 35 seconds north latitude, 151 degrees 52 minutes west longitude, and from a point at 59 degrees 24 minutes 30 seconds north latitude, 151 degrees 53 minutes 45 seconds west longitude, southerly to a point at 59 degrees 23 minutes 12 seconds north latitude, 151 degrees 54 minutes west longitude: *Provided*, That in 1931 no trap shall be permitted to operate within 1,000 feet of the point at 59 degrees 25 minutes 35 seconds north latitude, 151 degrees 52 minutes west longitude.

## Prince William Sound Area

*Salmon fishery.*—1. Regulation No. 11 (*e*) is amended to read as follows: Within 1 statute mile eastward of the southwestern extremity of Naked Island: *Provided*, That no trap shall be permitted to operate in 1931.

2. Regulation No. 11 (*h*) is amended to read as follows: Western side of Valdez Arm from Point Freemantle to 60 degrees 59 minutes north latitude: *Provided*, That in 1931 no trap shall be permitted to operate between 60 degrees 56 minutes north latitude and 60 degrees 57 minutes 40 seconds north latitude.

3. Regulation No. 11 (*m*) is amended to read as follows: Within ½ statute mile of the northern extremity of the land between Two Moon Bay and Snug Corner Cove: *Provided*, That no trap shall be permitted to operate in 1931.

4. Regulation No. 11 (*w*) is amended to read as follows: Hinchinbrook Island: Within 2,500 feet, measured along the coast, from a point at 60 degrees 28 minutes 54 seconds north latitude, 146 degrees 32 minutes 11 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

5. Regulation No. 11 (*x*) is amended to read as follows: Hinchinbrook Island: From a point on the coast at 60 degrees 27 minutes north latitude, 146 degrees 39 minutes 48 seconds west longitude, northward to the light at Johnstone Point: *Provided*, That in 1931 no trap shall be permitted to operate south of 60 degrees 28 minutes north latitude.

6. Regulation No. 11 (*aa*) is amended to read as follows: Montague Island: Along the coast within 2,500 feet from a point at 59 degrees 47 minutes north latitude, 147 degrees 55 minutes 50 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

7. Regulation No. 11 (*bb*) is amended to read as follows: Montague Island: Along the coast from a point on the south side of Macleod Harbor at 59 degrees 52 minutes 10 seconds north latitude, 147 degrees 51 minutes west longitude, to a point at 59 degrees 50 minutes 49 seconds north latitude, 147 degrees 54 minutes 6 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate except within 2,500 feet southwesterly of the point at 59 degrees 52 minutes 10 seconds north latitude, 147 degrees 51 minutes west longitude.

8. Regulation No. 11 (*cc*) is amended to read as follows: Western coast of Montague Island from Point Woodcock to a point on the south side of Hanning Bay at 147 degrees 42 minutes 40 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate north of 59 degrees 55 minutes 10 seconds north latitude.

9. Regulation No. 11 (*dd*) is amended to read as follows: Western coast of Montague Island from the north side of the entrance to Hanning Bay northeasterly to 60 degrees 9 minutes 45 seconds north latitude (as shown on U. S. Coast and Geodetic Survey chart No. 8551): *Provided*, That in 1931 no trap shall be permitted to operate from a point at 60 degrees 1 minute 50 seconds north latitude, 147 degrees 34 minutes 40 seconds west longitude, to a point at 60 degrees 6 minutes 6 seconds north latitude.

10. Regulation No. 11 (*ee*) is amended to read as follows: Western coast of Montague Island from a point at 60 degrees 10 minutes 20 seconds north latitude northeasterly to a point at 60 degrees 12 minutes 17 seconds north latitude, 147 degrees 17 minutes 15 seconds west longitude (as shown on U. S. Coast and Geodetic Survey chart No. 8551): *Provided*, That no trap shall be permitted to operate in 1931.

11. Regulation No. 11 (*ff*) is amended to read as follows: Northern coast of Montague Island from Graveyard Point to a point on the coast ½ statute mile westerly of Montague Point: *Provided*, That in 1931 no trap shall be operated north of 60 degrees 21 minutes 30 seconds north latitude.

## Southeastern Alaska Area

### ICY STRAIT DISTRICT

*Salmon fishery.*—1. Regulation No. 16 (*b*) is amended to read as follows: Inian Islands: (1) North of 58 degrees 15 minutes 42 seconds north latitude, exclusive of the east end of the northeastern island; and (2) southwest coast of the northwestern island between 58 degrees 15 minutes 42 seconds north latitude and 58 degrees 15 minutes 18 seconds north latitude: *Provided*, That in 1931 no trap shall be operated east of 136 degrees 20 minutes west longitude.

2. Regulation No. 16 (*l*) is amended to read as follows: Mainland: From a point on the east side of Excursion Inlet at 58 degrees 23 minutes north latitude southward to 135 degrees 8 minutes 40 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate between 58 degrees 18 minutes 45 seconds north latitude and 58 degrees 16 minutes 55 seconds north latitude.

### WESTERN DISTRICT

*Salmon fishery.*—1. Regulation No. 19 (*c*) is amended to read as follows: Chichagof Island: Eastern coast from a point at 58 degrees 2 minutes 8 seconds north latitude, 134 degrees 56 minutes 26 seconds west longitude, southerly to North Passage Point, exclusive of False Bay, and during 1931 exclusive also of the coast between 57 degrees 59 minutes 20 seconds north latitude and 58 degrees 1 minute 15 seconds north latitude.

2. Regulation No. 19 (*d*) is amended to read as follows: Chichagof Island: Eastern coast from South Passage Point to Point Hayes, exclusive of (1) Basket Bay and within ½ statute mile of each side of its entrance, and (2) exclusive of the coast from 57 degrees 33 minutes north latitude southerly to 57 degrees 30 minutes 30 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) south of 57 degrees 34 minutes 40 seconds north latitude, (2) between 57 degrees 36 minutes 20 seconds north latitude and 57 degrees 38 minutes 28 seconds north latitude, (3) between 57 degrees 42 minutes north latitude and 57 degrees 44 minutes 6 seconds north latitude and (4) north of 57 degrees 44 minutes 31 seconds north latitude.

3. Regulation No. 19 (*e*) is amended to read as follows: Baranof Island: From a point ½ statute mile south of Point Thatcher to Point Lull, exclusive of the coast between 57 degrees 20 minutes 35 seconds north latitude and 57 degrees 23 minutes 30 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate south of 57 degrees 20 minutes 35 seconds north latitude.

4. Regulation No. 19 (*g*) is amended to read as follows: Baranof Island: East coast from a point at the south side of the entrance to Kasnyku Bay at 57 degrees 12 minutes north latitude to a point 1 statute mile northwesterly of Point Turbot: *Provided*, That in 1931 no trap shall be permitted to operate north of 57 degrees 11 minutes 10 seconds north latitude.

5. Regulation No. 19 (*k*) is amended to read as follows: Admiralty Island: West coast from a point ¾ statute mile north of Parker Point to 58 degrees 2 minutes north latitude, exclusive of the coast (1) between 57 degrees 47 minutes north latitude and 57 degrees 48 minutes 30 seconds north latitude, and (2) between 57 degrees 51 minutes north latitude and 57 degrees 53 minutes 30 seconds north latitude, and during 1931 exclusive also of the coast (1) between 57 degrees 43 minutes 24 seconds north latitude and 57 degrees 46 minutes north latitude, (2) between 57 degrees 53 minutes 30 seconds north latitude and 57 degrees 54 minutes 40 seconds north latitude, and (3) between 57 degrees 55 minutes 15 seconds north latitude and 57 degrees 45 minutes north latitude.

6. Regulation No. 19 (*l*) is amended to read as follows: Admiralty Island: West coast from Village Point to Distant Point: *Provided*, That in 1931 no trap shall be permitted to operate south of 57 degrees 22 minutes 15 seconds north latitude.

7. Regulation No. 19 (*m*) is amended to read as follows: Admiralty Island: West coast from a point north of Wilson Cove at 57 degrees 10 minutes 30 seconds north latitude to Point Caution, exclusive of the coast (1) between 57 degrees 10 minutes 40 seconds north latitude and 57 degrees 11 minutes 50 seconds north latitude and (2) between 57 degrees 12 minutes 25 seconds north latitude and 57 degrees 14 minutes 30 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate between 57 degrees 10 minutes 30 seconds north latitude and 57 degrees 10 minutes 40 seconds north latitude.

### EASTERN DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*b*) is amended to read as follows: Mainland: From the south side of Limestone Inlet at 58 degrees 1 minute 30 seconds north latitude southward to a point at 57 degrees 59 minutes 10 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate between 58 degrees north latitude and 58 degrees 1 minute 12 seconds north latitude.

2. Regulation No. 17 (*f*) is amended to read as follows: Mainland, between Hobart Bay and Windham Bay: From a point at 57 degrees 26 minutes 20 seconds north latitude to a point at 57 degrees 30 minutes north latitude: *Provided*, That during 1931 no trap shall be operated south of 57 degrees 27 minutes 20 seconds north latitude.

3. Regulation No. 17 (*h*) is amended to read as follows: Mainland, Frederick Sound: From a point on the south side of Fanshaw Bay at 133 degrees 32 minutes 30 seconds west longitude to Cape Fanshaw, thence southeasterly to 133 degrees 21 minutes west longitude, excluding coast between 133 degrees 22 minutes west longitude and 133 degrees 26 minutes west longitude and during 1931 exclusive also of the coast between 133 degrees 26 minutes west longitude and 133 degrees 30 minutes west longitude.

4. Regulation No. 17 (*l*) is amended to read as follows: Kupreanof Island: Northwest coast (1) from a point ½ statute mile southeast of the outer extremity of Point Macartney northward to a point at 57 degrees 1 minute 40 seconds north latitude, 134 degrees 1 minute west longitude, and (2) from a point at 57 degrees 3 minutes 15 seconds north latitude, 134 degrees 1 minute 15 seconds west longitude, to a point on the north shore at 57 degrees 5 minutes 50 seconds north latitude, 133 degrees 54 minutes 20 seconds west longitude, excluding coast between 133 degrees 56 minutes 45 seconds west longitude and 134 degrees 1 minute west longitude: *Provided*, That during 1931 no trap shall be permitted to operate (1) on the north side of Point Macartney from the outer extremity of Point Macartney to a point at 57 degrees 1 minute 40 seconds north latitude, 134 degrees 1 minute west longitude and (2) north of 57 degrees 5 minutes north latitude (as shown on U. S. Coast and Geodetic Survey chart No. 8200).

5. Regulation No. 17 (*n*) is amended to read as follows: Kuiu Island: North west coast from a point 1 statute mile north of the north side of the entrance to

Washington Bay northward to the point at the east side of the entrance to Band Cove: *Provided*, That in 1931 no trap shall be permitted to operate between 56 degrees 45 minutes 50 seconds north latitude and 56 degrees 47 minutes 50 seconds north latitude.

NORTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*a*) is amended to read as follows: San Juan Bautista Island: From a point on the west coast at 55 degrees 25 minutes 45 seconds north latitude southerly and easterly to a point on the south coast at 55 degrees 24 minutes north latitude, 133 degrees 18 minutes 30 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate south of 55 degrees 24 minutes 45 seconds north latitude. A part of these waters is in the South Prince of Wales Island district.

2. Regulation No. 17 (*e*) is amended to read as follows: Culebra Island: Coast west of 133 degrees 26 minutes 30 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

3. Regulation No. 17 (*i*) is amended to read as follows: Heceta Island: Western and southern coasts from a point on the coast at 55 degrees 45 minutes 16 seconds north latitude, 133 degrees 40 minutes west longitude, to a point on the coast at 55 degrees 41 minutes 30 seconds north latitude, 133 degrees 31 minutes 40 seconds west longitude, excluding the coast between a point at 55 degrees 44 minutes 50 seconds north latitude, 133 degrees 39 minutes 9 seconds west longitude, and a point at 55 degrees 43 minutes 7 seconds north latitude, 133 degrees 37 minutes 23 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate between a point at 55 degrees 45 minutes 16 seconds north latitude, 133 degrees 40 minutes west longitude, and a point at 55 degrees 44 minutes 50 seconds north latitude, 133 degrees 39 minutes 9 seconds west longitude.

4. Regulation No. 17 (*n*) is amended to read as follows: Kosciusko Island: Western coast (1) within 5,000 feet southerly of Ruins Point at 56 degrees 4 minutes north latitude, (2) within 5,000 feet northerly of 55 degrees 59 minutes 40 seconds north latitude, and (3) the small islet at the north point of the entrance to Pole Anchorage, but no trap shall be operated off this islet in 1931.

5. Regulation No. 17 (*q*) is amended to read as follows: Warren Island, near Kosciusko Island: East coast of Warren Island within 2,000 feet of a point at 55 degrees 53 minutes 10 seconds north latitude: *Provided*, That no trap shall be permitted to operate in 1931.

6. Regulation No. 17 (*r*) is amended to read as follows: Kuiu Island: East coast within 2,500 feet southerly from a point on the coast near the entrance to Port McArthur at 56 degrees 3 minutes north latitude: *Provided*, That no trap shall be permitted to operate in 1931.

7. Regulation No. 17 (*s*) is amended to read as follows: Kuiu Island: East coast within 2,500 feet from a point at 56 degrees 13 minutes 19 seconds north latitude, 133 degrees 52 minutes 35 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

8. Regulation No. 17 (*w*) is amended to read as follows: Prince of Wales Island: North coast from Pine Point to Point Colpoys: *Provided*, That in 1931 no trap shall be permitted to operate west of 133 degrees 12 minutes 30 seconds west longitude.

9. Regulation No. 17 (*x*) is amended to read as follows: Kupreanof Island: Southern coast within 2,500 feet from a point at 56 degrees 26 minutes 8 seconds north latitude, 133 degrees 29 minutes 35 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

10. Regulation No. 17 (*y*) is amended to read as follows: Etolin Island: West coast from 56 degrees 18 minutes north latitude southward to Steamer Point, exclusive of the coast between 132 degrees 38 minutes west longitude and 56 degrees 15 minutes north latitude: *Provided*, That in 1931 no trap shall be permitted to operate north of 56 degrees 16 minutes 40 seconds north latitude.

11. Regulation No. 17 (*ee*) is amended to read as follows: Blashke Island: Coast west of 132 degrees 55 minutes west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

12. Regulation No. 17 (*jj*) is amended to read as follows: Onslow Island: West coast from Gull Point to Ernest Point: *Provided*, That in 1931 no trap shall be permitted to operate north of 55 degrees 51 minutes 45 seconds north latitude.

13. Regulation No. 17 (*oo*) is amended to read as follows: Cleveland Peninsula: From a point on the east side of Clarence Strait at 55 degrees 44 minutes 7 seconds north latitude, 132 degrees 15 minutes 36 seconds west longitude, southerly

to Caamano Point, thence northeasterly to a point at 55 degrees 34 minutes 5 seconds north latitude near the south side of the entrance to Smugglers Cove, exclusive of the east side of Clarence Strait (1) between 132 degrees 2 minutes west longitude and 132 degrees 4 minutes west longitude, (2) between 55 degrees 33 minutes 30 seconds north latitude and 55 degrees 34 minutes 45 seconds north latitude, (3) between 55 degrees 36 minutes 10 seconds north latitude and 55 degrees 38 minutes north latitude, (4) between 55 degrees 40 minutes north latitude and 55 degrees 41 minutes 10 seconds north latitude, and (5) between 55 degrees 41 minutes 45 seconds north latitude and 55 degrees 43 minutes north latitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 55 degrees 41 minutes 10 seconds north latitude and 55 degrees 41 minutes 45 seconds north latitude, (2) between 55 degrees 38 minutes north latitude and 55 degrees 39 minutes 30 seconds north latitude, and (3) along the shore of Bond Bay. A part of these waters is in the southern district.

14. Regulation No. 17 (*aaa*) is amended to read as follows: Prince of Wales Island: From a point on Cape Chacon at 54 degrees 41 minutes 23 seconds north latitude, 132 degrees 1 minute west longitude, northerly to a point at approximately 54 degrees 45 minutes north latitude, 132 degrees west longitude: *Provided*, That in 1931 no trap shall operate except within 2,500 feet of a point at 54 degrees 43 minutes 5 seconds north latitude, 132 degrees 54 minutes west longitude.

15. During 1931 commercial fishing for salmon by means of any trap is prohibited along the east coast of Prince of Wales Island from a point ½ statute mile northwest of Luck Point at 55 degrees 52 minutes 25 seconds north latitude southward to a point at approximately 54 degrees 45 minutes north latitude, 132 degrees west longitude, including Grindall, Wedge, and Polk Islands, except as follows:

(*a*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 57 minutes north latitude, 132 degrees 41 minutes 59 seconds west longitude.

(*b*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 55 minutes 34 seconds north latitude, 132 degrees 38 minutes 59 seconds west longitude.

(*c*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 54 minutes 28 seconds north latitude, 132 degrees 36 minutes 59 seconds west longitude.

(*d*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 50 minutes 57 seconds north latitude, 132 degrees 32 minutes 43 seconds west longitude.

(*e*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 47 minutes 50 seconds north latitude, 132 degrees 29 minutes west longitude.

(*f*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 38 minutes 38 seconds north latitude, 132 degrees 21 minutes 23 seconds west longitude.

(*g*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 36 minutes 25 seconds north latitude, 132 degrees 20 minutes 47 seconds west longitude.

(*h*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 34 minutes 2 seconds north latitude, 132 degrees 18 minutes 42 seconds west longitude.

(*i*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 32 minutes 25 seconds north latitude, 132 degrees 16 minutes west longitude.

(*j*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 30 minutes 56 seconds north latitude, 132 degrees 12 minutes 14 seconds west longitude.

(*k*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 27 minutes 30 seconds north latitude, 132 degrees 8 minutes 40 seconds west longitude.

(*l*) Grindall Island: Within 3,500 feet northwesterly of the eastern extremity of Approach Point.

(*m*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 23 minutes 30 seconds north latitude, 132 degrees 14 minutes west longitude.

(*n*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 22 minutes 15 seconds north latitude, 132 degrees 11 minutes 40 seconds west longitude.

(*o*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 15 minutes 30 seconds north latitude, 131 degrees 59 minutes 30 seconds west longitude.

(*p*) Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 8 minutes 30 seconds north latitude, 132 degrees 2 minutes west longitude.

(*q*) Polk Island: Easterly shore within 2,500 feet of a point at 55 degrees 0 minutes 45 seconds north latitude 131 degrees 58 minutes 45 seconds west longitude.

(*r*) Prince of Wales Island: Within 2,500 feet of a point at 54 degrees 57 minutes 52 seconds north latitude, 131 degrees 58 minutes 30 seconds west longitude.

(*s*) Prince of Wales Island: Within 2,500 feet of a point at 54 degrees 53 minutes 50 seconds north latitude, 131 degrees 58 minutes 30 seconds west longitude.

SOUTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—1. Regulation No. 15 (*a*) is amended to read as follows: San Juan Bautista Island: From a point on the west coast at 55 degrees 25 minutes 45 seconds north latitude southerly and easterly to a point on the south coast at 55 degrees 24 minutes north latitude, 133 degrees 18 minutes 30 seconds west longitude: *Provided,* That in 1931 no trap shall be permitted to operate south of 55 degrees 24 minutes 45 seconds north latitude. A part of these waters is in the North Prince of Wales Island district.

2. Regulation No. 15 (*c*) is amended to read as follows: Baker Island: East coast (1) within 2,500 feet of a point at 55 degrees 20 minutes 50 seconds north latitude, 133 degrees 31 minutes 32 seconds west longitude; and (2) from Point Maria to Point Capones: *Provided,* That in 1931 no trap shall be permitted to operate within 2,500 feet of the point at 55 degrees 20 minutes 50 seconds north latitude, 133 degrees 31 minutes 32 seconds west longitude.

3. Regulation No. 15 (*e*) is amended to read as follows: Prince of Wales Island: Coast from Point Providence to a point on the coast between Tranquil Point and Point Batan at 133 degrees 13 minutes west longitude: *Provided,* That in 1931 no trap shall be permitted to operate south of 55 degrees 21 minutes 50 seconds north latitude.

4. Regulation No. 15 (*f*) is amended to read as follows: Dall Island: East coast from 54 degrees 59 minutes north latitude to 55 degrees 0 minutes 30 seconds north latitude: *Provided,* That in 1931 no trap shall be permitted to operate north of 54 degrees 59 minutes 30 seconds north latitude.

5. Regulation No. 15 (*i*) is amended to read as follows: Sukkwan Island: Southwestern coast from 55 degrees 2 minutes 30 seconds north latitude to the southern extremity of the island, exclusive (a) of the coast from 55 degrees 1 minute 15 seconds north latitude to 55 degrees 0 minutes 45 seconds north latitude, and (b) exclusive of the waters of Kasook Inlet and its tributaries and branches: *Provided,* That in 1931 no trap shall be permitted to operate along the coast between the waters of Kasook Inlet and a point at 55 degrees 0 minutes 45 seconds north latitude, 132 degrees 49 minutes 30 seconds west longitude.

6. Regulation No. 15 (*j*) is amended to read as follows: Prince of Wales Island: From a point at 54 degrees 59 minutes 25 seconds north latitude, 132 degrees 36 minutes 45 seconds west longitude, southerly to a point at 54 degrees 58 minutes 50 seconds north latitude, 132 degrees 36 minutes 55 seconds west longitude, and from Point Webster southeasterly to 54 degrees 54 minutes 45 seconds north latitude, exclusive of the waters of Kassa Inlet and its tributaries and branches: *Provided,* That in 1931 no trap shall be permitted to operate between 54 degrees 56 minutes 40 seconds north latitude and 54 degrees 58 minutes 50 seconds north latitude.

7. Regulation No. 15 (*k*) is amended to read as follows: Ship Islands, Cordova Bay: West coast of the western of the two largest islands of the Ship Islands group and within 300 yards west of the southern extremity of the eastern large island of this group: *Provided,* That in 1931 no trap shall be permitted to operate along the west coast of the western of the two largest islands of the Ship Islands group.

8. Regulation No. 15 (*o*) is amended to read as follows: Prince of Wales Island: From a point near Nichols Bay at 132 degrees 5 minutes west longitude eastward and southward to Cape Chacon at 54 degrees 41 minutes 23 seconds north latitude, 132 degrees 1 minute west longitude: *Provided,* That in 1931 no trap shall operate within 5,500 feet of a point at 54 degrees 42 minutes north latitude and 132 degrees 3 minutes 33 seconds west longitude.

SOUTHERN DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*a*) is amended to read as follows: Cleveland Peninsula: From a point on the east side of Clarence Strait at 55 degrees 44 minutes 7 seconds north latitude, 132 degrees 15 minutes 36 seconds west longitude, southerly to Caamano Point, thence northeasterly to a point at 55 degrees 34 minutes 5 seconds north latitude near the south side of the entrance to Smugglers Cove, exclusive of the east side of Clarence Strait (1) between 132 degrees 2 minutes west longitude and 132 degrees 4 minutes west longitude, (2)

between 55 degrees 33 minutes 30 seconds north latitude and 55 degrees 34 minutes 45 seconds north latitude, (3) between 55 degrees 36 minutes 10 seconds north latitude and 55 degrees 38 minutes north latitude, (4) between 55 degrees 40 minutes north latitude and 55 degrees 41 minutes 10 seconds north latitude, and (5) between 55 degrees 41 minutes 45 seconds north latitude and 55 degrees 43 minutes north latitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 55 degrees 41 minutes 10 seconds north latitude and 55 degrees 41 minutes 45 seconds north latitude, (2) between 55 degrees 38 minutes north latitude and 55 degrees 39 minutes 30 seconds north latitude, and (3) along the shore of Bond Bay. A part of these waters is in the North Prince of Wales Island District.

2. Regulation No. 17 (*c*) is amended to read as follows: Gravina Island: West coast from South Vallenar Point to the southern extremity of Dall Head, including the Bronaugh Islands and the rocky islets adjacent to the west coast of Gravina Island south of South Vallenar Point, exclusive of coast between 55 degrees 13 minutes 15 seconds north latitude and 55 degrees 14 minutes 20 seconds north latitude, and during 1931 exclusive also of the coast between 55 degrees 11 minutes north latitude and 55 degrees 12 minutes 40 seconds north latitude.

3. Regulation No. 17 (*e*) is amended to read as follows: Gravina Island: East coast from Bostwick Point northward to Blank Point at 55 degrees 15 minutes 6 seconds north latitude, 131 degrees 40 minutes 18 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate along the coast herein described.

4. Regulation No. 17 (*l*) is amended to read as follows: Mainland peninsula between Smeaton Bay and Boca de Quadra: From Point Sykes at 55 degrees 11 minutes 36 seconds north latitude, 131 degrees 5 minutes 30 seconds west longitude, southerly and easterly to a point near Quadra Point at 131 degrees west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 55 degrees 8 minutes north latitude and 55 degrees 9 minutes 30 seconds north latitude and (2) south of 55 degrees 6 minutes 50 seconds north latitude.

5. Regulation No. 17 (*p*) is amended to read as follows: Foggy Bay to Cape Fox: From within 1 statute mile northward and eastward of Foggy Point to the southern extremity of Cape Fox, including Cape Fox Island and the western shore of the unnamed island at 54 degrees 47 minutes 26 seconds north latitude, 130 degrees 55 minutes 10 seconds west longitude: *Provided*, That in 1931 no trap will be permitted to operate along the mainland coast between the southern extermity of Cape Fox and 130 degrees 53 minutes west longitude.

6. Regulation No. 17 (*q*) is amended to read as follows: Duke Island: East coast from a point on the north side of Ray Anchorage at 54 degrees 56 minutes 35 seconds north latitude northward to the outer extremity of Flag Point: *Provided*, That in 1931 no trap shall be permitted to operate south of 54 degrees 57 minutes 40 seconds north latitude.

7. Regulation No. 17 (*r*) is amended to read as follows: Duke Island: East coast from a point on the south shore near Kelp Island at 131 degrees 15 minutes 12 seconds west longitude northward to a point on the south side of Ray Anchorage at 131 degrees 13 minutes west longitude: *Provided*, That in 1931 no trap shall be permitted to operate between 54 degrees 53 minutes 10 seconds north latitude and 54 degrees 54 minutes 15 seconds north latitude.

8. Regulation No. 17 (*s*) is amended to read as follows: Duke Island: Southwest coast from a point on the east side of Hall Cove at 54 degrees 53 minutes 24 seconds north latitude to the southern extremity of Cape Northumberland: *Provided*, That in 1931 no trap will be permitted to operate along the coast herein described.

9. Regulation No. 17 (*x*) is amended to read as follows: Kanagunut Island: West coast between the northwestern extremity of the island and Garnet Point, and along the east coast within 2,000 feet of Garnet Point: *Provided*, That in 1931 no trap shall be permitted to operate (1) along the west coast between 54 degrees 43 minutes 58 seconds north latitude and Garnet Point, and (2) north of 54 degrees 44 minutes 20 seconds north latitude.

[*May 19, 1931*]

YUKON-KUSKOKWIM AREA

The Yukon-Kuskokwim area is hereby defined to include all territorial, coastal and tributary waters of Alaska from Cape Newenham northward to the parallel of 66 degrees north latitude.

*Salmon fishery.*—Subject to the limitations and prohibitions effective in the Yukon-Kuskokwim area, commercial fishing for salmon is permitted within a line from Cape Douglas to Cape York, exclusive of all waters inside a line from Point Spencer due north to the opposite shore of Seward Peninsula.

[*June 3, 1931*]

COOK INLET AREA

*Salmon fishery.*—1. Regulation No. 14 (*g*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet from the northern extremity of Point Possession southwesterly to a point at 60 degrees 58 minutes 22 seconds north latitude, 150 degrees 36 minutes 30 seconds west longitude, exclusive of 1 statute mile each side of the mouths of all salmon streams and exclusive of the coast within 1,000 feet of a point at 61 degrees 2 minutes north latitude, 150 degrees 24 minutes 45 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) northerly of a point on the coast 1,000 feet southerly of a point at 61 degrees 2 minutes north latitude, 150 degrees 24 minutes 45 seconds west longitude, and (2) within 2,000 feet of a point on the coast at 60 degrees 58 minutes 55 seconds north latitude, 150 degrees 35 minutes 5 seconds west longitude.

2. Regulation No. 14 (*j*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet (1) from a point north of Boulder Point at 60 degrees 46 minutes 18 seconds north latitude, 151 degrees 15 minutes 40 seconds west longitude, southerly to a point at 60 degrees 44 minutes 1 second north latitude, 151 degrees 19 minutes 58 seconds west longitude; (2) from a point at 60 degrees 43 minutes 44 seconds north latitude, 151 degrees 22 minutes 12 seconds west longitude, southerly to a point at 60 degrees 19 minutes 39 seconds north latitude, 151 degrees 23 minutes 24 seconds west longitude, exclusive of 2½ statute miles each side of the mouth of Kenai River, 2½ statute miles each side of the mouth of Kasilof River, and 1 statute mile each side of the mouths of all other salmon streams; and (3) from a point at 60 degrees 18 minutes 48 seconds north latitude, 151 degrees 23 minutes 20 seconds west longitude, southerly to a point 2 statute miles northward from the mouth of Anchor Point River, exclusive of 2 statute miles each side of the mouth of Ninilchik River, 2 statute miles each side of the mouth of Deep Creek, 1 statute mile each side of the mouths of all other salmon streams, and exclusive of the coast within 6,000 feet of a point at 59 degrees 57 minutes 50 seconds north latitude, 151 degrees 44 minutes 17 seconds west longitude, and of the coast within ½ statute mile of a point at 59 degrees 50 minutes 10 seconds north latitude, 151 degrees 49 minutes 30 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) within 3,500 feet northward of the point 2 statute miles northward from the mouth of Anchor Point River, (2) within 2,500 feet of a point at 59 degrees 54 minutes north latitude, 151 degrees 46 minutes 30 seconds west longitude, (3) within 2,500 feet of a point at 59 degrees 54 minutes 28 seconds north latitude, 151 degrees 46 minutes 8 seconds west longitude, (4) within 2,500 feet of a point at 60 degrees 15 minutes 47 seconds north latitude, 151 degrees 23 minutes 36 seconds west longitude, and (5) within 2,000 feet north of a point on the coast at 60 degrees 13 minutes 15 seconds north latitude.

PRINCE WILLIAM SOUND AREA

*Salmon fishery.*—1. Regulation No. 11 (*g*) is amended to read as follows: Along the mainland within 1 statute mile of the outer extremity of Granite Point, near Fairmont Island: *Provided*, That no trap shall be permitted to operate in 1931.

2. Regulation No. 11 (*dd*) is amended to read as follows: Western coast of Montague Island from the north side of the entrance to Hanning Bay northeasterly to 60 degrees 9 minutes 45 seconds north latitude (as shown on U. S. Coast and Geodetic Survey chart No. 8551): *Provided*, That in 1931 no trap shall be permitted to operate (1) from a point at 60 degrees 1 minute 50 seconds north latitude, 147 degrees 34 minutes 40 seconds west longitude, to a point at 60 degrees 6 minutes 6 seconds north latitude, and (2) from a point at 60 degrees 8 minutes 15 seconds north latitude to a point at 60 degrees 9 minutes 45 seconds north latitude.

## SOUTHEASTERN ALASKA AREA

### ICY STRAIT DISTRICT

*Salmon fishery.*—1. Regulation No. 16 (*b*) is amended to read as follows: Inian Islands: (1) North of 58 degrees 15 minutes 42 seconds north latitude, exclusive of the east end of the northeastern island; and (2) southwest coast of the northwestern island between 58 degrees 15 minutes 42 seconds north latitude and 58 degrees 15 minutes 18 seconds north latitude: *Provided*, That in 1931 no trap shall be operated (1) east of 136 degrees 20 minutes west longitude, and (2) north of 58 degrees 15 minutes 42 seconds north latitude on the coast of the northwesterly island.

2. Regulation No. 16 (*l*) is amended to read as follows: Mainland from a point on the east side of Excursion Inlet at 58 degrees 23 minutes north latitude southward to 135 degrees 8 minutes 40 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 58 degrees 18 minutes 45 seconds north latitude and 58 degrees 16 minutes 55 seconds north latitude, and (2) north of 58 degrees 21 minutes north latitude.

3. Regulation No. 16 (*n*) is amended to read as follows: Chichagof Island: Northeastern coast from a point on the south side of Icy Strait at 135 degrees 2 minutes 40 seconds west longitude easterly to a point at 58 degrees 2 minutes 43 seconds north latitude, 134 degrees 58 minutes west longitude: *Provided*, That in 1931 no trap shall be permitted to operate east of 135 degrees west longitude.

### WESTERN DISTRICT

*Salmon fishery.*—1. Regulation No. 19 (*d*) is amended to read as follows: Chichagof Island: Eastern coast from South Passage Point to Point Hayes, exclusive of (1) Basket Bay and within ½ statute mile of each side of its entrance, and (2) exclusive of the coast from 57 degrees 33 minutes north latitude southerly to 57 degrees 30 minutes 30 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) south of 57 degrees 34 minutes 40 seconds north latitude exclusive of 5,000 feet north of Point Hayes, (2) between 57 degrees 36 minutes 20 seconds north latitude and 57 degrees 38 minutes 28 seconds north latitude, (3) between 57 degrees 42 minutes north latitude and 57 degrees 44 minutes 6 seconds north latitude, and (4) north of 57 degrees 44 minutes 31 seconds north latitude.

2. Regulation No. 19 (*e*) is amended to read as follows: Baranof Island: From a point ½ statute mile south of Point Thatcher to Point Lull, exclusive of the coast between 57 degrees 20 minutes 35 seconds north latitude and 57 degrees 23 minutes 30 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate south of 57 degrees 20 minutes north latitude.

3. Regulation No. 19 (*k*) is amended to read as follows: Admiralty Island: West coast from a point ¾ statute mile north of Parker Point to 58 degrees 2 minutes north latitude, exclusive of the coast (1) between 57 degrees 47 minutes north latitude and 57 degrees 48 minutes 30 seconds north latitude, and (2) between 57 degrees 51 minutes north latitude and 57 degrees 53 minutes 30 seconds north latitude, and during 1931 exclusive also of the coast (1) between 57 degrees 43 minutes 24 seconds north latitude and 57 degrees 46 minutes north latitude, (2) between 57 degrees 53 minutes 30 seconds north latitude and 57 degrees 54 minutes 40 seconds north latitude, and (3) between 57 degrees 55 minutes 45 seconds north latitude and 57 degrees 57 minutes 30 seconds north latitude.

4. Regulation No. 19 (*m*) is amended to read as follows: Admiralty Island: West coast from a point north of Wilson Cove at 57 degrees 10 minutes 30 seconds north latitude to Point Caution, exclusive of the coast (1) between 57 degrees 10 minutes 40 seconds north latitude and 57 degrees 11 minutes 50 seconds north latitude, and (2) between 57 degrees 13 minutes 15 seconds north latitude and 57 degrees 14 minutes 30 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate between 57 degrees 10 minutes 30 seconds north latitude and 57 degrees 10 minutes 40 seconds north latitude.

### EASTERN DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*i*) is amended to read as follows: Admiralty Island: Southeast coast from Point Pybus to False Point Pybus, exclusive of coast between a point at 57 degrees 18 minutes 50 seconds north latitude and a point at 57 degrees 20 minutes north latitude, 133 degrees 55 minutes

west longitude: *Provided*, That in 1931 no trap shall be operated between Point Pybus and a point at 57 degrees 18 minutes 50 seconds north latitude.

2. Regulation No. 17 (*n*) is amended to read as follows: Kuiu Island: Northwest coast from a point 1 statute mile north of the north side of the entrance to Washington Bay northward to the point at the east side of the entrance to Band Cove: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 56 degrees 45 minutes 50 seconds north latitude and 56 degrees 47 minutes 50 seconds north latitude, and (2) between 56 degrees 49 minutes 30 seconds north latitude, 134 degrees 25 minutes west longitude, and 56 degrees 51 minutes 30 seconds north latitude, 134 degrees 24 minutes 40 seconds west longitude.

NORTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*y*) is amended to read as follows: Etolin Island: West coast from 56 degrees 18 minutes north latitude southward to Steamer Point, exclusive of the coast between 132 degrees 38 minutes west longitude and 56 degrees 15 minutes north latitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) north of 56 degrees 15 minutes 15 seconds north latitude, and (2) along the coast between Steamer Point Light and 132 degrees 38 minutes west longitude.

2. Regulation No. 17 (*bb*) is amended to read as follows: Etolin Island: West coast from 56 degrees 4 minutes 30 seconds north latitude southeasterly to 56 degrees 3 minutes north latitude, 132 degrees 38 minutes 54 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate on the west coast of Etolin Island between 56 degrees 3 minutes north latitude and 56 degrees 3 minutes 30 seconds north latitude.

3. Regulation No. 17 (*cc*) is amended to read as follows: West coast of Observation Island, Marsh Island, Screen Islands, and Abraham Island: *Provided*, That in 1931 no trap shall be permitted to operate on the coast of Abraham Island and Screen Islands.

4. Regulation No. 17 (*dd*) is amended to read as follows: East Island: East coast within 2,500 feet of a point at 56 degrees 10 minutes north latitude, 132 degrees 54 minutes 16 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

5. Regulation No. 17 (*ll*) is amended to read as follows: Cleveland Peninsula: West coast from ½ statute mile east of Watkins Point southward to a point 1 statute mile north of Emerald Bay: *Provided*, That in 1931 no trap shall be permitted to operate between 55 degrees 54 minutes 30 seconds north latitude and 55 degrees 57 minutes 15 seconds north latitude.

6. Regulation No. 17 (*zz*) is amended to read as follows: Prince of Wales Island: East coast from McLean Point to a point 3,500 feet southward: *Provided*, That no trap shall be permitted to operate in 1931.

7. Regulation No. 17 (*aaa*) is amended to read as follows: Prince of Wales Island: From a point on Cape Chacon at 54 degrees 41 minutes 23 seconds north latitude, 132 degrees 1 minute west longitude, northerly to a point at approximately 54 degrees 45 minutes north latitude, 132 degrees west longitude: *Provided*, That in 1931 no trap shall operate except within 2,500 feet of a point at 54 degrees 43 minutes 5 seconds north latitude, 132 degrees 0 minutes 54 seconds west longitude.

8. That part of regulation No. 15 in supplement No. 251-17-2 issued March 17, 1931, giving the location of a place ½ statute mile northwest of Luck Point at 55 degrees 52 minutes 25 seconds north latitude is hereby amended to make the location of such place at 55 degrees 59 minutes 25 seconds north latitude.

9. Regulation No. 15 (*a*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 57 minutes north latitude, 132 degrees 41 minutes 59 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

10. Regulation No. 15 (*c*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 54 minutes 28 seconds north latitude, 132 degrees 36 minutes 59 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

11. Regulation No. 15 (*e*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 47 minutes 50 seconds north latitude, 132 degrees 29 minutes west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

12. Regulation No. 15 (*g*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 36 minutes 25 seconds north latitude, 132 degrees 20 minutes 47 seconds west longitude: *Provided*, That no trap will be permitted to operate in 1931.

13. Regulation No. 15 (*h*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 34 minutes 2 seconds north latitude, 132 degrees 18 minutes 42 seconds west longitude: *Provided*, That no trap will be permitted to operate in 1931.

14. Regulation No. 15 (*n*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 22 minutes 15 seconds north latitude, 132 degrees 11 minutes 40 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

15. Regulation No. 15 (*p*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 8 minutes 30 seconds north latitude, 132 degrees 2 minutes west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

16. Regulation No. 15 (*s*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 54 degrees 53 minutes 50 seconds north latitude, 131 degrees 58 minutes 30 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

### SOUTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—1. Regulation No. 15 (*h*) is amended to read as follows: Long Island, east of Dall Island: East and west coasts within 2,500 feet measured along the coast from 54 degrees 46 minutes 15 seconds north latitude: *Provided*, That in 1931 no trap shall be permitted to operate on the east coast of Long Island.

2. Regulation No. 15 (*m*) is amended to read as follows: Prince of Wales Island: South coast within 1,500 feet northeasterly from the extremity of land at 54 degrees 43 minutes 5 seconds north latitude, 132 degrees 13 minutes 35 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

### SOUTHERN DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*a*) is amended to read as follows: Cleveland Peninsula: From a point on the east side of Clarence Strait at 55 degrees 44 minutes 7 seconds north latitude, 132 degrees 15 minutes 36 seconds west longitude, southerly to Caamano Point, thence northeasterly to a point at 55 degrees 34 minutes 5 seconds north latitude near the south side of the entrance to Smugglers Cove, exclusive of the east side of Clarence Strait (1) between 132 degrees 2 minutes west longitude and 132 degrees 4 minutes west longitude, (2) between 55 degrees 33 minutes 30 seconds north latitude and 55 degrees 34 minutes 45 seconds north latitude, (3) between 55 degrees 36 minutes 10 seconds north latitude and 55 degrees 38 minutes north latitude, (4) between 55 degrees 40 minutes north latitude and 55 degrees 41 minutes 10 seconds north latitude, and (5) between 55 degrees 41 minutes 45 seconds north latitude and 55 degrees 43 minutes north latitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 55 degrees 41 minutes 10 seconds north latitude and 55 degrees 41 minutes 45 seconds north latitude, (2) between 55 degrees 38 minutes north latitude and 55 degrees 39 minutes 30 seconds north latitude, (3) along the shore of Bond Bay, and (4) within 2,500 feet of a point at 55 degrees 31 minutes 40 seconds north latitude, 131 degrees 56 minutes 23 seconds west longitude. A part of these waters is in the North Prince of Wales Island District.

2. Regulation No. 17 (*i*) is amended to read as follows: Revillagigedo Island: From Cone Point southeasterly to a point at 55 degrees 11 minutes 36 seconds north latitude, 131 degrees 10 minutes 42 seconds west longitude, including Cone Island: *Provided*, That in 1931 no trap shall be permitted to operate within 2,500 feet of a point at 55 degrees 11 minutes 30 seconds north latitude, 131 degrees 12 minutes 30 seconds west longitude.

3. Regulation No. 17 (*j*) is amended to read as follows: Revillagigedo Island: Within ½ statute mile of Escape Point, within 5,000 feet northwesterly of Indian Point, and within 1⅛ statute miles northeasterly from a point north of Point Higgins at 55 degrees 27 minutes 45 seconds north latitude, 131 degrees 49 minutes 58 seconds west longitude: *Provided*, That in 1931 no trap shall be operated within 5,000 feet northwesterly of Indian Point.

4 Regulation No. 17 (*n*) is amended to read as follows: Mainland south of Boca de Quadra: Within ⅛ statute mile of a point on Kah Shakes Point at 55 degrees 3 minutes 44 seconds north latitude, 130 degrees 59 minutes 30 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

5. Regulation No. 17 (*v*) is amended to read as follows: East Island, east of Kelp Island: Eastern coast between the northern and southern extremities of the island: *Provided*, That no trap shall be permitted to operate in 1931.

6. Regulation No. 17 (*x*) is amended to read as follows: Kanagunut Island: West coast between the northwestern extremity of the island and Garnet Point, and along the east coast within 2,000 feet of Garnet Point: *Provided*, That in 1931 no trap shall be permitted to operate (1) along the west coast between 54 degrees 43 minutes 58 seconds north latitude and Garnet Point, (2) north of 54 degrees 44 minutes 20 seconds north latitude, and (3) on the east coast of Kanagunut Island within 2,000 feet of Garnet Point.

[*June 5, 1931*]

YUKON-KUSKOKWIM AREA

*Salmon fishery.*—Commercial fishing for salmon is permitted within a line from Cape Douglas to Cape York, exclusive of all waters east of 166 degrees 28 minutes west longitude.

PRINCE WILLIAM SOUND AREA

*Herring fishery.*—Commercial fishing for herring, except for bait purposes, is prohibited from 12 o'clock noon of Saturday of each week until 12 o'clock noon of the Monday following.

[*June 29, 1931*]

COOK INLET AREA

*Salmon fishery.*—Regulation No. 14 (*j*) is amended to read as follows: Along the mainland coast on the east side of Cook Inlet (1) from a point north of Boulder Point at 60 degrees 46 minutes 18 seconds north latitude, 151 degrees 15 minutes 40 seconds west longitude, southerly to a point at 60 degrees 44 minutes 1 second north latitude, 151 degrees 19 minutes 58 seconds west longitude; (2) from a point at 60 degrees 43 minutes 44 seconds north latitude, 151 degrees 22 minutes 12 seconds west longitude, southerly to a point at 60 degrees 19 minutes 39 seconds north latitude, 151 degrees 23 minutes 24 seconds west longitude, exclusive of 2½ statute miles each side of the mouth of Kenai River, 2½ statute miles each side of the mouth of Kasilof River, and 1 statute mile each side of the mouths of all other salmon streams; and (3) from a point at 60 degrees 18 minutes 48 seconds north latitude, 151 degrees 23 minutes 20 seconds west longitude, southerly to a point 2 statute miles northward from the mouth of Anchor Point River, exclusive of 2 statute miles each side of the mouth of Ninilchik River, 2 statute miles each side of the mouth of Deep Creek, 1 statute mile each side of the mouths of all other salmon streams, and exclusive of the coast within 6,000 feet of a point at 59 degrees 57 minutes 50 seconds north latitude, 151 degrees 44 minutes 17 seconds west longitude, and of the coast within ½ statute mile of a point at 59 degrees 50 minutes 10 seconds north latitude, 151 degrees 49 minutes 30 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) within 3,500 feet northward of the point 2 statute miles northward from the mouth of Anchor Point River, (2) within 2,500 feet of a point at 59 degrees 54 minutes north latitude, 151 degrees 46 minutes 30 seconds west longitude, (3) within 2,500 feet of a point at 59 degrees 54 minutes 28 seconds north latitude, 151 degrees 46 minutes 8 seconds west longitude, (4) within 2,500 feet of a point at 60 degrees 15 minutes 9 seconds north latitude, 151 degrees 23 minutes 50 seconds west longitude, and (5) within 2,000 feet north of a point on the coast at 60 degrees 13 minutes 15 seconds north latitude.

PRINCE WILLIAM SOUND AREA

*Salmon fishery.*—Regulation No. 11 (*o*), opening the west coast of Goose Island between its northern and southern extremities to trap fishing, is hereby revoked.

SOUTHEASTERN ALASKA AREA

ICY STRAIT DISTRICT

*Salmon fishery.*—Regulation No. 16 (*l*) is amended to read as follows: Mainland from a point on the east side of Excursion Inlet at 58 degrees 23 minutes north latitude southward to 135 degrees 8 minutes 40 seconds west longitude: *Provided*, That in 1931 no trap shall be permitted to operate (1) between 58 degrees 18 minutes 45 seconds north latitude and 58 degrees 16 minutes 55 seconds north latitude, and (2) north of 58 degrees 21 minutes 45 seconds north latitude.

NORTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—1. Regulation No. 17 (*cc*) is amended to read as follows: West coast of Observation Island, Screen Islands, and Abraham Island: *Provided*, That in 1931 no trap shall be permitted to operate on the coast of Abraham Island and the southern island of the Screen Islands group.

2. Regulation No. 15 (*k*), in Supplement No. 251-17-2, is amended to read as follows: Prince of Wales Island: Within 2,500 feet of a point at 55 degrees 27 minutes 30 seconds north latitude, 132 degrees 8 minutes 40 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

[*July 6, 1931*]

COOK INLET AREA

*Salmon fishery.*—All commercial fishing for salmon is prohibited in Kamishak Bay and its tributary waters west of 154 degrees west longitude.

[*July 8, 1931*]

KODIAK AREA

*Salmon fishery.*—1. Regulation No. 18 (*e*) is amended to read as follows: Kodiak Island: Coast from a point on Kupreanof Strait at 152 degrees 58 minutes 12 seconds west longitude westward to a point at 57 degrees 56 minutes 30 seconds north latitude, 153 degrees 0 minutes 22 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

2. Regulation No. 18 (*f*) is amended to read as follows: Kodiak Island: Within 2,500 feet of a point on the coast on the south side of Kupreanof Strait at 57 degrees 57 minutes 46 seconds north latitude, 153 degrees 9 minutes 37 seconds west longitude: *Provided*, That no trap shall be permitted to operate in 1931.

[*July 14, 1931*]

BRISTOL BAY AREA

*Salmon fishery.*—1. Commercial fishing for salmon in the Nushagak district is prohibited from 6 o'clock antemeridian July 15 to 6 o'clock antemeridian August 3.

2. Regulation No. 14 is amended to read as follows: The 36-hour weekly closed period for salmon fishing prescribed by section 5 of the act of June 6, 1924, is hereby extended to include the period from 6 o'clock antemeridian Wednesday to 6 o'clock antemeridian Thursday of each week, making a weekly closed period of 60 hours: *Provided*, That in the Kvichak-Naknek district the weekly closed period shall extend from 6 o'clock antemeridian Wednesday to 6 o'clock postmeridian Thursday and from 6 o'clock postmeridian Saturday to 6 o'clock postmeridian of the Monday following, making a weekly closed period of 84 hours; *Provided further*, That in the waters of Kvichak Bay between the line extending across the bay from the marker on a high point on the east bank of Prosper Creek, about 700 yards above the Koggiung cannery of the Alaska Packers Association, to the marker on the opposite side, the course being about north, 44 degrees west, magnetic, and the line extending at right angles across the bay from a marker at Jensen Creek to a marker on the opposite shore about 1½ miles west of Squaw Creek, the 36-hour weekly closed period for salmon fishing prescribed by section 5 of the act of June 6, 1924, is hereby extended to include the period from 6 o'clock postmeridian of Saturday of each week to 12 o'clock noon of the Tuesday following, and the period from 6 o'clock postmeridian Wednesday to 12 o'clock midnight Thursday of each week, making a weekly closed period of 96 hours.

PRINCE WILLIAM SOUND AREA

*Clam fishery.*—Regulation No. 2 is amended to read as follows: The taking of clams for commercial purposes is prohibited after July 31 in each calendar year.

COPPER RIVER AREA

*Clam fishery.*—Regulation No. 2 is amended to read as follows: The taking of clams for commercial purposes is prohibited after July 31 in each calendar year.

[*July 16, 1931*]

BRISTOL BAY AREA

*Salmon fishery.*—Commercial fishing for salmon in all districts is prohibited in the period from 6 o'clock antemeridian July 22 to 6 o'clock antemeridian August 3.

[*July 24, 1931*]

YUKON-KUSKOKWIM AREA

*Salmon fishery.*—Regulation No. 6 is amended to read as follows: Commercial fishing for salmon is prohibited except in the period from 6 o'clock antemeridian June 5 to 6 o'clock postmeridian July 31, and in the period from 6 o'clock antemeridian August 3 to 6 o'clock postmeridian August 15 in each year.

[*July 31, 1931*]

SOUTHEASTERN ALASKA AREA

NORTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—Regulation No. 17 (*ll*) is amended to read as follows: Cleveland Peninsula: West coast from ½ statute mile east of Watkins Point southward to a point 1 statute mile north of Emerald Bay: *Provided,* That in 1931 no trap shall be permitted to operate between 55 degrees 55 minutes 15 seconds north latitude and 55 degrees 57 minutes 15 seconds north latitude.

[*August 1, 1931*]

PRINCE WILLIAM SOUND AREA

*Salmon fishery.*—Regulation No. 9 is amended to read as follows: Commercial fishing for salmon is prohibited during the remainder of each calendar year after 6 o'clock antemeridian August 5: *Provided,* That this prohibition shall not apply (*a*) to trolling and gill netting through August 15 in the waters along the western coast from the outer point on the north shore of Granite Bay (known as Granite Bay Point) to the light on the south shore of the entrance to Port Nellie Juan, nor (*b*) to trolling in the period from 6 o'clock antemeridian August 5 to 6 o'clock postmeridian September 20 in the waters of Prince William Sound east of 147 degrees west longitude, exclusive of all waters of Valdez Arm north of Point Freemantle. All trap leads from shore to entrance of hearts must be removed prior to 6 o'clock antemeridian August 9.

SOUTHEASTERN ALASKA AREA

ICY STRAIT AND WESTERN DISTRICTS

*Herring fishery.*—Fishing for herring for bait is permitted in the waters of Port Frederick, Chichagof Island, from 6 o'clock antemeridian August 3 to 6 o'clock antemeridian August 7.

[*August 17, 1931*]

SOUTHEASTERN ALASKA AREA

*Herring fishery.*—Regulation No. 4 is amended so as to permit fishing for herring for bait in the waters of Pybus Bay and Seymour Canal from 6 o'clock antemeridian August 18 to 6 o'clock antemeridian August 21.

[*August 18, 1931*]

SOUTHEASTERN ALASKA AREA

ICY STRAIT, WESTERN, EASTERN, NORTH PRINCE OF WALES ISLAND, SOUTH PRINCE OF WALES ISLAND, AND SOUTHERN DISTRICTS

*Salmon fishery.*—The regulation prohibiting commercial fishing for salmon by trolling from 6 o'clock antemeridian August 25 to 6 o'clock postmeridian September 20 is hereby revoked.

[*August 21, 1931*]

SOUTHEASTERN ALASKA AREA

SOUTH PRINCE OF WALES ISLAND DISTRICT

*Salmon fishery.*—Regulation No. 6 is amended to read as follows: Commercial fishing for salmon, other than trolling, is prohibited prior to 6 o'clock antemeridian July 15 in each calendar year, from 6 o'clock postmeridian August 28 to 6 o'clock antemeridian October 1 in each year, and for the remainder of each calendar year after 6 o'clock postmeridian October 15.

[*September 4, 1931*]

SOUTHEASTERN ALASKA AREA

*Herring fishery.*—Fishing for herring for bait in the waters of Wrangell Narrows and the placing of pounds for herring for bait in Scow Bay are permitted for thirty days beginning September 4 and ending at the close of October 3, 1931.

Revised regulations covering the fisheries of Alaska were issued by the Secretary of Commerce under date of December 17, 1931, copies of which may be secured, without cost, on application to the Bureau of Fisheries, Washington, D. C.

## ANNETTE ISLAND FISHERY RESERVE

The Annette Island Packing Co. again operated in the Annette Island Fishery Reserve under its lease from the Department of the Interior.

In 1931 the company operated six traps within the reservation, the catch of which totaled 261,993 salmon; and 2,043 salmon taken in purse seines and gill nets within the reserve were purchased from natives. In addition, 159,198 salmon taken outside the reserve and purchased from natives and other independent operators of seines, gill nets, and traps were packed at the cannery. In the operation of the plant and the fish traps, employment was given to 15 whites and 186 natives.

## STREAM IMPROVEMENT

In connection with the patrol of fishing areas the work of improving and enlarging salmon spawning areas was continued in 1931. Log jams and bowlders were removed from a number of streams, the most noteworthy instance being the improvement of the falls in Karta River, which in the past have hindered the ascent of salmon during dry seasons. A number of large bowlders were removed with dynamite, making a clear passage to the head of the falls through which the salmon passed without effort. Repairs were made to the Ketchikan Creek fishway, which was damaged by débris carried down on the flood waters in the fall of 1930. It was found necessary to build a wing dam above the fishway to maintain a uniform flow of water. Further permanent improvements in this structure are anticipated prior to the spawning migration of 1932.

An inspection of conditions on Anan Creek was made by U. B. Gilroy in July, 1931, with a view to facilitating the ascent of salmon above the second falls. A detailed report with recommendations for improving conditions was submitted, and it is anticipated that the necessary improvements will be made during the low-water period of 1932.

Other improvements consisted in the removal of log jams and débris from Eagle Creek and the stream entering Whale Passage and improvement of the falls in Olive Cove in southeastern Alaska, and in

clearing jams from Quartz Creek, Lost Creek, and Chinik Creek in the Cook Inlet region.

### STREAM MARKING

New markers defining areas closed to commercial fishing were erected to replace those which had become illegible or damaged, and changes were made in the positions of others to conform with changes made in the regulations with respect to closed areas.

### STREAM GUARDS

The bureau employed 220 men in 1931 as stream guards and special workmen in connection with law-enforcement duties. Of these, 110 were stationed in southeastern Alaska, 71 in central, and 39 in western Alaska. Some of the temporary workers were engaged for only a few days, but the period of employment generally ranged from two to five months.

In southeastern Alaska 54 stream watchmen furnished their own launches and were assigned to patrol larger bodies of water or in the vicinity of several streams.

In central Alaska 19 guards were stationed in the Seward-Katalla district, 10 on Cook Inlet, 30 in the Kodiak-Afognak district, 4 at Chignik, and 8 in the Ikatan-Shumagin district. Twelve of these guards, most of whom were in the Seward-Katalla district, provided their own launches.

In western Alaska 36 were on Bristol Bay; and 3, of whom 1 furnished his own boat, were in the Yukon-Kuskokwim district.

There were also 15 special employees engaged in scientific work—3 on herring and 12 on salmon investigations, this work being carried on chiefly in southeastern and central Alaska.

In addition, there were 12 statutory employees, 53 men on the bureau's vessels, and 12 on the 9 chartered boats.

The foregoing makes a grand total of 312 persons identified with fishery-protective work in Alaska in 1931, as compared with 317 in 1930.

### VESSEL PATROL

The bureau maintained a fleet of 15 vessels in Alaska for fishery patrol work in 1931. These vessels were assigned to duty as follows: The *Widgeon*, *Murre*, *Auklet*, and *Petrel* in southeastern Alaska throughout the season; the *Blue Wing* and *Red Wing* in the Kodiak area, where the latter also served as tender for the Afognak hatchery; the *Ibis* in the Chignik area; the *Merganser* in the Ikatan-Shumagin region; and the *Coot* on the Yukon River. The *Scoter*, *Teal*, and *Kittiwake*, which were on patrol duty in Bristol Bay, Cook Inlet, and Prince William Sound, respectively, during the fishing seasons in those localities, augmented the patrol in southeastern Alaska in the fall. The *Crane* and the *Eider* also operated in southeastern Alaska during the fall after their return from duty to the westward, where the former had patrolled in the Alaska Peninsula area for part of the season, while the latter had served both in that region and in the Kodiak area. The *Brant* was used in general supervisory work in southeastern Alaska. The Pribilof Islands tender *Penguin* was used by the commissioner in the inspection of fishery operations in southeastern, central, and western Alaska for a number of weeks, during which period the *Crane* was detailed to the Pribilofs.

In addition to the vessels owned by the Bureau of Fisheries, nine boats were chartered for patrolling fishing areas. The following chartered boats were used: *Bear*, *Chirikov*, *Helen Hinton*, *Lady Luck*, and *Valkyrie* in southeastern Alaska; *Katherine L* and *Prospector* on Copper River and Prince William Sound; *Coyote* in Cook Inlet; and *Auk* at Port Moller.

## AERIAL PATROL

The curtailment of commercial fisheries operations, the abundance of salmon in areas open to commercial fishing, and the consequent lack of incentive for violating the fishery regulations made it unnecessary to maintain the aerial patrol to the same extent as in the preceding year. Flights were made in connection with general supervisory work, and for the purpose of observing spawning grounds, chiefly in the Bristol Bay region. In one instance a plane was used to place a number of employees in an isolated district.

## COMPLAINTS AND PROSECUTIONS

In southeast Alaska three seine boats were seized for illegal fishing in closed waters during the 1931 season. The case against the master and two others aboard the *Estrella*, found fishing in Ward Cove on July 18, was tried before the United States commissioner at Ketchikan and a fine of $50 was imposed, the sentence being suspended until August 17 to allow them time to secure the necessary funds. The masters of the *Reliance* and *Klawack No. 7*, who were arrested on July 29 for fishing inside the markers at Mole Harbor, pleaded guilty before the commissioner at Juneau and paid fines of $125 each.

Masters of the trolling boats *Ace* and *J. Warren*, charged with illegal fishing during weekly closed periods in July, pleaded guilty before the commissioner at Juneau and were fined $100 and $50, respectively. A suspended sentence was given in the latter case, and the fine was paid on September 19. Two gill-net fishermen were arrested for fishing in Ahrnklin Inlet with set gill nets in excess of the specified maximum length and were fined $50 each by the local commissioner. Five herring seine boats—*Lorenz*, *Clermont*, *Tatoosh*, *Teresa S*, and *Edgar C*—were found fishing with seines less than 100 yards from other seines already set for fishing, in violation of section 3 of the act of June 6, 1924. The masters appeared before the commissioner at Juneau, pleaded guilty, and were fined $75 in the case of the *Teresa S*, and $100 in each of the others.

In the southeastern district, also, seizures were made of illegal fishing gear as follows: 50 fathoms of gill net from the trolling boat *Harry Nelson*, a 75-fathom purse seine from the *Iona T-4068*, and small pieces of seine web and gill net from the halibut boat *Schorn*. No fines were imposed, as the gear was not in use at the time the seizures were made and voluntary releases were signed by the owners.

Eleven cases involving violations of the fisheries laws and regulations by 18 individuals were brought before the United States commissioner at Cordova. These included two cases, each against two men and having to do with infringement of the regulations regarding weekly closed periods, that were dismissed because of insufficient evidence. In all other cases, the defendants pleaded guilty as charged and fines were imposed. Seven fishermen in the Copper River area, arrested during the month of June for the use of

anchored gill nets, were assessed fines ranging from $50 to $150 and totaling $550. Another fisherman in this area was apprehended for fishing with a stake net on June 25 in closed waters of King Salmon Slough and was fined $25 on each of two counts. Three salmon fishermen, arrested for fishing in a closed area in Cochrane Bay, one who was found fishing during a weekly closed period in Main Bay, and two clam diggers who took undersized clams were fined $25 each. The salmon and clams which were taken illegally in the Prince William Sound area were sold for $75.90 and $3.20, respectively, and the proceeds were turned over to the Department of Justice.

In the Cook Inlet area four cases were tried before local commissioners, the defendants pleaded guilty, and fines were imposed. These included cases against two men for fishing during weekly closed periods, in one of which a fine of $25 was imposed and paid, and in the other a fine of $50 was assessed, but the defendant refused to pay and was ordered to jail for 25 days. One case against three fishermen who used a beach seine inside markers at the mouth of Seldovia River resulted in a joint fine of $250, which was later reduced to $200 and paid. A fur farmer, charged with willfully and unlawfully maintaining a dam and trap in Cottonwood Creek in violation of section 3 of the act of June 6, 1924, was fined $100.

An anchored gill net considerably in excess of the maximum length permitted, found about 1 mile south of the mouth of Nikolai River, and two set gill nets less than the required distance apart at East Foreland were seized and are being held for condemnation proceedings.

A gill net set for fishing at Twocone Point, Kodiak Island, during a weekly closed period was seized on June 14, and 28 red salmon therein were sold for $6.30. Later the owner was apprehended and taken before the commissioner at Kodiak, where he pleaded guilty and was placed in jail, being unable to pay the fine of $250 which was imposed. O. L. Grimes and 24 Indians under his direction were arrested for fishing near Buskin River during a closed period on August 15. All pleaded guilty before the commissioner at Kodiak, who imposed fines of $250 on the cannery operator and $15 on each of the Indians. A set gill net, found illegally fishing on the evening of September 6 in Uganik Bay, was seized and stored in the bureau's warehouse subject to order of the court. A few salmon taken from it were sold, and the receipts turned over to the commissioner at Kodiak.

Charges of wanton waste of herring were brought against the Kalgin Packing Co. for impounding herring at Akutan and leaving them until they were unfit for use. The company, through its superintendent, pleaded guilty before the commissioner at Unalaska and was fined $500.

In the Bristol Bay area two men (stowaways on the *Otsego* from Seattle) were arrested for fishing for the Bristol Bay Packing Co. during a closed season. They pleaded guilty before the commissioner at Naknek and were fined $25 each, upon payment of which the boat and gear were released to the company.

## TERRITORIAL FISHERY LEGISLATION

During the 1931 session of the Alaska Legislature five bills were passed which have reference to the fisheries of Alaska. Two of these made appropriations for the destruction of hair seals, which in certain

localities are considered as predatory enemies of the salmon and other valuable fishes.

An act approved April 30, 1931, appropriated $25,000 to be expended in improving salmon spawning grounds and destroying predatory enemies of the salmon, under the direction of the Governor of Alaska in cooperation with the Bureau of Fisheries.

Other acts provided for the stocking of lakes and streams in certain parts of Alaska with game fish, including an appropriation of $500 for that purpose, and provided for the bonding of any company or individual applying for a provisional license for prosecuting certain fishery industries where the applicant does not have sufficient real property in the Territory to secure the payment of taxes on such industries.

The Territorial act of May 2, 1929, imposing a license fee of $250 on nonresident troll fishermen and $1 on resident fishermen, was held by the Circuit Court of Appeals for the Ninth Circuit to be in conflict with provisions of the Federal law wherein it is stipulated that no citizen of the United States shall be denied the right to take fish in any area of the waters of Alaska where fishing is permitted by the Secretary of Commerce. That court on November 24, 1930, reversed the decree of the Federal district court in the case of Wood Freeman, president of the Trolling Vessel Owners Association, *v.* the Territory of Alaska, a test case to decide the constitutionality of the act, with instructions to overrule the demurrer and for further proceedings not inconsistent with the opinion of the appellate court. The case was reopened in the United States district court at Juneau, with presentation of arguments on both sides in July, but no decision had been rendered at the close of the year.

## TERRITORIAL LICENSE TAX

Fisheries license taxes were collected by the Territory under the general revenue law of 1921, as amended in 1923, 1925, and 1927. A statement from W. G. Smith, Territorial treasurer, under date of May 2, 1932, gives the collections made to that date for the year 1931. It was stated that collections under the several schedules were fairly complete, although a considerable number of the smaller fisheries companies had not yet made settlement. The outstanding salmon pack taxes, including some gear taxes, amounted to approximately $35,000; while about $2,700 was still to be collected on fish oil and fertilizer.

*Fishery license taxes collected by Territory for fiscal year ended December 31, 1931*

| Schedule | Division No. 1 | Division No. 2 | Division No. 3 | Total |
|---|---|---|---|---|
| Salmon canneries (pack) | $157,795.86 | | $307,406.37 | $465,202.23 |
| Clam canneries | 56.19 | | 194.51 | 250.70 |
| Salteries | 1,826.35 | $42.46 | 1,178.58 | 3,047.39 |
| Cold-storage plants | 700.00 | | 125.00 | 825.00 |
| Fresh-fish dealers | 1,472.45 | | 7.00 | 1,479.45 |
| Fish-oil works and fertilizer and fish-meal plants | 15,443.85 | | 2,189.16 | 17,633.01 |
| Fish traps | 72,961.55 | | 48,209.49 | 121,171.04 |
| Gill nets | 510.00 | 33.00 | 4,593.42 | 5,136.42 |
| Seines | 3,665.00 | | 2,135.00 | 5,800.00 |
| Total | 254,431.25 | 75.46 | 366,038.53 | 620,545.24 |
| Salmon canneries (net income), not possible of segregation as to judicial division | | | | 3,213.73 |
| Total collections | | | | 623,758.97 |

## BRISTOL BAY DISTRICT

The bureau's activities in the Bristol Bay district were continued along the same general lines as in previous years. Agent Dennis Winn again organized the work and supervised it throughout the season, assisted by Wardens Eric D. Fenno and Fred R. Lucas. In addition, 36 temporary employees made up the field crew at Bristol Bay in 1931. Of these, 29 were employed in Seattle and vicinity, 3 had been on duty in the district throughout the previous winter, and 4 were employed locally.

Twenty-six of the Bristol Bay force sailed from Seattle on vessels of the bureau, as follows: 4 on the *Eider*, which left on April 23; 15 on the *Crane;* and 7, including Warden Lucas, on the *Scoter*, both of which sailed north on April 28. The two last-named vessels reached False Pass on May 10, where they were storm bound for two days. On May 12 they took aboard the 4 men who had come north on the *Eider* and continued the journey to Naknek, arriving there on May 15. Two employees were transported to Bristol Bay on a vessel belonging to Libby, McNeill & Libby which sailed from Seattle on May 13; 1, with Agent Dennis Winn, sailed from Portland on May 15 on a vessel of the Pacific American Fisheries; and 1 left Seattle June 1 on a commercial freighter.

Part of the season's supplies was carried on the bureau's vessels; but the heavier shipments, including approximately 125,000 feet of lumber, were sent north on cannery freighters.

At the end of the season 7 men returned to Seattle on the *Victoria*, leaving Bristol Bay the latter part of July; 6 left on the *Scoter*, and 17 on the *Crane*, sailing on August 28. Those on the *Scoter* transferred to a commercial steamer at Ketchikan, as the *Scoter* was assigned to patrol in southeastern Alaska during the fall season. The *Crane* transported all of its passengers to Seattle except one who left at Seward and one at Wrangell.

Agent Dennis Winn left Naknek on August 6, crossing the portage to Iliamna Bay, where he boarded the *Teal* for passage to Seward, whence he traveled by airplane to Cordova. He returned to the Bristol Bay district later to make an aerial survey of the spawning grounds.

Warden Lucas, who fell and fractured his left shoulder blade on August 25, was transported by airplane to the Government hospital at Anchorage, where he remained until September 18, on which date he left for Seward, sailing thence for southeastern Alaska on the S. S. *Yukon*.

Warden Fenno again remained in the Nushagak district over winter to supervise the destruction of trout and the payment of Territorial bounties therefor. William E. Sullivan and C. M. Hatton were assigned to similar work at Becharof Lake and Iliamna Lake, respectively, and Alf. Christensen was stationed as winter watchman of the bureau's property at the marine ways at Naknek.

Mr. Lucas's report on operations during the season is as follows:

### GENERAL REPORT OF SEASON'S OPERATIONS

Before the arrival of the crew from the States, Warden Fenno and the winter watchman at the marine ways had painted nearly all of the bureau's boats and scows. Most of the field crew arrived on May 15 on the *Crane* and *Scoter*, and

the work of overhauling and preparing the boats for launching was begun immediately. Besides the necessary work on the hulls, each engine of the eight launches, as well as of the two power skiffs, was overhauled and adjusted. Supplies and materials brought north on the cannery ships were lightered ashore, and the material was sorted and made ready for transshipment to the various weirs. Work at the weirs was then begun, the installation of the Naknek weir being undertaken first, the crew for which left for the weir camp on June 1.

### PATROL

The *Scoter*, eight small boats, and two power skiffs comprised the patrol fleet for the district. The *Scoter* was used by Agent Winn in general supervision of the entire area, while the small boats traversed specified localities, checking gear to assure compliance with regulations, and collecting data on commercial operations. These boats were assigned to the various sections of Bristol Bay, as follows:

*Ugashik River and Bay.*—Launch *No. 6*, C. M. Hatton and William K. Leise. Launch *No. 8*, Henry McFadden and Stanley C. Tholo, also patrolled in this locality and was used as a tender in connection with Ugashik weir operations.

*Egegik River.*—Launch *No. 4*, Elmer Quistorff and Ralph Overbay.

*Naknek River.*—Launch *No. 2*, Clinton Gross and Claude Bushey.

*Kvichak Bay and River.*—Launch *No. 9*, Alf. Christensen and Oscar Thorene; launch *No. 1*, George I. Adams and Jack Burns, assigned to patrol the upper reaches of the bay and to see that no fishing was done above the limit line; launch *No. 7*, Bertel Johnson and Donald S. Praeger, engaged partly on patrol work and partly as tender for the Kvichak and Naknek weirs.

*Nushagak Bay.*—Launch *No. 3*, Warden Fenno and Wesley Haynes.

Only one violation of the fishery regulations was reported.

The total number of gill-net boats fished in the district in 1931 was 1,059, consisting of 811 operated by the canneries and 248 by independent fishermen—local whites and natives who sold their catches to the canneries. Of the independent boats, 129 were used by white residents and 119 by natives, as compared with 66 by whites and 125 by natives in 1930. The number of commercial stake nets operated increased from 134 in 1930 to 188 in 1931.

### RUNS AND ESCAPEMENT OF SALMON

There was a good run of red salmon in Bristol Bay, especially on the east side from Ugashik River to the Kvichak River. The escapement in the Egegik, Naknek, and Kvichak Rivers was far above the average, as was also that at Ugashik, where the weir count showed the largest escapement since the rack was established in 1926. While the run in the Nushagak River was not as heavy as elsewhere in the bay, there was a fairly good escapement. The bulk of the run at Nushagak struck in on July 4 at the beginning of a weekly closed period. Examination of the important spawning areas tributary to Bristol Bay was made by bureau observers at the close of the fishing season.

### DESTRUCTION OF PREDATORY FISHES

The work on predatory enemies of salmon was continued to the full extent of available funds, part of which were furnished by the Territory and part by canners of the district, who assessed themselves $8,000, to be handled and disbursed under bureau supervision in the same manner as were the Territorial funds. Not only is this work of recognized benefit to the future of the salmon industry, but it contributes immeasurably to the support and welfare of the local residents. Nearly all of the Bristol Bay population engaged in the predatory activities, so that it was necessary for the bureau to fix a limit for each subdistrict, in accordance with funds available, and when the limit was reached to discontinue the work. The entire quota was 405,000 predatory fish, and of this number 339,748 were reported taken in 1931. The remainder of the quota will be taken during the winter months from the Naknek and Ugashik areas, which were the only sections that had not reached the number allotted them. Representatives of the bureau have supervised the predatory work and the improvement of the salmon spawning grounds in the Bristol Bay region throughout the year, continuing individual activities after the special funds for the payment of local inhabitants were exhausted.

## INSPECTION OF SPAWNING AREAS

### WOOD RIVER DISTRICT

Observations made by Warden Eric D. Fenno showed that the escapement of salmon to the spawning grounds in the Wood River Lakes district was sufficient to seed these areas in fairly good quantities. There was less than even a fair number of salmon on the beds of the first lake, but on the upper lakes they were fairly plentiful, although somewhat fewer than in a good average year. It was estimated that for the entire watershed the escapement was about 60 per cent of that for an average normal year.

It was believed that the escapement was nearly sufficient for the amount of spawning area, for the water level of the lakes was almost as low as in the summer of 1926. This condition reduces to a great extent the amount of spawning area. However, there was little danger of a loss of spawn, as the fall rains had commenced raising the water level of the lakes.

There was a good escapement of red salmon into Igushik and Snake Rivers.

### ILIAMNA AND LAKE CLARK DISTRICT

The following report was made by C. M. Hatton covering his investigation of the Iliamna and Lake Clark spawning areas in August and September:

Approximately 4,700 salmon were estimated in Tommy Point Creek on August 13, this total including both live and dead fish. Many trout were observed in the stream.

From August 14 to August 16 an examination was made of Iliamna River from Japanese Point near its mouth to about 1 mile above the forks. The counts of salmon made on the above dates totaled 70,600. There were 43 large schools ranging in size from 150 to 3,800 fish. An estimate of 2,500 was made for the number of salmon farther up the river. All tributary creeks and sloughs were filled to capacity and particularly the Chinklegash and Old Williams Creek. Numerous dead salmon were noted on the spawning areas. Only a very few trout were seen.

On August 24 another visit was made to Iliamna River. On this date salmon were seen jumping and finning outside the river mouth, and in the river large schools of bright salmon were observed. Information obtained from white and native residents was to the effect that on August 21 this run of salmon arrived at the mouth of the river. On August 24 the fish had ascended the river only as far as the village. The estimated number of salmon from the mouth of the river to Iliamna village was placed at 25,000. The total estimated escapement for the river was 95,600. The exceptionally low water-level of the river during this period will probably insure better hatching conditions in the spring. It was the current opinion of the residents that the run was the best since the seasons of 1917 and 1919.

On August 25 an examination was made of the two creeks at the head of Pile Bay. These creeks have their sources in small lakes. Ponds are formed by the union of the creeks a short distance from the head of the bay. The creek to the right of the ponds is short, sluggish, and of a swampy nature. The spawning beds are not extensive; in fact, not over a quarter of a mile of the stream bed is available for seeding, and the lake at the head of the creek is inaccessible to salmon. Many trout were noted. There were counted 1,731 salmon spawning in the creek and 150 dead and spent ones. The creek to the left of the ponds is much larger than the other tributary, extending a distance of about 3 miles to the lake at its source, and it affords splendid gravelly areas for seeding purposes. The number of salmon counted in this stream was 14,100, and it was believed that as many more were present that could not be counted. Trout were plentiful.

Pile River also was examined on August 25. Considerable difficulty was encountered in estimating the number of spawning salmon, for the water of this river is of glacial origin and laden with silt. The estimated escapement was 8,500, which is believed to be an average escapement here.

An examination of Pedro Creek and Pedro Bay was made on August 16. Many of the shallow spring ponds of the stream were filled with spawning salmon, as was the case in practically the entire stream. Hundreds of sea gulls were noted eating salmon eggs in the shallow ponds. The escapement to this stream was estimated at 120,000. No trout were noted during the inspection. It is the opinion of the residents at Pedro Bay that this season was on a par with 1918 and 1922 and better than any run since those years.

Knudson Bay Creek was visited on August 26. Approximately 3,100 salmon were in the stream and 16,000 in the bay at the stream mouth. No dead or spent salmon were found in the creek. It is the belief of a local resident that the escapement of salmon to Knudson Bay this season was the best ever experienced.

The examination of Kinney Creek was made on August 28. Along the shore from Kinney's cabin on Knudson Bay to the mouth of the creek there were approximately 12,000 salmon. Just inside the stream mouth was a large school of fish numbering about 9,000 that extended into a slough at the right of the mouth. The stream was examined for an approximate distance of 6 miles. Schools of salmon were not numerous, but the river bottom was amply covered with spawning salmon. The total number of salmon in the stream, including both spawning and spent fish, was estimated at 112,200.

Kokotano and Canyon Creeks were examined, and good escapements were found in both creeks. It is believed that in the area from and including Kinney Creek in Knudson Bay to and including Eagle Bay Creek, there were well over a million spawning salmon. The waters of all creeks and bays were unfit for drinking purposes. Dead salmon lined the shores of lakes and the banks of streams. Sea gulls and ducks were so full of feed that they were scarcely able to fly. It is the general belief among the local inhabitants that the run of fish this season was about on a par with the best years in the past.

The examination of the Lake Clark system was begun on September 3. Several hundred salmon were noted in the upper ponds of Roadhouse Creek. In the Newhalen River a continual school of fish was seen from the landing to Big Lake Clark. The water was very discolored, and it was impossible to estimate the number of salmon; but there appeared to be thousands on their journey to the upper spawning grounds. Natives and white residents of Nondalton stated that this has been the largest salmon escapement in the district to their knowledge, not excepting 1917, 1918, or 1922. All the sloughs and tributary creeks were filled with milling salmon. The portion of the lake that fronts Nondalton was alive with salmon, and it was reported that this condition had existed since late July. All the residents had prepared their supplies of dried fish. The water in the river was unpleasant to the taste, and as fish were continually arriving it would soon be unfit for drinking purposes.

On the morning of September 4 departure was made from Nondalton to Tarnalia Point. Salmon were in evidence the entire distance. A trip was then made over the portage to the falls below Brooks Lake. According to local residents it has been observed that fish school below the falls in considerable numbers during good years, but salmon have never been known to ascend the falls. No salmon were observed below the falls or in the three forks of the river. At the mouth of each branch, and extending for long distances on each side, large schools of salmon were noted. The entire shore line from Nondalton to Little Lake Clark, with but few exceptions, is a vast spawning area.

The inspection was continued to Kijik Lake on the following day, via Kijik Portage. Red salmon were schooled at the mouths of the three creeks at the head of the lake. The estimated escapement to these streams was placed at 18,000. The fish had not acquired the reddish tinge that is associated with spawning activities. Although good numbers of salmon were seen at the entrances of these creeks, only a very few were in evidence in their main courses. Approximately 50 salmon were seen at the mouth of Kijik River. The salmon had not ascended into the river at the time of the inspection. On the same day the small creek located about a mile below Kijik River was examined. Approximately 160 bright salmon, with a few dead ones, were found in the creek.

On the morning of September 6 observations were made at Big River, and as no fish were found there the trip was continued to the stream at the head of Little Lake Clark. Here, as at Big River, salmon had not yet arrived. The immediate mouth of the stream is not very suitable for spawning, but the river proper affords ideal seeding area. It was felt that this inspection was made approximately three weeks too early, for on the morning of September 7 about 50 salmon were seen leaping in the air at the lower end of Little Lake Clark, which appeared as bright

and green as the fish when they first arrive in Bristol Bay. The journey was continued to Current Creek, and no salmon were passed en route, with the exception of the few mentioned above. The spawning ponds and sloughs of Current Creek were barren of salmon. A broken shaft on the outboard motor made it necessary to row to Tarnalia Point, where repairs were made. On September 9 the trip was resumed to Pickerel Creek, which is located just above the islands between Nondalton Lake and Lake Clark proper. An immense beaver dam forms an obstruction to the ascending salmon, thus cutting off considerable spawning area. Hundreds of salmon were noted below the dam. The trip of inspection was concluded at Roadhouse Portage, Lake Iliamna.

The water level of Lake Clark and its tributaries was the lowest that has ever been witnessed by the oldest inhabitants at this particular time of the year.

The run of salmon from Kijik to the head of the lake was far behind its usual time, the first salmon appearing at Tarnalia Point on June 13 and at Kijik on July 16.

Natives from Kokhonak reported that the streams in Kokhonak Bay were well populated with salmon, and the lake at the head of Kokhonak Creek was filled to capacity, as were the tributaries thereto. It was also reported that Belinda Creek had a very good escapement of fish.

### AERIAL SURVEY

During the 1931 season an aerial survey of the spawning grounds was made for the first time in the Bristol Bay area. While the results accomplished were not wholly satisfactory, due to unfavorable weather conditions, they were sufficient to indicate the possibilities offered by this means of travel if a plane were available to make the trip at appropriate times and if stops could be made when the examiner found it desirable to make additional investigations on foot. The advantages of aircraft for obtaining a complete check on all important salmon spawning areas, as well as a means of control over the patrol of any large district, are obvious.

Mr. Winn's report on the aerial survey is as follows:

On August 19 departure was taken from Cordova to Bristol Bay on the seaplane *Ketchikan* of the Alaska-Washington Airways (Inc.). Routing was made over Jackpot Bay and the northern end of Port Bainbridge, Prince William Sound, to ascertain the relative position and importance of the lakes in these areas in association with future weir installation. Travel was continued to Iliamna and then to the bureau's marine ways at Naknek.

On the following day Warden Fenno accompanied the writer on the aerial inspection trip. The plane circled the Naknek Lake series, passing over Naknek Lake to the Bay of Isles, then into Lake Grosvenor, and up Coville Lake to the stream at its head. This stream was well supplied with fish. Good numbers of salmon were noted in the mouth of the stream that is located about midway on the north shore of Naknek Lake. Fair numbers were observed also along the north shores of Grosvenor and Coville Lakes. The fog ceiling lowered to such a degree during the flight that flying was confined to very low altitudes, thereby making estimates of the escapement impossible except during short intervals when the fog lifted and ascent could be made to a higher level. The course continued down Savonski River into Iliuk Arm, thence to Kittiwake Creek, and into Brooks Lake. There was a heavy escapement into the creek, and a schooling of salmon at the outlet of Brooks Lake indicated that apparently the fish had just passed up from Naknek Lake. Brooks Lake was circled, and only one fairly large school of red salmon was seen along the shore, this being at the head of the lake. An endeavor was made to fly into Becharof Lake, headwaters of Ugashik River, but heavy banks of fog between the mountains forced a retreat to water safety. A landing was made in Kukaklek Lake, one of the Lockanok series. Due to continued interference by fog a return was made to Naknek. The escapement of salmon, while better than fair, was not considered sufficient for maximum seeding, for more salmon could be accommodated on the vacant spawning areas in the Naknek Lake system.

Weather conditions improved and a take-off was made for Snag Point, on Nushagak River, in the early afternoon. It required 45 minutes to cover the distance of approximately 70 miles. The trip was then resumed to the Wood River and Tikchik Lakes. The five Wood River lakes were circled and fair num-

bers of red salmon were noted spawning at the mouths of various tributaries and along the shores of each lake. An accurate estimate of the number of fish was impossible because of the fog. However, it was observed that the upper lakes contained most of the spawners. Local inhabitants were engaged in the destruction of the predatory enemies of salmon on each lake.

The flight was then continued to the Tikchik Lake series. Fair numbers of salmon were seen along the shores of the first two lakes but none in the upper lakes. There are 5 lakes in the Tikchik chain, 3 large ones and 2 small connecting lakes. Fog interfered with all but the close-up observations; and these were not satisfactory, as flying so low made it difficult at times to see the fish. The spawning possibilities in the upper lakes appeared very limited, as only the heads of these lakes are favorable for seeding areas. It was planned to cross over to the Mulchatna and Upper Nushagak Rivers, but this plan was frustrated by continued fog which hindered observations and made flying hazardous, necessitating a return to Snag Point. Judging from the aerial observations, there appeared to be a fair escapement.

As it was learned that weather conditions such as were encountered usually prevail for about a week or 10 days, and as indications pointed to such a continuation, it was deemed advisable to leave the district without visiting the Igushik and Snake River lakes. Warden Fenno remained in the Nushagak district for fall and winter work.

The survey was continued on August 21, departure being made from Snag Point for the eastern shore of Bristol Bay. In crossing over to Kvichak Bay the plane passed through a dense bank of fog. Lockanok River was reached and followed for about 60 miles in a direct line, the stream being about 100 miles in length as it meanders to the lake at its source. This river is composed of numerous small channels in its upper reaches, covering a vast territory of lowland, which makes it extremely difficult to reach the lake by boat from Bristol Bay. The river separates into two branches near its head, the branches rising from lakes that lie parallel to each other. These lakes are of good proportions, and at the head of each a narrow neck of water circles around the bases of the mountains. Observations farther inland were prevented by the fog. A landing was made in Lake Grant which is the upper one of the two lakes. No fish were seen during the flight, as conditions were unfavorable for proper examination.

The trip was continued to Lake Iliamna. The inspection of Belinda Creek was unsuccessful as it was necessary to fly at such low altitudes. A temporary lift of the fog enabled an examination to be made of a small portion of Kokhonak Creek. A good escapement was noted near and inside the river mouth and for about a mile up the river. An examination of the lake at the head of Kokhonak Creek, the lakes tributary to Kokhonak River, and the upper reaches of Copper River was impossible due to weather conditions. No information was obtained on the lower reaches of Copper River because of poor visibility. The flight was continued to Roadhouse Portage across Iliamna Lake. It had been planned to survey Lake Clark and its tributaries from this point, but as weather conditions were unfavorable it was felt that nothing could be achieved by continuing the aerial observations. Weather reports indicated no signs of improvement, so a return was made to the base at Cordova. The total number of miles covered on the trip was approximately 2,000.

### GENERAL SUMMARY

From observations made by bureau employees over the entire district Mr. Winn summarizes the situation as follows:

The escapement into the Naknek Lake series was the most satisfactory for several years. The bureau has maintained a counting weir in the Naknek River since 1929, which shows the improvement in the salmon run as follows: In 1929, the escapement was 561,916; in 1930, 287,208; and in 1931, 1,117,629. Observations by airplane of the spawning grounds indicate that a much greater number can be accommodated for maximum seeding efficiency.

The Ugashik district received one of the heaviest escapements of red salmon in its history. The records of escapement through the counting weir maintained in the Ugashik River since 1926 had shown a discouraging decline up to the current year. The escapement of 1931 was far ahead of that of the corresponding cycle in 1926, which is an encouraging indication for the future. The weir counts for six consecutive years are as follows: In 1926, 786,775; in 1927, 443,283; in 1928, 202,966; in 1929, 147,513; in 1930, 168,988; and in 1931, 1,379,623.

The movement of fish in the Iliamna-Lake Clark district resembled that of 1926, when the major portion of the escapement passed into streams along the north

shore of Iliamna Lake and into Newhalen River en route to Lake Clark and its tributaries. Observations of prior years always showed that spawning was late in Big and Little Lakes Clark.

The bureau representative at Becharof, after a preliminary examination, reported the best escapement in Becharof Lake that has occurred during the past three years. The stream guard at Egegik reported a steady escapement during the season in fair proportion to the commercial catch. A very heavy escapement was noted about the middle of the commercial season when the writer made a personal examination of the river as far as the lake.

The escapement along the west shore was excellent in proportion to the extent of the run. At Nushagak the escapement was better than in fair average years, while the Igushik and Snake River Lakes received the best run that has occurred for the past 11 years. The increase in escapement into these lakes each year is one of the most gratifying conditions noted in the bureau's work in Bristol Bay.

Considering the escapement for the district as a whole, a heavy increase is shown over the corresponding cycles. It is felt that the predatory work that has been carried on by the bureau in cooperation with the Territory and the Bristol Bay canners has been an important factor in this increase. The movements of fish in localities along the east shore correspond with the 1926 cycle, but the extent of escapement this year was far greater than that of 1926, with the single exception of Egegik, which harbored an excess of spawners in that year. The escapement at Egegik in 1931, although less than in 1926, was considered adequate for efficient seeding.

## KUSKOKWIM RIVER

From the early part of June to the end of August the Kuskokwim River area was patrolled by Stream Guard Charles McGonagall with a chartered launch.

A limited amount of fishing for export was carried on in June and July off the mouth of the river, one company putting up a quantity of mild-cured king salmon, and two outfits preparing pickled kings and reds. The sides and backs of the salmon used for pickling were used by the natives camped near the salteries.

Taking the season as a whole, the runs of reds, chums, and cohos were the lightest that the Kuskokwim River has had for years. The king run was fairly good, but little effort was made by the natives to catch kings, as they prefer the smaller fish for dog feed.

Three hundred and eighteen natives fished in the river for local requirements, using 638 gill nets of 9,570 fathoms, 38 wheels, and a number of small boats. The products consisted of 253 tons of dried chums.

## YUKON RIVER

Since 1925 commercial fishing in the Yukon area for export from Alaska has been prohibited, the only operations being carried on for local requirements and to supply the market for dried salmon throughout the interior of Alaska. The demand for dried salmon, however, has lessened greatly in recent years, since the dog teams have been replaced by aircraft in the mail service. Therefore the regulations issued in December, 1931, to be effective in the following year, have been modified to permit limited commercial fishing off the mouth of the Yukon.

Inspector C. F. Townsend and one stream guard were again on duty at the fishing grounds throughout the season, patrolling the district on the *Coot*. Departure was made on May 21 from Nenana for the mouth of the river. Spring was late, and snowstorms and blizzards were encountered all the way to Holy Cross. In the lower river region there was no rain through June, July, and part of August, an unusual condition for that part of the country, and nearly all of the dog feed

was sun-cured without any smoke. Above Anvik to the headwaters of the Yukon and Tanana, however, it rained almost continuously during the summer and both rivers were at flood stage most of the time the salmon run was on.

The first king salmon were caught at the mouth of the river on May 31. The big run started on June 10 and continued through July 15. In the last few years the catch of kings has been made chiefly in the south mouth of the river, but this season the main run came through Kwiguk Slough. The run of chums started June 15 and continued in very large numbers to July 25. Many beluga whales and hair seals were observed in the river during this time. A second run of chum salmon occurred from August 10 to the end of the month. There was virtually no September run in any part of the river.

Products of the Yukon and Tanana fisheries were as follows: 233 cases of kings canned; 12,940 pounds of kings and 4,510 pounds of chums pickled; 576 pounds of beleke from kings; 700 pounds of kippered kings; and 367 tons of dried chums. Apparatus consisted of 221 wheels, 151 gill nets of 1,022 fathoms, 1 power dory, 4 gill-net boats, and miscellaneous small boats. There were 12 whites and 300 natives engaged in the fishery.

## WEIRS FOR COUNTING SALMON ESCAPEMENT

The counting of salmon that ascend particular streams to spawn has long been recognized as an invaluable aid in the study of the life history of these fish, as well as providing a means of regulating the commercial catch to insure an adequate escapement of brood fish to the spawning grounds. Weirs for this purpose were operated in 27 of the more important salmon streams of Alaska in 1931, an increase of one over the number operated in the previous year. Of these, 9 were in southeastern, 15 in central, and 3 in western Alaska.

The weir work was extended to the Prince William Sound district for the first time in 1931, two new racks being installed in tributaries of Eshamy and Olsen Bays. A new weir also was established in Nutkwa Creek to take the place of that operated in 1930 in Keete Creek near by. The Kvichak weir in the Bristol Bay region, which was included among those maintained in 1930, was not operated in 1931, although considerable work was done in assembling materials at a new site in preparation for a weir count in the following season.

Reports of operations of the various weirs and of the counts of salmon in 1931 are as follows:

### ANAN CREEK

The weir at Anan Creek was installed approximately a quarter of a mile upstream from the old weir site, at a point about 200 yards above the second or main falls. This change in location necessitated considerable additional work in assembling and transporting supplies and materials, clearing a trail and building a board walk from the salt-water landing to the new weir site, and establishing a camp for weir men. The weir was completed on June 5; and the first count was made on June 7, when 23 steelheads were tallied.

Pink salmon began to pass upstream on June 17. The main run occurred in the period from July 6 to July 18, reaching its peak on July 15, when 31,906 pinks passed through the weir. A second good

showing appeared from July 26 to August 1, after which the run declined gradually until September 1, when counting operations were discontinued because high water made it necessary to keep the gates open to prevent damage to the weir structure. During the season there were counted 613,598 pink salmon, or nearly 50,000 more than the escapement in 1930, the previous record year since the weir was first operated in 1925. In addition to the pink salmon, 1,206 cohos, 42 kings, 31 reds, 27 chums, and 172 steelheads were counted. Several thousand salmon, chiefly pinks, passed upstream after counting ceased. Walter J. Larson was in charge of operations at this weir, under the supervision of Assistant Agent S. A. Baker.

### CALDER CREEK

Construction of the weir at Calder Creek was completed on July 5 at a point 150 feet downstream from the former location. Salmon ascended the stream very late; and it was August 10 before the first count was made, although large schools had been in the shoal water of the bay for two weeks. Heavy rains occured on August 22, and the bulk of the run passed upstream during the following week. Counting was continued through September 23, when the total escapement numbered 31,959 pinks, 17,125 chums, and 193 cohos. Approximately 12,000 salmon were in the creek below the weir at the time the structure was removed. Operation of the weir was in charge of Richard Emery and supervised by Warden C. L. Olson.

### EAGLE CREEK

Work of installing the weir at Eagle Creek was begun on July 1 and completed on July 4. A few red salmon were observed at the mouth of the creek on June 29, but they did not begin to pass upstream until July 5. The first pink salmon were observed off the mouth of the creek on August 1 and began to pass through the weir on August 7, although very few in number until August 19. The heaviest run took place between August 23 and September 11, reaching its peak on August 28, on which date there was an escapement of 61,110 pinks. The total count for the season numbered 532,678 pinks, 49,802 chums, 17,414 reds, and 3,313 cohos. In addition, it was estimated that 50,000 salmon (45,000 pinks, 4,500 chums, and 500 cohos) passed upstream during the period of high water on September 5 and 6, when no count was possible. Also, at the time of the removal of the weir on September 29 there were approximately 22,000 pinks and 25,000 chums that had not ascended to the spawning grounds. As in previous years, the count was made by J. A. Kelly under the direction of Assistant Agent S. A. Baker.

### KLAWAK CREEK

A weir for counting the escapement of spawning salmon in Klawak Creek was established at the same location as in the preceding year, construction being started May 31 and completed June 4. Red salmon began to pass through the counting gates on June 5. While the run of this species was never heavy, it was fairly steady throughout July and August, and the total escapement was considerably larger than for the past several years. The first pink salmon appeared at the weir

on July 26, but no appreciable numbers were tallied until August 11. A count of 96,060 pinks on August 28 marked the peak of the run. Counting was continued through October 10, when the total escapement numbered 535,748 pinks, 151,543 chums, 34,184 reds, and 6,322 cohos. Ernest Petry had charge of counting operations, under the direction of Warden C. L. Olson.

### NUTKWA CREEK

A weir was put into operation this year for the first time in the stream at the head of Nutkwa Inlet, at a point about three-fourths of a mile above the lagoon, where the stream is 130 feet wide and from 1 to 4 feet deep. Considerable difficulty attended the transportation of material to the weir site, as the lumber and other material had to be made up into small rafts and lined through Nutkwa Rapids, then towed 5 miles to the head of Nutkwa Lagoon, thereafter carried around log-jams, and again made into rafts for towing upstream. The weir structure and camp for the watchmen were completed before any salmon appeared in the stream.

The first salmon passed through the gates on July 27 but they were very few in number until August 16, and throughout the season the count was light. Exceptionally high and swift water, with consequent washing of the sandy stream bed, caused the weir to settle and break on September 5. The water level remained high for a week, and it was September 15 before the rack could be replaced. During this period the salmon run was at its best, and it was estimated that approximately 40,000 pinks, 1,000 cohos, and 9,000 chums ascended while the weir was out. Counting was continued through September 27, when the total count numbered 35,565 pinks, 9,763 chums, 2,653 cohos, and 83 reds. Anton Rex had charge of the weir construction and of counting operations, under the supervision of Warden C. L. Olson.

### OLIVE COVE

The work of erecting the Olive Cove weir, including the clearing of the trail, the transportation of lumber and materials, and the building of a ⅜-mile board walk from the salt water landing to the weir site, was carried on from June 6 to June 30. In this period, also, a special inclosure, 15 by 32 feet, was built, as in the preceding year, to hold approximately 800 salmon for scientific study during the season.

A few salmon were observed in the bay on June 30, and some were in the stream below the falls on July 2, but the first to be counted through the weir were 350 pinks on July 9. The bulk of the run passed upstream in July, the highest tally for any one day being 10,108 pink salmon on July 24. Counting was continued through September 5, when the total escapement for the season consisted of 113,689 pinks, 406 cohos, 389 chums, and 2 reds. Walter Campen was in charge of operations at this weir under the direction of Assistant Agent S. A. Baker.

### STANEY CREEK

Construction of the Staney Creek weir was begun on July 1 and completed on July 8. The location of the structure was moved from the former site to a point upstream where the wider stream bed and

deeper water would lessen the pressure of the current during rainy periods. Here the stream is 210 feet wide and has an average depth of 3 feet. Several times during the season heavy rains raised the water to a depth of 9 feet. Unlike the condition in the majority of streams in southeastern Alaska, the escapement into Staney Creek showed a heavy decline from that of the previous year and was insufficient for seeding the spawning beds. Counting of salmon was begun on July 10 and continued through September 17, when the total escapement numbered 17,667 pinks, 8,328 chums, and 2,188 cohos. Counting operations were in charge of Ed Nordlund, under supervision of Warden C. L. Olson.

### WHALE PASSAGE

Construction of the Whale Passage weir was begun on July 2 and completed on July 9. The first count was made on July 10, when 54 cohos passed through the rack. Pink salmon began to ascend on July 30, but no appreciable numbers appeared until August 11. The main run of pink salmon was from August 22 to September 1, the peak being reached on August 27, with a count of 51,827 for that day. A second good showing occurred between September 9 and 14, after which there was a gradual decline until counting was discontinued on September 28. The total escapement consisted of 508,818 pink salmon, 19,516 cohos, and 68,617 chums. It was estimated that 35,000 pinks, 1,000 cohos, and 500 chums were in the stream below the weir at the time the structure was removed. The work at this place was under the supervision of Assistant Agent S. A. Baker, with Charles Nelson in charge of counting operations until August 22 and Frank Reed thereafter until the end of the season.

### SITUK RIVER

Installation of the weir at Situk River was completed on June 10. Counting began on June 14 and was continued through August 15, when the weir was put out of commission by high water. Several times during the season it was necessary to extend the weekly closed period for 18 or 24 hours in order to permit an escapement of at least 50 per cent of the run to the spawning grounds. The total number of salmon tallied during the season numbered 270,850 reds, 64,253 pinks, 2,967 kings, and 42 cohos. In addition, it was estimated that there was an escapement of approximately 30,000 red salmon following the suspension of weir operations. Warden Harry A. Pryde supervised the work at this place.

### ESHAMY RIVER

The counting of salmon at Eshamy River was begun in 1931 by the establishment of a weir about 800 feet from the mouth of the river. The structure was of the usual tripod type, with two counting gates. Counting began on July 7 and continued through September 30, when the total escapement numbered 78,980 reds, 4,741 cohos, 6,157 pinks, and 16 kings. The work at this place was in charge of Jack Harris, under the direction of Warden N. O. Hardy.

### OLSEN BAY

A new 120-foot weir of the tripod type was put into operation for the first time this year in the stream at the head of Olsen Bay. The rack was completed on June 7, but it was not until June 28 that the salmon

began to pass upstream. On that date eight chums were counted, the run continuing in small numbers thereafter until the early part of September. Although 4 pink salmon passed through the gates on July 6, it was not until 20 days later that the next count was made, and no appreciable numbers appeared until August 13. As a large school of pink salmon was noted inside the stream markers on July 25, it is evident that the fish spend considerable time in brackish water at the mouths of streams before they begin to ascend. The weir was maintained through September 15, when the total escapement numbered 27,506 pink salmon, 3,821 chums, and 11 cohos. Robert Rogers acted as operator of the weir and stream guard of the Olsen Bay area, under the supervision of Warden N. O. Hardy.

### KARLUK RIVER

The erection of the Karluk weir was begun on May 6; and although attended with some difficulty because of high water, it was completed on May 14. The first red salmon were observed below the weir on May 19, but they did not begin to pass through the counting gates until May 24. Counting was continued through October 8, when the total escapement was 873,428 red salmon, 3,303 kings, 9,050 cohos, and 43,496 pinks. A few reds, cohos, and steelheads were still in the lagoon at the time the weir operations were suspended and the structure was removed.

Commercial fishing for salmon in Karluk waters began on June 6 and closed on September 28. The reported commercial catch of red salmon from the Karluk run was 692,786, or approximately 44 per cent of the total.

The first red-salmon fingerlings migrating downstream were noted on May 21, the migration continuing through June. Fifty thousand of these fingerlings were marked for scientific study. Efforts to exterminate predatory fishes were curtailed by high water and by the presence of large numbers of red-salmon migrants, but some 3,000 Dolly Varden trout were caught with a seine during the season.

Counting operations at the weir were in charge of Ray S. Wood, under the direction of Warden H. H. Hungerford.

### ALITAK BAY

Weirs for counting the escapement of spawning salmon in the Alitak Bay region were again operated in four streams tributary to Olga Bay. The weir at the cannery station was completed on May 7, that at the upper station on May 11, the Horse Marine Lagoon weir on May 21, and the Silver Salmon Creek weir on June 30. Traps for the capture of Dolly Varden trout were installed at all weirs, and small seines and hand lines also were used from time to time in this work, resulting in the take of 67,304 of these predatory fishes during the season.

Red salmon began to appear at the cannery station weir on May 23, and at the upper station on the following day, while at the other weirs no salmon were tallied until nearly the middle of July. The run at Silver Salmon Creek was very light and of short duration. As heretofore, the bulk of the red-salmon escapement passed through the upper station weir, where the run reached its peak on August 30, with a tally of 55,021 reds on that day. Of a total of 340,236 red salmon

counted, 297,618 were tallied at the upper station, 29,100 at the cannery station, 1,351 at Silver Salmon Creek, and 12,167 at Horse Marine Lagoon. In addition, 17,013 pinks, 7,129 cohos, and 31 chums were counted through the racks. All weirs were removed on September 25, when there were showing very few salmon other than cohos, which were reported quite abundant in Olga Bay. The total reported catch of red salmon in commercial fishing was 226,326.

The bureau's work at Alitak was in charge of Henry B. Looff, under the supervision of Warden H. H. Hungerford.

### CHIGNIK RIVER

The site of the Chignik weir was 6 feet below its location the previous season, the river at this point being about 445 feet wide and from 2 to 6 feet deep. Construction was started on April 29; and by May 4 all tripods had been set and the stringers put on, ready for fencing with pickets. At that time, however, ice began coming down the river and continued for two weeks in such quantities that every effort was required to prevent damage to the unfinished weir structure. Work on the weir was resumed on May 19, but on the 22d it was interrupted by a freshet which washed out five tripods and broke some of the stringers. It was not until July 1 that the water had receded sufficiently to permit further work on the weir. On July 10 the river was closed so that no fish could pass, and counting at one of the gates was begun on the following day. When completed, the weir had six 22-inch counting gates and one 76-inch gate to permit the passage of small boats up and down the river.

Prior to June 15 the salmon run at Chignik was light, and from June 16 to July 18 it was fair. The best run of the season occurred from July 19 to August 3, reaching its peak on July 22, when 68,906 red salmon were counted through the weir and 1,342 were caught commercially. The run continued fair throughout August, after which there was a gradual decline to the end of the run on October 7. The total count of red salmon was 605,352. In addition, it was estimated that 107,600 reds passed upstream before the rack was installed, making a total escapement of 712,952 reds. There were also tallied at the weir 27,630 cohos, and 1,343 kings.

The red salmon of the Chignik run were large in size this season, and fewer grilse were observed than in the preceding year. An exceptionally good migration of salmon fingerlings was noted; the first were seen going downstream on May 14, and the migration continued in good numbers to August 15.

Five traps for the capture of salmon were operated in Chignik Bay and Lagoon by the three canneries that have engaged in the industry in this district during previous seasons. The first trap to be operated was brailed on June 8 and the last on September 16. The total catch of red salmon was 637,974. Operations at the Chignik weir were in charge of Warden Charles Petry.

### AYAKULIK OR RED RIVER

The Red River weir was completed on May 24, and on the following day 356 red salmon and 18 kings were tallied. Very few of the latter species were in the river at that time, as most of the run had passed upstream before the weir was installed. The capture of predacious

fishes by seines was undertaken as soon as the weir was completed, and later by a trap installed above the weir, a total of 50,320 Dolly Varden trout being caught during the season. Migrating red salmon were abundant from June 3 to June 18, and a few were observed in the early part of July. The operation of the weir was continued through September 14, when high water made its removal necessary. The total count for the season numbered 618,315 red salmon, 15,510 cohos, 14,166 pinks, and 447 kings.

Operations at Red River were in charge of Henry B. Looff, under the direction of Warden H. H. Hungerford.

### UGANIK RIVER

The work of installing the weir at Uganik River was started on May 31, but was interrupted on June 5 by high water, which did not subside until June 28. When construction work was resumed it was necessary to move the weir 110 feet downstream from the former location, because the freshet had washed out the banks and had left holes in the river bed. The rack was completed on July 3 and was in operation from July 4 through September 4, during which time 6,791 reds, 71,281 pinks, 1,986 cohos, and 2,968 chums were counted. It was estimated that approximately 10,000 red salmon had passed upstream before the weir was installed. H. Olafson was in charge of operations at this weir, under the supervision of Warden H. H. Hungerford.

### KAFLIA BAY

Installation of the weir in the salmon stream tributary to Kaflia Bay was completed on June 11, the work having been hampered considerably because of high water. No salmon were observed in the bay until June 10. Only a few migrating red-salmon fingerlings were noted, as most of them went downstream when the water was high and discolored, making observation difficult. The weir was maintained through August 25, when a total of 11,945 red salmon had been counted. John Gilbert was in charge of the weir under the supervision of Warden H. H. Hungerford.

### ENGLISH BAY

The weir was placed in the stream at the head of English Bay on May 25 and 26, and the first red salmon passed through on June 1. The escapement was exceptionally light up to June 30. From that date to July 22, there was a decided improvement, which brought the total count to 18,878 at the end of the run on July 30, when the weir was removed. Capt. R. L. Cole supervised the work, Jack Tansy carrying on counting operations until the latter part of June and Ralph Sparks thereafter until the end of the season.

### CHINIK CREEK

The Chinik Creek weir was partly installed on June 1 and completed on June 12. Red salmon began to show in the inlet on June 15, and a few were seen near the falls at the mouth of the stream on the following day, but none passed through the weir until July 1. As the commercial catch to that date was approximately 25,000, it was recommended

that additional waters in the vicinity be closed to commercial fishing, and an order was accordingly issued, effective July 6. The last of the run was counted on July 22, when the total escapement for the season numbered 33,514 red salmon. Operations at the weir were carried on by James Hart and supervised by Capt. R. L. Cole.

### KALGIN ISLAND STREAM

Although no weir structure was placed in the stream on Kalgin Island, a count of salmon that ascended on daylight tides was made as in previous years by a watchman stationed near the mouth of the stream. From June 11 to August 10, inclusive, there were counted 9,335 red salmon and 1,470 cohos, and it was estimated that approximately 3,000 reds which could not be tallied escaped during the night tides. Attention was given to keeping the stream mouth free from shifting sands and to exterminating predatory trout, of which 6,596 were captured during the season. The work at this place was performed by Lee Waddell under the direction of Capt. R. L. Cole.

### ORZENOI RIVER

The Orzenoi weir was ready for operation on June 14. Although salmon were showing in the bay as early as June 3, none ascended the stream until June 24, when 17 chums passed through the weir. The first red salmon were counted the following day, and pinks began to ascend on July 19. During the early part of the season a considerable number of predatory trout were removed from the stream. The counting weir was maintained through August 11, when the total escapement of salmon numbered 5,756 reds, 14,470 pinks, 2,092 chums, and 558 cohos. Roy A. Buck carried on the work at this weir, under the supervision of Capt. J. J. O'Donnell.

### MORZHOVOI BAY

The Morzhovoi weir, on the salmon stream emptying into Middle Lagoon was installed the last week of June, and a watchman was placed there on July 1. Salmon began to ascend on July 2, and the run continued through September 7, reaching its peak on August 29, when an escapement of 4,712 was recorded. The total count during the season was 28,590 red salmon. The work at this weir was performed by Harry Hegman, under the direction of Capt. J. J. O'Donnell.

### BEAR RIVER

Following an unsuccessful attempt to install the Bear River weir at the former site, the material was moved downstream about 75 yards, where the river is wider and shallower and the current is less swift. Here the rack was erected without difficulty and was ready for operation on June 24, on which date 14 red salmon were counted. The main run passed upstream between July 11 and July 24, after which the daily escapement was much smaller, although fairly steady, until counting was discontinued at the close of August 21. The total number counted during the season consisted of 210,208 red salmon, 3,145 chums, 112 kings, and 84 pinks. It was estimated that about 15,000 salmon were still in the river below the weir when the structure was removed on August 22. C. R. Sullivan carried on counting operations at this weir under the direction of Capt. J. J. O'Donnell.

### NAKNEK RIVER

Construction of the 1,200-foot weir in Naknek River was begun on June 1, and on June 17 the river was closed so that no fish could pass. The first salmon were counted on June 23, and a fair escapement occurred during the next few days. The main run started on July 2 and continued heavy through July 18, the record count for any one day being 188,715 on July 6. Counting was continued through August 9, when a total of 1,117,629 red salmon had ascended the river. This is nearly double the number counted in 1929, when this weir was first put in operation, and almost four times as many as were counted in 1930. In addition to the red salmon, 896 kings, 49 pinks, 44 cohos, and 77 chums were tallied at the weir this season. The work was in charge of Adrian Youngsman, under the supervision of Agent Dennis Winn.

### UGASHIK RIVER

Work of installing the Ugashik weir was started on June 18 and finished on June 24. Counting began on June 29, when four red salmon passed upstream, but it was not until July 8 that the fish appeared in any appreciable numbers. During the next three weeks a very heavy run occurred, reaching its peak on July 20, when 167,275 red salmon were tallied. After July 26 there was a rapid decline in the run until August 10, when the work of dismantling the weir was begun. The total count for the season consisted of 1,379,623 red salmon, 12 kings, 7 pinks, 8 cohos, and 145 chums. This escapement was by far the largest that has been recorded since the Ugashik weir was first put in operation in 1926. Henry McFadden, under the supervision of Agent Dennis Winn, was in charge of operations at this weir.

## SALMON LIFE-HISTORY STUDIES

The study of the life histories of the Alaska salmon was continued during the year. Dr. Willis H. Rich, of Stanford University, has acted in an advisory capacity in planning this work and has taken an active part in certain of the investigations. In Bristol Bay, Thomas Schulte, under the direction of Doctor Rich, collected data bearing on the runs of adult salmon and on the history of the young salmon in the Wood River system.

The study of the red-salmon runs in the Karluk River was continued by Doctor Rich, assisted by Joseph T. Barnaby. In connection with this study 50,000 young salmon were marked during the course of their seaward migration. The commercial catch was carefully sampled and several hundred adults marked in previous years were recovered. The purpose of these marking experiments is to determine the number of seaward migrants each year as a basis for a more accurate prophecy of later runs. Doctor Rich initiated studies of the life histories and ecology of the red salmon of Afognak Lake and Lake McDonald.

At Chignik a detailed study of the age groups found in the red-salmon runs was again carried on under the direction of Harlan B. Holmes. The study of the young salmon in Chignik lakes and during their seaward migration was also continued. Seton H. Thompson was engaged in a study of the red-salmon runs of the Copper River and made collections of scales and data from the commercial catch and from salmon taken in some of the more important tributaries.

Dr. Frederick A. Davidson continued an important series of investigations dealing particularly with the application of the parent stream theory to pink salmon. During the spring of 1931 he successfully marked a large series of the young pink salmon at Olive Cove, southeastern Alaska, on their seaward migration.

A more detailed account of these investigations will be found in a separate document.[2]

## OBSERVATIONS ON THE ESCAPEMENT OF SALMON

Careful observations of the extent of the salmon runs during the season and examination of the spawning grounds at the close of fishing operations were made by bureau employees in 1931, as heretofore, with a view to securing the required escapement of not less than 50 per cent of the runs. These surveys are the means of determining what modifications in the regulations are necessary to build up the runs in certain localities and to maintain the salmon resources at a high level of productivity. Reports indicate that although a number of salmon streams had an insufficient escapement in 1931, the spawning areas in general were adequately seeded.

*Southeastern Alaska.*—Contrasting strongly with conditions in the previous year, the pink salmon run in the southern district was normal, both as to time of arrival and volume of run. While the fish were not as numerous as in 1930, the size was nearly twice as great and the quality vastly superior. Excellent runs occurred in all portions of the district with the exception of Portland Canal and the Cape Fox shore, where for a long time the odd-year run has been comparatively light. Even in these sections, however, the streams were better seeded than in other similar years. There was a marked increase of red salmon, and chums were much more abundant than last year. The coho run alone decreased sharply. Until late in the season the flow of water in most of the streams was low, but there was little or no loss of fish from this cause, as the rains came in time to save them. An exceedingly heavy run of chums and pinks reached the east shore of Prince of Wales Island toward the close of the fishing season, all streams in this area being seeded to capacity. Karta River had one of the largest runs of chums on record, and reds were also more numerous in this stream than in recent years.

The escapement of pink salmon into the streams along the west shore of Prince of Wales Island was unevenly distributed. Good escapements of pinks and chums were recorded in Calder Bay and El Capitan Passage, but in Tuxecan Passage and Staney Creek the runs of all species were disappointing. The red salmon run at Deweyville, which had been good for the past four years, was a failure in 1931, although the stream contained fair numbers of pinks, chums, and cohos. From Klawak Inlet southward to Cape Chacon pink salmon were much more abundant than in the region from Klawak to Point Baker. Red salmon were more plentiful in Hunter Bay and Klakas and Hetta Inlets than in any other recent year. The run of pink salmon throughout Sumner Strait, Ernest Sound, Bradfield Canal, and Wrangell Narrows showed a marked increase over 1930, and the escapement into the streams was more uniformly distributed than in that year, when some streams were heavily seeded, while others had inadequate escapements.

[2] Progress in Biological Inquiries, 1931. Report of Commissioner of Fisheries for the fiscal year 1932.

In the Icy Strait and western districts the run was equal to that of 1930, good escapements being recorded for all streams, while in the eastern district salmon were more abundant than in any previous year for which records are available. Conditions in the Yakutat district compared favorably with those of the previous year, with good escapements of reds and cohos.

*Prince William Sound and Copper River region.*—The runs of all species of salmon in the Prince William Sound area were distinctly smaller than in 1930, and examinations of the principal spawning grounds indicated that fish were not present in sufficient numbers for adequate seeding, except in a few instances. The escapement of red salmon in Resurrection Bay was considerably better than for the past several years and late cohos were fairly abundant in certain streams, but conditions in general were disappointing. In the Copper River district the escapement of reds was satisfactory, nearly all tributary streams examined showing ample numbers of fish for proper seeding. The run and escapement of king salmon were fair. In the latter part of the season a heavy run of cohos appeared, most of which escaped to spawn, as only one cannery was operated during the fall season.

*Cook Inlet.*—As in the preceding year, the salmon run in this region was irregular, with escapement into the spawning streams decidedly below normal. The red-salmon run, except at Kamishak Bay, was extremely light at first but improved somewhat as the season progressed. A good escapement of this species occurred at Chinik Creek, seeding the spawning grounds adequately, while in English Bay and the Kalgin Island stream the fish were fairly abundant. Virtually all of the streams tributary to Kasilof River and Tustumena Lake were poorly stocked. From Point Gore to and including Kachemak Bay pink salmon were almost as numerous as in 1930, but the run and escapement of this species north of Anchor Point were negligible. Coho salmon, while quite evenly distributed throughout the district, were not as abundant as in 1930, but investigations on the Kasilof and Kenai Rivers and their tributaries indicated fair numbers of this species on the spawning grounds of these important streams, where kings also were found to be more numerous than in the previous year.

*Kodiak-Afognak district.*—The escapement of red salmon was much greater than in either of the two preceding years, most of the streams on both Kodiak and Afognak Islands being well seeded. Good runs of pinks were noted in all sections, covering the spawning beds to capacity. Cohos were fairly abundant, and satisfactory escapements were reported for most of the streams examined. There was a decided shortage of chums, the escapement being estimated at less than one-third of that of 1930. A most encouraging feature of the 1931 season was the excellent showing of reds in the Bushkin and Eagle Rivers, which for the past decade have had negligible escapements of this species.

*Alaska Peninsula.*—Along the north shore of the peninsula good runs of red salmon entered Bear River, Port Moller, Herendeen Bay, and Nelson Lagoon. Izembeck Bay had a good escapement of reds and chums, and in streams along the north side of Unimak Island there were fair runs of these species. Mainland streams from False Pass to Morgan Point had a good escapement of chums but only a small escapement of pinks. From Morgan Point to Arch Point the chum-salmon streams had only light runs, while King Cove and Bel-

kofsky had fair numbers of pinks. A good showing of reds was noted at Long John Lagoon and of chums at Pavlof Bay. Good runs of chums and fair runs of pinks entered the streams from Cape Tolstoi to Kupreanof Point, except at Balboa Bay, where the escapement was very poor, apparently due to volcanic eruptions in that region. Acheredin Bay had a large escapement, but in general the spawning beds of the Shumagin Islands were poorly seeded. A fair escapement of red salmon at Wosnesenski Island was reported, and Sanak Island had good runs of reds and fair numbers of chums and pinks. For the Alaska Peninsula area in general there was a good escapement of reds and chums and a light escapement of pinks and cohos.

*Bristol Bay.*—The escapement of red salmon in the Bristol Bay area as a whole was the most satisfactory in several years. The east side of the bay, especially, had large numbers of fish which were well distributed over the spawning area. The escapement at Nushagak was much better than had been anticipated, although it was estimated as but about 60 per cent of that required for efficient seeding. All other areas of the district were adequately seeded. Reports covering examination of the spawning areas by Agent Dennis Winn and others will be found elsewhere in this publication.

## HATCHERIES

### EXTENT OF OPERATIONS

The propagation of salmon in Alaska was carried on at two Government hatcheries (at Afognak and McDonald Lake) and at one privately owned hatchery—that of the Northwestern Fisheries Co. at Hugh Smith Lake.

*Operations of Federal and private hatcheries in Alaska in 1931*

| Location of hatchery | Red or sockeye salmon | | |
|---|---|---|---|
| | Eggs taken in 1930 | Salmon liberated in 1930–31 | Eggs taken in 1931 |
| Afognak | [1] 6,347,270 | 5,553,080 | [2] 23,054,720 |
| McDonald Lake | 27,469,000 | 22,480,000 | [3] 25,000,000 |
| Hugh Smith Lake (Quadra) | 21,190,000 | 20,266,000 | 20,280,000 |
| Total | 55,006,270 | 48,299,080 | 68,334,720 |

[1] Figures corrected from those given in 1930 report.
[2] Also 32,826 steelhead trout eggs and 2,731,424 Dolly Varden trout eggs were collected, the latter for shipment to the States.
[3] Also 353,000 pink-salmon eggs were collected. Shipped 3,144,960 eyed red-salmon eggs to Seattle in October for the Oregon Fish Commission.

### AFOGNAK

The Federal salmon hatchery at Afognak produced and liberated in Litnik Lake and smaller lakes near by 5,553,080 No. 1 red-salmon fingerlings from the 6,347,270 eggs of that species collected in the summer of 1930. The net loss on the take, therefore, was approximately 13 per cent. Of the 13,671,670 pink-salmon eggs collected in August and September, 1930, 10,155,776 were shipped in the eyed stage to the Department of Fisheries and Game of the State of Washington; from the remainder there were produced 1,145,334 No. 1 fingerlings, which were released in Litnik River in April and June, 1931.

In May there were taken near the outlet of Lake Litnik 32,826 steelhead trout eggs, which were planted in Eagle Creek in June.

The collection of red-salmon eggs began on July 29 and ended on October 3, 1931, with a total take of 23,054,720. From October 18 to November 7, inclusive, 2,731,424 Dolly Varden trout eggs were collected for shipment to the States.

### M'DONALD LAKE

Of the 27,469,000 red-salmon eggs collected at the Federal salmon hatchery on McDonald Lake in 1930, 3,055,000 in the eyed stage were shipped to Seattle in the fall for distribution in the States of Washington and Oregon. From the remaining eggs there were produced and liberated in Lake McDonald 22,480,000 No. 2 fingerlings, making a net loss on the take of about 7 per cent.

There were also planted in Lake McDonald advanced fry consisting of 85,000 chum-salmon fry, hatched from the 100,000 eggs of that species collected in the preceding year, and 261,000 pink-salmon fry, the brood of the eggs remaining at the hatchery from the take of 7,055,000 after 6,107,000 in the eyed stage had been shipped to Seattle in the fall of 1930.

On March 3, 1931, a shipment of 128,000 eastern brook trout eggs was received at the hatchery for incubation. The resulting fry numbered 116,000, but there was a considerable loss while they were being reared. In September and October 77,050 No. 3 fingerlings were planted in various lakes in the vicinity of Juneau, Ketchikan, Wrangell, Petersburg, and Red Bluff.

In 1931, 25,000,000 red-salmon eggs were collected at this station from August 29 to September 17, and 353,000 pink-salmon eggs from August 29 to September 5. A shipment of 3,144,960 eyed red-salmon eggs was forwarded to Seattle in October for delivery to the Oregon Fish Commission.

### HUGH SMITH LAKE (QUADRA)

The Northwestern Fisheries Co. liberated 20,266,000 red-salmon fry from its hatchery near Bôca de Quadra in 1931, hatched from 21,190,000 eggs taken in 1930, a loss of 4 per cent. In 1931 the take of eggs began on August 6 and was continued until September 7, during which time 20,280,000 red-salmon eggs were collected.

### HATCHERY REBATES

The owners of private salmon hatcheries in Alaska who are also packers of canned salmon receive a rebate on license fees and taxes of every nature on their catch and pack of salmon at the rate of 40 cents per 1,000 king or red salmon fry liberated by them in Alaskan waters. In the fiscal year ended June 30, 1931, only one such private salmon hatchery was operated—that of the Northwestern Fisheries Co. at Hugh Smith Lake—and the rebate due on the 20,266,000 red-salmon fry liberated there during the year amounted to $8,106.

## GENERAL STATISTICS OF THE FISHERIES

The total number of persons engaged in the fisheries of Alaska in 1931 was 22,577, or 4,991 less than in 1930. Fishery products were valued at $33,594,752—a decrease of $4,084,297, or about 11 per cent, from the preceding year. Of the total amount, 90.6 per cent represented the value of salmon products; 4 per cent, halibut; 3.6 per cent, herring; and 1.8 per cent, the value of all other fishery products.

*Summary of persons engaged and products of the Alaska fisheries in 1931*

| Items | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Number | Value | Number | Value | Number | Value | Number | Value |
| **PERSONS ENGAGED** | | | | | | | | |
| Whites | 4,857 | | 3,488 | | 4,015 | | 12,360 | |
| Natives | 2,828 | | 940 | | 1,070 | | 4,838 | |
| Chinese | 156 | | 209 | | 305 | | 670 | |
| Japanese | 361 | | 345 | | 291 | | 997 | |
| Filipinos | 1,133 | | 855 | | 754 | | 2,742 | |
| Mexicans | 20 | | 93 | | 772 | | 885 | |
| Kanakas | 2 | | 12 | | 7 | | 21 | |
| Puerto Ricans | | | 7 | | 6 | | 13 | |
| Negroes | | | 2 | | 30 | | 32 | |
| Koreans | 16 | | 2 | | 1 | | 19 | |
| Total | 9,373 | | 5,953 | | 7,251 | | 22,577 | |
| **PRODUCTS** | | | | | | | | |
| Salmon: | | | | | | | | |
| Canned ... cases | 2,538,936 | $10,167,122 | 1,681,554 | $8,652,949 | 1,183,249 | $10,276,221 | 5,403,739 | $29,096,292 |
| Mild cured ... pounds | 3,243,200 | 626,291 | 16,800 | 1,425 | 60,800 | 6,037 | 3,320,800 | 633,753 |
| Pickled ... do | 77,800 | 6,121 | 354,450 | 31,161 | 708,950 | 66,226 | 1,141,200 | 103,508 |
| Fresh ... do | 768,619 | 55,918 | | | | | 768,619 | 55,918 |
| Frozen ... do | 6,160,117 | 411,171 | 22,800 | 644 | | | 6,182,917 | 411,815 |
| Dry-salted, dried, and smoked ... do | 7,600 | 380 | 9,450 | 945 | 1,265,126 | 76,935 | 1,282,176 | 78,260 |
| Smoked and packed in olive oil ... cases | 111 | 999 | | | | | 111 | 999 |
| Pudding ... do | | | 148 | 950 | | | 148 | 950 |
| Eggs for caviar ... pounds | | | | | 4,100 | 500 | 4,100 | 500 |
| Fertilizer ... do | 1,020,000 | 20,040 | 565,288 | 9,054 | | | 1,585,288 | 29,094 |
| Oil ... gallons | 29,000 | 3,770 | 25,980 | 8,542 | | | 54,980 | 12,312 |
| Halibut: | | | | | | | | |
| Fresh ... pounds | 13,681,622 | 942,135 | 117,070 | 8,948 | 12,588 | 496 | 13,811,280 | 951,579 |
| Frozen ... do | 5,337,364 | 335,725 | 1,157,737 | 57,019 | 116,812 | 8,177 | 6,611,913 | 400,921 |
| Cheeks, frozen ... do | | | 2,032 | 102 | | | 2,032 | 102 |
| Pudding ... cases | | | 17 | 85 | | | 17 | 85 |
| Herring: | | | | | | | | |
| Fresh, for bait ... pounds | 1,910,100 | 26,763 | 946,762 | 12,469 | 29,250 | 351 | 2,886,112 | 39,583 |
| Frozen, for bait ... do | 4,675,060 | 36,566 | 46,625 | 746 | | | 4,721,685 | 37,312 |
| Frozen, for food ... do | | | | | 236,500 | 9,460 | 236,500 | 9,460 |
| Pickled, for food: | | | | | | | | |
| Scotch cure ... do | 1,759,475 | 107,097 | 2,960,350 | 167,217 | 3,291,225 | 199,493 | 8,011,050 | 473,807 |
| Norwegian cure ... do | 200 | 15 | 29,500 | 2,006 | 130,800 | 8,790 | 160,500 | 10,811 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Roused, for food (bloater stock) | do | | | | | 92,400 | 4,266 | 92,400 | 4,266 |
| Spiced | do | 2,000 | 250 | | | | | 2,000 | 250 |
| Dry-salted | do | | | | | 73,050 | 3,000 | 73,050 | 3,000 |
| Meal | do | 14,000,276 | 242,736 | 1,822,700 | 30,089 | | | 15,822,976 | 272,825 |
| Oil | gallons | 1,910,242 | 334,246 | 242,464 | 42,336 | | | 2,152,706 | 376,582 |
| Cod: | | | | | | | | | |
| Dry-salted | pounds | | | 58,800 | 2,702 | 90,000 | 4,500 | 148,800 | 7,202 |
| Stockfish | do | | | 119,300 | 11,930 | | | 119,300 | 11,930 |
| Pickled | do | | | 146,398 | 4,471 | | | 146,398 | 4,471 |
| Tongues | do | | | 400 | 47 | | | 400 | 47 |
| Clams: | | | | | | | | | |
| Canned | cases | 1,486 | 8,906 | 40,793 | 303,468 | | | 42,279 | 312,374 |
| Juice | do | 13 | 33 | | | | | 13 | 33 |
| Whole in shell | dozen | | | 100 | 50 | | | 100 | 50 |
| Crabs: | | | | | | | | | |
| Canned | cases | | | 263 | 2,104 | | | 263 | 2,104 |
| Meat | pounds | 56,271 | 21,600 | 43,686 | 17,478 | | | 99,957 | 39,078 |
| Whole in shell | dozen | 202 | 404 | 320 | 480 | | | 522 | 884 |
| Shrimp: | | | | | | | | | |
| Meat | pounds | 457,005 | 183,950 | 400 | 100 | | | 457,405 | 184,050 |
| Whole in shell | do | 1,645 | 247 | 1,000 | 150 | | | 2,645 | 397 |
| Trout: | | | | | | | | | |
| Canned | cases | 72 | 576 | | | | | 72 | 576 |
| Fresh | pounds | 34,552 | 3,011 | 21,400 | 2,422 | | | 55,952 | 5,433 |
| Frozen | do | 21,786 | 738 | 5,936 | 419 | | | 27,722 | 1,157 |
| Pickled | do | 400 | 36 | | | | | 400 | 36 |
| Sablefish: | | | | | | | | | |
| Fresh | do | 1,110 | 30 | | | | | 1,110 | 30 |
| Frozen | do | 278,235 | 13,256 | | | | | 278,235 | 13,256 |
| Smelt: Fresh | do | | | 1,340 | 80 | | | 1,340 | 80 |
| Rockfishes: | | | | | | | | | |
| Fresh | do | 4,451 | 134 | | | | | 4,451 | 134 |
| Frozen | do | 18,468 | 543 | | | | | 18,468 | 543 |
| "Lingcod," frozen | do | 526 | 16 | | | | | 526 | 16 |
| Flounders: | | | | | | | | | |
| Fresh | do | 210,000 | 5,250 | | | | | 210,000 | 5,250 |
| Frozen | do | 65,172 | 1,637 | | | | | 65,172 | 1,637 |
| Total | | | 13,557,712 | | 9,372,588 | | 10,664,452 | | [1] 33,594,752 |

[1] These figures represent the value of the manufactured product. It is estimated that the value of the catch to the fishermen was approximately $10,043,000. The round weight of the salmon catch landed by the fishermen was approximately 467,664,391 pounds, and the corresponding figures for herring were approximately 103,566,888 pounds. The cod figures given above do not include the offshore catch from waters adjacent to Alaska, which amounted to 3,352,011 pounds of dry-salted cod, having a total value of $220,129, landed at ports of the Pacific Coast States.

## SALMON

Notwithstanding a considerable reduction in the amount of fishing gear used in the southeast and central districts, in accordance with the purpose of cannery men to curtail operations because of the unsatisfactory market, the yield of salmon in Alaska was on about the usual level. Of the five species of salmon, only one—the red salmon—showed an increased catch for 1931, as compared with the preceding year. This was due primarily to the abundance of fish in the Bristol Bay area, particularly on the east side of the bay. The runs of reds along the Alaska Peninsula and in the Chignik and Karluk Rivers also showed a marked improvement, while in southeastern Alaska there was a decline in the catch of this species. Although there was a marked decrease in the number of pink salmon taken, its effect was largely offset by the greater size of the individual fish, which averaged about one-third larger than in 1930.

The total catch of salmon decreased approximately 11 per cent from that of 1930. By districts, southeastern Alaska showed a decrease of 35 per cent and central Alaska 7 per cent, while the western district gained approximately 161 per cent.

There was a decrease of 30 per cent in the number of fathoms of seines and 5 per cent in the number of fathoms of gill nets used in Alaska in 1931, as compared with the previous year, while traps decreased 32 per cent.

### CATCH AND APPARATUS

The total number of seines used in the salmon industry in 1931 was 556, of which number 417 were purse seines and 139 beach seines. The purse seines aggregated 65,123 fathoms of webbing, and the beach seines 15,939 fathoms. The number of gill nets used was 4,504, having a total length of 261,625 fathoms. There were 219 driven and 259 floating traps—a total of 478.

Southeastern Alaska was accredited with 292 seines, or a total of 51,808 fathoms of webbing, a decrease of 129 seines and 21,531 fathoms of webbing from the number used in 1930; also with 315 gill nets, aggregating 18,260 fathoms, a decrease of 46 nets and 3,105 fathoms of webbing; and with 40 driven and 234 floating traps, a decrease of 23 driven and 147 floating traps from the number operated in 1930.

Corresponding figures for central Alaska show 257 seines, or 28,149 fathoms, as compared with 354 seines, or 39,168 fathoms in 1930; 1,826 gill nets, or 82,523 fathoms, as compared with 2,555 gill nets, or 119,990 fathoms in 1930; and 177 driven and 25 floating traps, as compared with 213 driven and 42 floating traps in 1930.

In western Alaska 7 seines, or 1,105 fathoms of webbing, were used, a decrease from 1930 of 14 seines and 2,785 fathoms of webbing. There were 2,363 gill nets used, or an aggregate of 160,842 fathoms, an increase of 179 nets and 27,582 fathoms of webbing. As in 1930, two driven traps were operated in this district.

Seines caught 20 per cent of the salmon taken in 1931; gill nets, 25 per cent; and traps, 53 per cent; while lines and wheels took the remaining 2 per cent.

*Percentage of salmon caught in each Alaska district, by principal forms of apparatus*

| Apparatus | Southeast Alaska | | Central Alaska | | Western Alaska | |
|---|---|---|---|---|---|---|
| | 1930 | 1931 | 1930 | 1931 | 1930 | 1931 |
| Seines | 27 | 22 | 30 | 28 | 5 | 5 |
| Gill nets | 2 | 2 | 10 | 9 | 87 | 92 |
| Traps | 69 | 73 | 60 | 63 | 1 | |
| Lines | 2 | 3 | | | | |
| Wheels | | | | | 7 | 3 |

The total catch of salmon in 1931 was 73,848,682, a decrease of 8,892,950, or about 11 per cent, from the number taken in 1930. There was a decrease of 17,858,031 in southeastern Alaska and 1,672,833 in central Alaska, while the western district gained 10,637,914. The catch by species shows that cohos decreased 1,894,278, chums 28,464, pinks 19,002,286, and kings 212,608, while reds increased 12,244,686.

*Salmon taken in 1931, by apparatus and species, in each geographic section of Alaska*

| Apparatus and species | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Seines: | | | | |
| Coho, or silver | 131,845 | 78,501 | | 210,346 |
| Chum, or keta | 1,131,713 | 912,797 | 42,925 | 2,087,435 |
| Pink, or humpback | 5,785,656 | 4,829,858 | | 10,615,514 |
| King, or spring | 780 | 386 | 1,556 | 2,722 |
| Red, or sockeye | 496,929 | 653,759 | 742,198 | 1,892,886 |
| Total | 7,546,923 | 6,475,301 | 786,679 | 14,808,903 |
| Gill nets: | | | | |
| Coho, or silver | 188,298 | 274,385 | 1,219 | 463,902 |
| Chum, or keta | 7,892 | 30,759 | 1,064,380 | 1,103,031 |
| Pink, or humpback | 159,763 | 277,523 | 5 | 437,291 |
| King, or spring | 27,550 | 51,769 | 83,347 | 162,666 |
| Red, or sockeye | 379,500 | 1,324,566 | 14,790,373 | 16,494,439 |
| Total | 763,003 | 1,959,002 | 15,939,324 | 18,661,329 |
| Traps: | | | | |
| Coho, or silver | 386,703 | 517,961 | | 904,664 |
| Chum, or keta | 1,711,141 | 1,256,314 | 8,171 | 2,975,626 |
| Pink, or humpback | 21,298,111 | 9,050,799 | | 30,348,910 |
| King, or spring | 8,605 | 55,511 | 964 | 65,080 |
| Red, or sockeye | 946,656 | 3,752,560 | 63,670 | 4,762,886 |
| Total | 24,351,216 | 14,633,145 | 72,805 | 39,057,166 |
| Lines: | | | | |
| Coho, or silver | 445,253 | | | 445,253 |
| King, or spring | 423,260 | | | 423,260 |
| Total | 868,513 | | | 868,513 |
| Wheels: | | | | |
| Chum, or keta | | | 426,228 | 426,228 |
| King, or spring | | | 26,543 | 26,543 |
| Total | | | 452,771 | 452,771 |
| Total: | | | | |
| Coho, or silver | 1,152,699 | 870,847 | 1,219 | 2,024,165 |
| Chum, or keta | 2,850,746 | 2,199,870 | 1,541,704 | 6,592,320 |
| Pink, or humpback | 27,243,530 | 14,158,180 | 5 | 41,401,715 |
| King, or spring | 460,195 | 107,666 | 112,410 | 680,271 |
| Red, or sockeye | 1,823,085 | 5,730,885 | 15,596,241 | 23,150,211 |
| Grand total | 33,529,655 | 23,067,448 | 17,251,579 | 73,848,682 |

## CANNING

### CHANGES IN CANNERIES

Few changes were made in the ownership and operation of Alaska salmon canneries in 1931 as compared with such transactions in other recent years. There was, however, considerable consolidation of effort in the interest of economy, and several of the canneries that remained closed during the season had their catches of fish packed at other plants.

New organizations were formed by independent trap owners of Ketchikan under the names of the United Salmon Packers (Inc.) and the Ketchikan Packing Co. to lease and operate the Skowl Arm plant of the Straits Packing Co. and the Sunrise cannery of the Stuart Corporation, respectively. In connection with the latter there was an option to purchase, and ownership of the plant was transferred toward the close of the year. The floating plant *Pioneer*, which the Stuart Corporation sold to the Far North Fisheries (Inc.) in 1927, was repossessed by the former company in 1929. The vessel had been moved to Hydaburg, where it was raised on the beach and operated as a shore cannery for several years, but in 1931 it was refloated and moored to a dock at Ketchikan.

The floating cannery *International*, belonging to the International Packing Co., was operated at Sand Point under contract by a new concern, Unga Fisheries Co., a subsidiary of the Alaska Pacific Salmon Corporation. A pack of canned salmon was put up by the Associated Fishermen of Alaska in the Bristol Bay region aboard the *Santa Flavia*, which had formerly been operated under the name of the Alaska Fishermen's Cooperative Packing Co. Each of these floating canneries had been used in both central and western Alaska in 1930, but in 1931 their activities were confined to one district—the *International* operating in central Alaska, and the *Santa Flavia* in the western district.

Two plants in the Bristol Bay area that had been idle in 1930—the (X) plant of the Alaska Packers Association at Kvichak Bay and the Libbyville plant of Libby, McNeill & Libby—were reopened and operated by their respective owners.

### NEW CANNERIES

Only one new cannery, that of Albert and Josie Sandvik at Uganik, is included in the list of plants operated. This is a hand cannery which began operations in 1929, but was not listed as a cannery in that and the following year, as it had only a small output.

### CANNERIES NOT OPERATED

Thirty-six canneries that had been operated in the previous year were closed in 1931. Of this number, 17 were in southeast Alaska, 16 in central, and 3 in western Alaska. The floating plant operated at Port Heiden by the Anvil Sea Food Corporation in 1930 was used in Puget Sound waters in 1931. The steamer *Mazama*, of the Everett Packing Co., was not operated as a floating cannery in 1931 but was used as a supply ship for the Herendeen Bay Consolidated Canneries. There have been dropped from the list of inactive canneries the Heceta Island plant of the Nakat Packing Corporation, which has

been dismantled, and the Kvichak Bay plant of the Alaska Salmon Co., which has been used as a saltery in recent years.

The following canneries were closed during the year, but may be reopened:

| | |
|---|---|
| Southeastern Alaska: | |
| Alaska Pacific Fisheries | Burnett Inlet. |
| Alaska Pacific Salmon Corporation | Boca de Quadra. |
| | Chomly. |
| | Funter Bay. |
| | Pybus Bay. |
| | Tenakee. |
| Alaska Packers Association | Loring. |
| | Wrangell. |
| Alaska Sanitary Packing Co | Cape Fanshaw. |
| Columbia River Packers Association | Lake Bay. |
| Douglas Island Packing Co | Douglas. |
| Hetta Packing Co | Coppermount. |
| Hoonah Packing Co | Hoonah. |
| | Gambier Bay. |
| Libby, McNeill & Libby | Karheen. |
| | Klawak. |
| The Nakat Packing Corporation | Ketchikan. |
| New England Fish Co | Do. |
| Northwestern Fisheries Co | Hunter Bay. |
| | Kasaan. |
| | Santa Ana. |
| | Shakan. |
| Pacific American Fisheries | Ketchikan. |
| | Port Walter. |
| The Stuart Corporation (floating plant) | Ketchikan. |
| Wrangell Narrows Packing Co | Scow Bay. |
| Central Alaska: | |
| Alaska Pacific Salmon Corporation | Drier Bay. |
| Alaska Packers Association | Kasilof. |
| Blue Island Packing Co | Blue Fox Bay. |
| W. G. Culver | Point McManus. |
| Kadiak Fisheries Co | Shearwater Bay. |
| Katmai Packing Co | Uzinki. |
| Kenai River Packing Co | Kenai. |
| Kustatan Packing Co | Kustatan. |
| New England Fish Co | Drier Bay. |
| North Pacific Fisheries (Inc.) (floating plant) | Uyak Bay. |
| Pacific American Fisheries | Bering River. |
| | Ikatan. |
| | Unakwik Inlet. |
| Charles W. Pajoman | Iron Creek. |
| Port Williams Packing Corporation | Port Williams. |
| Redoubt Bay Packing Co | Redoubt Bay. |
| Shepard Point Packing Co | Port Ashton. |
| Harvey J. Smith | West Foreland. |
| Sunset Packing Co | Otter Creek. |
| J. F. Toman Packing Co | Anchorage. |
| John Wik | Kenai. |
| Jake Young | Port Chatham. |
| Western Alaska: | |
| Alaska Packers Association | Naknek River. |
| | Nushagak Bay. |
| Red Salmon Canning Co | Naknek River. |
| | Ugashik River. |

TOTAL CANNERIES OPERATED

There were 116 canneries operated in Alaska in 1931—40 in southeastern, 51 in central, and 25 in western—which is 17 less in southeastern, 15 less in central, and 1 less in the western district than in 1930, a net decrease of 33 plants.

*Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1931*

[New canneries indicated by (*)]

| Company | Canneries | | Traps | | |
|---|---|---|---|---|---|
| | Number | Location | Driven | Floating | Total |
| Southeast Alaska: | | | | | |
| Alaska Pacific Salmon Corporation | 4 | Funter Bay [1] | | 15 | 15 |
| | | Kake | | 10 | 10 |
| | | Ketchikan | 4 | 4 | 8 |
| | | Port Althorp | | 11 | 11 |
| | | Rose Inlet | | 6 | 6 |
| Annette Island Packing Co | 1 | Metlakatla | 5 | 1 | 6 |
| Astoria & Puget Sound Canning Co | 1 | Excursion Inlet | 1 | 7 | 8 |
| Bayview Packing Co | 1 | Klawak | | | |
| Beegle Packing Co | 1 | Ketchikan | | 4 | 4 |
| Demmert Packing Co | 1 | Klawak | | | |
| Diamond K Packing Co | 1 | Wrangell (floating) | | 3 | 3 |
| Fidalgo Island Packing Co | 2 | Bay of Pillars | 5 | | 5 |
| | | Ketchikan | 3 | 2 | 5 |
| Haines Packing Co | 1 | Letnikof Cove | | | |
| P. E. Harris & Co | 1 | Hawk Inlet | | 7 | 7 |
| Hood Bay Canning Co | 1 | Hood Bay | | 3 | 3 |
| Icy Straits Fisheries (Inc.) | 1 | Hoonah (floating) | | | |
| Independent Salmon Canneries (Inc.) | 1 | Ketchikan | | | |
| Iwersen Packing Co | 1 | do | | | |
| Ketchikan Packing Co | 1 | do | | | |
| Libby, McNeill & Libby | 4 | Craig | | 15 | 15 |
| | | George Inlet | | 5 | 5 |
| | | Taku Harbor | 6 | 8 | 14 |
| | | Yakutat | | | |
| Nakat Packing Corporation, The | 3 | Hidden Inlet | | 6 | 6 |
| | | Union Bay | | 8 | 8 |
| | | Waterfall | | 9 | 9 |
| New England Fish Co | 3 | Chatham | 2 | 3 | 5 |
| | | Ketchikan [1] | | 2 | 2 |
| | | Noyes Island | | 6 | 6 |
| | | Yakutat (floating) | | | |
| Northwestern Fisheries Co | 2 | Boca de Quadra | 5 | 8 | 13 |
| | | Dundas Bay | | 3 | 3 |
| Pacific American Fisheries | 1 | Excursion Inlet | 3 | 2 | 5 |
| | | Ketchikan [1] | 2 | 2 | 4 |
| Peril Straits Packing Co | 1 | Todd | | 5 | 5 |
| Petersburg Packing Co | 1 | Petersburg | 3 | 7 | 10 |
| Pyramid Packing Co. (Inc.) | 1 | Sitka | | 3 | 3 |
| Sebastian-Stuart Fish Co | 1 | Tyee | | 6 | 6 |
| Superior Packing Co | 1 | Tenakee | | 4 | 4 |
| United Salmon Packers (Inc.) | 1 | Skowl Arm | | | |
| Ward's Cove Packing Co | 1 | Ward Cove | | 3 | 3 |
| Wrangell Packing Corporation | 1 | Wrangell | | | |
| Central Alaska: | | | | | |
| Alaska Packers Association | 3 | Alitak | 4 | | 4 |
| | | Chignik | 2 | | 2 |
| | | Karluk | 4 | | 4 |
| Alaska Year-Round Canneries Co | 1 | Seldovia | 5 | | 5 |
| Alitak Fish Co | 2 | Alitak | 4 | | 4 |
| | | Zachar Bay | 2 | | 2 |
| Anderson Mercantile Co. (Inc.) | 1 | Deep Creek | 1 | | 1 |
| Columbia River Packers Association | 1 | Chignik | 4 | | 4 |
| Cook Inlet Packing Co | 1 | Seldovia | 6 | | 6 |
| Copper River Packing Co | 1 | McClure Bay | | 8 | 8 |
| Cordova Packing Co | 1 | Cordova | | | |
| H. J. Emard | 1 | Anchorage | 4 | | 4 |
| Farwest Fisheries (Inc.) | 1 | do | 5 | | 5 |
| Fidalgo Island Packing Co | 1 | Port Graham | 8 | | 8 |
| Glacier Packing Co | 1 | Cordova (floating) | | | |
| Grimes Packing Co | 1 | Uzinki | | | |
| Gustan & Vogel | 1 | Point Possession | 2 | | 2 |
| P. E. Harris & Co | 1 | False Pass | 8 | | 8 |
| Kadiak Fisheries Co | 1 | Kodiak | 4 | | 4 |
| Libby, McNeill & Libby | 1 | Kenai | 18 | | 18 |
| New England Fish Co | 1 | Cordova | 4 | 1 | 5 |
| A. N. Nilson | 1 | Portlock | | | |
| Ninilchik Packing Co | 1 | Ninilchik | 1 | | 1 |
| North Coast Packing Co | 1 | do | 4 | | 4 |
| Northern Light Packing Co | 1 | Mountain Slough | | | |
| Northwestern Fisheries Co | 4 | Chignik | 2 | | 2 |
| | | Kenai | 10 | | 10 |
| | | Orca | | 6 | 6 |
| | | Uyak | | | |

[1] Traps only were operated, the fish being packed at other canneries.

*Companies that canned salmon in Alaska, number and location of canneries operated, and number of traps owned by each, 1931*—Continued

[New canneries indicated by (*)]

| Company | Canneries | | Traps | | |
|---|---|---|---|---|---|
| | Number | Location | Driven | Floating | Total |
| Central Alaska—Continued. | | | | | |
| Pacific American Fisheries | 2 | King Cove | 16 | | 16 |
| | | Valdez | 4 | | 4 |
| Pioneer Packing Co | 1 | Cordova | 2 | 1 | 3 |
| Pioneer Sea Foods Co | 1 | Eyak River | | | |
| Point Possession Fish Co | 1 | Point Possession | [1]1 | | 1 |
| Premier Salmon Co | 1 | Orca Bay | 2 | 1 | 3 |
| Albert & Josie Sandvik | 1 | Uganik Village * | | | |
| E. Sandvik | 1 | Swansons Creek | | | |
| San Juan Fishing & Packing Co | 3 | Evans Bay | 2 | 2 | 4 |
| | | Tutka Bay | 3 | | 3 |
| | | Uganik Bay | 3 | | 3 |
| Seashore Packing Co | 1 | Kukak Bay | | | |
| Seward Fisheries (Inc.) | 1 | Seward | | | |
| Shelikof Packing Co | 1 | Zachar Bay | | | |
| Shepard Point Packing Co | 1 | Shepard Point | | 5 | 5 |
| Shumagin Packing Co | 1 | Squaw Harbor | 2 | | 2 |
| Snug Harbor Packing Co | 1 | Snug Harbor | 8 | | 8 |
| Spur Fish Corporation | 1 | Nikishka Bay | | | |
| Toman Packing Co | | Anchorage [1] | 1 | | 1 |
| Trinity Packing Co | 1 | Three Saints Bay | | | |
| Uganik Fisheries (Inc.) | 1 | Uganik | 3 | | 3 |
| Unga Fisheries Co | 1 | Sand Point (floating) | 1 | | 1 |
| West Coast Canning Co | 1 | Tuxedna Bay | | | |
| Western Alaska: | | | | | |
| Alaska Packers Association | 7 | Egegik River | | | |
| | | Kvichak Bay (2) | | | |
| | | Naknek River (2) | | | |
| | | Nushagak Bay | | | |
| | | Ugashik River | | | |
| Alaska-Portland Packers Association | 2 | Naknek River | | | |
| | | Nushagak Bay | | | |
| Alaska Salmon Co | 1 | Wood River | | | |
| Associated Fishermen of Alaska (Inc.) | 1 | Nushagak Bay and Naknek River (floating). | | | |
| Bristol Bay Packing Co | 1 | Kvichak Bay | | | |
| Columbia River Packers Association | 1 | Nushagak Bay | | | |
| Herendeen Bay Consolidated Canneries | 1 | Herendeen Bay | | | |
| Libby, McNeill & Libby | 6 | Egegik River | | | |
| | | Ekuk | | | |
| | | Kogglung | | | |
| | | Libbyville | | | |
| | | Lockanok | | | |
| | | Nushagak | | | |
| Nakat Packing Corporation, The | 1 | Nakeen | | | |
| Northwestern Fisheries Co | 2 | Naknek River | | | |
| | | Nushagak | | | |
| Pacific American Fisheries | 1 | Port Moller | 2 | | 2 |
| Red Salmon Canning Co | 1 | Naknek River | | | |

[1] Traps only were operated, the fish being packed at other canneries.

LOSSES AND DISASTERS

Reported property losses in the salmon industry in Alaska in 1931 totaled $101,346. In southeastern Alaska an Oriental bunk house was burned and miscellaneous fishing equipment and small boats were lost, the total value of which amounted to $18,564. The plant of the Trinity Packing Co. at Three Saints Bay, together with the cannery dock and part of the season's pack of canned salmon, was destroyed by fire. The loss was $21,600. Other losses in the central district included the cannery tender *Edna G*, a number of small boats, and fishing gear, having a total value of $26,084. In the western district losses aggregated $35,098, consisting of nets, small boats,

cannery supplies, a bunk house, and the tender *Oregonian*, which sank with a load of some 10,000 red salmon.

Twenty-one lives were lost—5 in southeastern Alaska, 5 in central, and 11 in the western district. In southeastern Alaska 2 fishermen were drowned, 2 shoresmen were accidentally killed, and 1 shoresman died of disease. One fisherman, 1 transporter, and 2 shoresmen died of disease and 1 fisherman was drowned in the central district. In western Alaska 3 shoresmen and 5 fishermen died of disease, and 2 shoresmen and 1 fisherman met accidental death.

### STATISTICS

In 1931, 116 canneries were operated in Alaska, 33 less than in 1930. Employment was given to 18,158 persons, as compared with 22,324 in 1930, a decrease of 4,166. White employees decreased 2,099; natives, 273; Chinese, 100; Japanese, 265; Filipinos, 1,493; Kanakas, 10; Puerto Ricans, 8; Negroes, 58; and miscellaneous (Koreans, etc.), 10; while Mexicans increased 150.

The total pack of canned salmon was 5,403,739 cases, valued at $29,096,292. This was an increase of 371,413 cases, or a little more than 7 per cent, over the pack of 1930 and a decrease in value of $598,606, or about 2 per cent. The output in southeastern Alaska decreased from 2,977,286 to 2,538,936 cases, or nearly 15 per cent, while there was an increase in central Alaska from 1,618,545 to 1,681,554 cases, or about 4 per cent, and in western Alaska from 436,495 to 1,183,249 cases, or 171 per cent. In Alaska as a whole the pack of reds increased from 851,514 to 1,694,278 cases, or 99 per cent, while cohos decreased from 332,422 to 169,878 cases, or 49 per cent; chums from 599,934 to 533,856 cases, or 11 per cent; pinks from 3,188,534 to 2,953,860 cases, or 7 per cent; and kings from 59,922 to 51,867 cases, or 13 per cent.

Data are included in the following tables to show comparison of the 1931 pack with the average for the five preceding years, 1926 to 1930, by cases of each species and by districts. Two species—pinks and reds—show a gain over the 5-year average, while cohos, chums, and kings show a decline. By districts the pack in central Alaska decreased 7 per cent, while in southeastern and western Alaska there were increases of approximately 4 and 8 per cent, respectively, making a net gain for all of Alaska of 1 per cent over the 5-year average.

*Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1931*

| Items | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 820 | 1,079 | 1,744 | 3,643 |
| Natives | 1,104 | 430 | 252 | 1,786 |
| Japanese | 2 | | | 2 |
| Filipinos | 11 | | | 11 |
| Mexicans | 3 | | | 3 |
| Kanakas | 2 | | | 2 |
| Total | 1,942 | 1,509 | 1,996 | 5,447 |

*Persons engaged, wages paid, and operating units of Alaska salmon canning industry, 1931*—Continued

| Items | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED—continued | | | | |
| Shoresmen: | | | | |
| Whites | 1,245 | 1,208 | 1,603 | 4,056 |
| Natives | 1,215 | 444 | 82 | 1,741 |
| Chinese | 152 | 209 | 301 | 662 |
| Japanese | 336 | 335 | 290 | 961 |
| Filipinos | 1,110 | 842 | 752 | 2,704 |
| Mexicans | 10 | 92 | 772 | 874 |
| Kanakas | | 12 | 7 | 19 |
| Puerto Ricans | | 7 | 6 | 13 |
| Negroes | | 2 | 30 | 32 |
| Koreans | 16 | 2 | 1 | 19 |
| Total | 4,084 | 3,153 | 3,844 | 11,081 |
| Transporters: | | | | |
| Whites | 539 | 538 | 474 | 1,551 |
| Natives | 30 | 35 | | 65 |
| Chinese | 3 | | 4 | 7 |
| Japanese | 2 | 3 | | 5 |
| Filipinos | | | 2 | 2 |
| Total | 574 | 576 | 480 | 1,630 |
| Total: | | | | |
| Whites | 2,604 | 2,825 | 3,821 | 9,250 |
| Natives | 2,349 | 909 | 334 | 3,592 |
| Chinese | 155 | 209 | 305 | 669 |
| Japanese | 340 | 338 | 290 | 968 |
| Filipinos | 1,121 | 842 | 754 | 2,717 |
| Mexicans | 13 | 92 | 772 | 877 |
| Kanakas | 2 | 12 | 7 | 21 |
| Puerto Ricans | | 7 | 6 | 13 |
| Negroes | | 2 | 30 | 32 |
| Koreans | 16 | 2 | 1 | 19 |
| Grand total | 6,600 | 5,238 | 6,320 | 18,158 |
| Wages paid shoresmen | $1,506,372 | $1,412,021 | $1,414,595 | $4,393,588 |
| Wages paid transporters | 263,683 | 264,497 | 198,848 | 727,028 |
| OPERATING UNITS | | | | |
| Plants: | | | | |
| Shore canneries | 37 | 49 | 24 | 110 |
| Floating canneries— | | | | |
| Power vessels | 2 | 1 | 1 | 4 |
| Net tonnage | 301 | 1,760 | 1,424 | 3,485 |
| Barges | 1 | 1 | | 2 |
| Net tonnage | 488 | 389 | | 877 |
| Total plants operated | 40 | 51 | 25 | 116 |
| Vessels: | | | | |
| Power, over 5 tons | 328 | 167 | 88 | 583 |
| Net tonnage | 6,975 | 4,244 | 34,199 | 45,418 |
| Launches | 90 | 192 | 26 | 308 |
| Power dories | 26 | 42 | 1 | 69 |
| Gill-net boats | 97 | 107 | 1,039 | 1,243 |
| Seine skiffs | 92 | 228 | 10 | 330 |
| Other rowboats and skiffs | 827 | 678 | 163 | 1,668 |
| Lighters and scows | 234 | 250 | 140 | 624 |
| Houseboats | 21 | 5 | 30 | 56 |
| Pile drivers | 29 | 40 | 17 | 86 |
| Pile pullers | 7 | 5 | | 12 |
| Rigging scows | 33 | 11 | | 44 |
| Apparatus: | | | | |
| Purse seines | 289 | 121 | 4 | 414 |
| Fathoms | 51,508 | 12,540 | 900 | 64,948 |
| Beach seines | 3 | 120 | | 123 |
| Fathoms | 300 | 14,429 | | 14,729 |
| Gill nets | 313 | 1,749 | [1] 1,474 | 3,536 |
| Fathoms | 18,060 | 80,117 | 145,270 | 243,447 |
| Traps, driven | 40 | 177 | 2 | 219 |
| Traps, floating | 234 | 25 | | 259 |

[1] Includes 188 stake nets of an average length of 25 fathoms each, used in the Bristol Bay area.

*Output and value of canned salmon in Alaska in 1931* [1]

| Product | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| Coho or silver: | | | | | | | | |
| ½-pound flat | 7,907 | $89,649 | 2,055 | $16,104 | | | 9,962 | $105,753 |
| 1-pound flat | 2,663 | 20,239 | 239 | 1,670 | | | 2,902 | 21,909 |
| 1-pound tall | 77,885 | 506,653 | 79,037 | 471,763 | 92 | $556 | 157,014 | 978,972 |
| Total | 88,455 | 616,541 | 81,331 | 489,537 | 92 | 556 | 169,878 | 1,106,634 |
| Chum or keta: | | | | | | | | |
| ½-pound flat | 3,992 | 20,745 | 250 | 912 | | | 4,242 | 21,657 |
| 1-pound flat | | | 35 | 140 | | | 35 | 140 |
| 1-pound tall | 270,256 | 870,630 | 192,768 | 606,056 | 66,555 | 202,202 | 529,579 | 1,678,888 |
| Total | 274,248 | 891,375 | 193,053 | 607,108 | 66,555 | 202,202 | 533,856 | 1,700,685 |
| Pink or humpback: | | | | | | | | |
| ½-pound flat | 44,149 | 246,768 | 2,375 | 13,112 | | | 46,524 | 259,880 |
| 1-pound flat | 2,242 | 8,849 | 2,168 | 7,805 | | | 4,410 | 16,654 |
| 1-pound tall | 1,967,051 | 6,797,186 | 935,875 | 3,141,778 | | | 2,902,926 | 9,938,964 |
| Total | 2,013,442 | 7,052,803 | 940,418 | 3,162,695 | | | 2,953,860 | 10,215,498 |
| King or spring: | | | | | | | | |
| ½-pound flat | 4,648 | 55,133 | 7,751 | 93,677 | 809 | 8,090 | 13,208 | 156,900 |
| 1-pound flat | 3,155 | 33,216 | 10,722 | 117,342 | 2,844 | 28,185 | 16,721 | 178,743 |
| 1-pound tall | 7,093 | 46,476 | 9,126 | 65,671 | 5,719 | 39,597 | 21,938 | 151,744 |
| Total | 14,896 | 134,825 | 27,599 | 276,690 | 9,372 | 75,872 | 51,867 | 487,387 |
| Red or sockeye: | | | | | | | | |
| ½-pound flat | 13,596 | 217,725 | 36,483 | 458,175 | 8,099 | 100,215 | 58,178 | 776,115 |
| 1-pound flat | 17,972 | 179,720 | 19,175 | 186,951 | 3,855 | 38,210 | 41,002 | 404,881 |
| 1-pound tall | 116,327 | 1,074,133 | 383,495 | 3,471,793 | 1,095,276 | 9,859,166 | 1,595,098 | 14,405,092 |
| Total | 147,895 | 1,471,578 | 439,153 | 4,116,919 | 1,107,230 | 9,997,591 | 1,694,278 | 15,586,088 |
| Grand total | 2,538,936 | 10,167,122 | 1,081,554 | 8,652,949 | 1,183,249 | 10,276,221 | 5,403,739 | 29,096,292 |

[1] Cases containing ½-pound cans have been reduced one-half in number, and thus, for the purpose of affording fair comparison, all are put upon the basis of forty-eight 1-pound cans to the case.

*Output of canned salmon in Alaska, in cases, 1926 to 1931* [1]

BY SPECIES

| Product | 1926 | 1927 | 1928 | 1929 | 1930 | Average for 5-year period, 1926–1930 | 1931 | Percentage of increase or decrease in 1931, as compared with 5-year average |
|---|---|---|---|---|---|---|---|---|
| Coho or silver: | | | | | | | | |
| ¼-pound flat | | | | | 371 | 74 | | −100.00 |
| ½-pound flat | 10,354 | 10,105 | 13,498 | 7,880 | 18,808 | 12,129 | 9,962 | −17.86 |
| 1-pound flat | 16,625 | 15,047 | 5,840 | 6,730 | 5,926 | 10,034 | 2,902 | −71.08 |
| 1-pound tall | 175,548 | 227,892 | 279,285 | 157,346 | 307,317 | 229,477 | 157,014 | −31.58 |
| Total | 202,527 | 253,044 | 298,623 | 171,956 | 332,422 | 251,714 | 169,878 | −32.51 |
| Chum or keta: | | | | | | | | |
| ½-pound flat | 1,367 | 9,414 | 5,057 | 4,961 | 8,384 | 5,837 | 4,242 | −27.33 |
| 1-pound flat | 48,982 | 1,449 | 4 | | | 10,087 | 35 | −99.65 |
| 1-pound tall | 852,094 | 496,860 | 990,724 | 859,551 | 591,550 | 758,156 | 529,579 | −30.15 |
| Total | 902,443 | 507,723 | 995,785 | 864,512 | 599,934 | 774,080 | 533,856 | −31.03 |

[1] The number of cases shown has been put upon the common basis of forty-eight 1-pound cans per case.

*Output of canned salmon in Alaska, in cases, 1926 to 1931*—Continued

BY SPECIES—Continued

| Product | 1926 | 1927 | 1928 | 1929 | 1930 | Average for 5-year period, 1926–1930 | 1931 | Percentage of increase or decrease in 1931, as compared with 5-year average |
|---|---|---|---|---|---|---|---|---|
| Pink or humpback: | | | | | | | | |
| ¼-pound flat | | | | | 1,113 | 222 | | −100.00 |
| ½-pound flat | 59,835 | 50,455 | 40,473 | 44,762 | 81,064 | 55,318 | 46,524 | −15.90 |
| 1-pound flat | 82,161 | 14,662 | 6,189 | 3,910 | 4,867 | 22,358 | 4,410 | −80.28 |
| 1-pound tall | 3,196,353 | 1,355,658 | 2,740,580 | 2,522,985 | 3,101,490 | 2,583,413 | 2,902,926 | +12.37 |
| Total | 3,338,349 | 1,420,775 | 2,787,242 | 2,571,657 | 3,188,534 | 2,661,311 | 2,953,860 | +10.99 |
| King or spring: | | | | | | | | |
| ½-pound flat | 3,324 | 10,528 | 11,782 | 16,320 | 17,840 | 11,959 | 13,208 | +10.44 |
| 1-pound flat | 11,125 | 11,371 | 14,854 | 26,808 | 23,686 | 17,569 | 16,721 | −4.83 |
| 1-pound tall | 38,027 | 48,492 | 27,523 | 28,979 | 18,396 | 32,283 | 21,938 | −32.04 |
| Total | 52,476 | 70,391 | 54,159 | 72,107 | 59,922 | 61,811 | 51,867 | −16.09 |
| Red or sockeye: | | | | | | | | |
| ¼-pound flat | | | | | 370 | 74 | | −100.00 |
| ½-pound flat | 82,181 | 88,874 | 89,063 | 100,136 | 110,605 | 94,172 | 58,178 | −38.22 |
| 1-pound flat | 104,329 | 57,771 | 87,106 | 75,326 | 62,972 | 77,500 | 41,002 | −47.09 |
| 1-pound tall | 1,970,577 | 1,173,550 | 1,771,931 | 1,514,465 | 677,567 | 1,421,618 | 1,595,098 | +12.20 |
| Total | 2,157,087 | 1,320,195 | 1,948,094 | 1,689,927 | 851,514 | 1,593,364 | 1,694,278 | +6.33 |
| Grand total | 6,652,882 | 3,572,128 | 6,083,903 | 5,370,159 | 5,032,326 | 5,342,280 | 5,403,739 | +1.15 |

BY DISTRICTS AND SPECIES

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Southeast Alaska: | | | | | | | | |
| Coho or silver | 96,389 | 114,970 | 145,770 | 97,847 | 155,052 | 122,126 | 88,455 | −27.57 |
| Chum or keta | 618,397 | 224,433 | 570,219 | 290,797 | 283,478 | 397,465 | 274,248 | −31.00 |
| Pink or humpback | 2,158,699 | 588,291 | 2,142,838 | 1,542,615 | 2,309,976 | 1,748,484 | 2,013,442 | +15.15 |
| King or spring | 10,679 | 8,031 | 5,522 | 7,000 | 6,939 | 7,634 | 14,896 | +95.13 |
| Red or sockeye | 173,891 | 116,468 | 106,798 | 162,952 | 221,241 | 156,270 | 147,895 | −5.36 |
| Total | 3,058,055 | 1,052,193 | 2,971,147 | 2,101,211 | 2,977,286 | 2,431,979 | 2,538,936 | +4.40 |
| Central Alaska: | | | | | | | | |
| Coho or silver | 104,309 | 138,034 | 152,360 | 71,330 | 173,352 | 127,877 | 81,331 | −36.40 |
| Chum or keta | 243,808 | 253,197 | 377,857 | 497,774 | 284,751 | 331,477 | 193,053 | −41.76 |
| Pink or humpback | 1,144,180 | 817,538 | 643,330 | 1,025,652 | 859,761 | 898,092 | 940,418 | +4.71 |
| King or spring | 23,683 | 43,470 | 35,036 | 35,661 | 32,060 | 33,982 | 27,599 | −18.78 |
| Red or sockeye | 630,505 | 318,864 | 430,572 | 454,086 | 268,621 | 420,530 | 439,153 | +4.43 |
| Total | 2,146,485 | 1,571,103 | 1,639,155 | 2,084,503 | 1,618,545 | 1,811,958 | 1,681,554 | −7.20 |
| Western Alaska: | | | | | | | | |
| Coho or silver | 1,829 | 40 | 493 | 2,779 | 3,418 | 1,712 | 92 | −94.63 |
| Chum or keta | 40,238 | 30,093 | 47,709 | 75,941 | 31,705 | 45,137 | 66,555 | +47.45 |
| Pink or humpback | 35,470 | 14,946 | 1,074 | 3,390 | 18,797 | 14,735 | | −100.00 |
| King or spring | 18,114 | 18,890 | 13,601 | 29,446 | 20,923 | 20,195 | 9,372 | −53.59 |
| Red or sockeye | 1,352,691 | 884,863 | 1,410,724 | 1,072,889 | 361,652 | 1,016,564 | 1,107,230 | +8.92 |
| Total | 1,448,342 | 948,832 | 1,473,601 | 1,184,445 | 436,495 | 1,098,343 | 1,183,249 | +7.73 |
| Grand total | 6,652,882 | 3,572,128 | 6,083,903 | 5,370,159 | 5,032,326 | 5,342,280 | 5,403,739 | +1.15 |

*Relative importance of each species of canned salmon within each district in 1931*

| District | Coho | Chum | Pink | King | Red | Total, all species |
|---|---|---|---|---|---|---|
| | *Per cent* | *Per cent* | *Per cent* | *Per cent* | *Per cent* | *Per cent* |
| Southeast Alaska | 3.5 | 10.8 | 79.3 | 0.6 | 5.8 | 100 |
| Central Alaska | 4.8 | 11.5 | 55.9 | 1.7 | 26.1 | 100 |
| Western Alaska | 0 | 5.6 | 0 | .8 | 93.6 | 100 |
| All Alaska | 3.1 | 9.9 | 54.7 | 1.0 | 31.3 | 100 |

*Relative importance of each district in the production of each species of salmon canned in 1931*

| District | Coho | Chum | Pink | King | Red | Total, all species |
|---|---|---|---|---|---|---|
| | *Per cent* | *Per cent* | *Per cent* | *Per cent* | *Per cent* | *Per cent* |
| Southeast Alaska | 52.0 | 51.4 | 68.2 | 28.7 | 8.7 | 47.0 |
| Central Alaska | 47.9 | 36.1 | 31.8 | 53.2 | 25.9 | 31.1 |
| Western Alaska | .1 | 12.5 | 0 | 18.1 | 65.4 | 21.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Average annual price per case of forty-eight 1-pound cans of salmon, 1921 to 1931*

| Product | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coho, or silver | $5.63 | $5.47 | $5.74 | $6.83 | $9.72 | $8.40 | $8.51 | $7.12 | $7.59 | $8.26 | $6.51 |
| Chum, or keta | 3.68 | 3.98 | 4.65 | 4.68 | 4.44 | 5.01 | 5.47 | 6.06 | 5.35 | 3.60 | 3.19 |
| Pink, or humpback | 4.21 | 4.34 | 4.86 | 4.93 | 5.28 | 5.39 | 5.87 | 6.56 | 6.06 | 4.17 | 3.46 |
| King, or spring | 10.22 | 8.08 | 8.56 | 8.89 | 11.91 | 10.37 | 11.25 | 11.13 | 11.92 | 13.32 | 9.40 |
| Red, or sockeye | 8.96 | 9.24 | 9.27 | 9.53 | 13.12 | 9.89 | 12.08 | 9.41 | 10.71 | 12.57 | 9.20 |

## PACK IN CERTAIN DISTRICTS

Statistics of the salmon pack are again presented for subdivisions of the three main districts of Alaska, and comparison is made with similar statistics for 1930. Where the pack at a given cannery is made up of fish from more than one district, as in the case of that at certain Cordova canneries which pack fish caught both in Prince William Sound and in the Copper River area or at various plants in southeastern Alaska which draw for their supply on the catch of more than one district, due segregation has been made in order to credit each district with the pack from salmon caught therein. These districts are described as follows:

### WESTERN ALASKA

*Bristol Bay.*—The Bering Sea shore, east and north of the Ugashik River.

*Port Moller and Herendeen Bay.*—Port Moller, Herendeen Bay, and Nelson Lagoon.

### CENTRAL ALASKA

*Ikatan-Shumagin Islands.*—False Pass, Ikatan Bay, King Cove, and the Shumagin Islands.

*Chignik.*—Canneries located at Chignik.

*Kodiak-Afognak Islands.*—Kodiak, Spruce, and Raspberry Islands.

*Cook Inlet.*—The shores of Cook Inlet.

*Prince William Sound.*—Extends from Resurrection Bay to Point Whitshed.

*Copper and Bering Rivers.*—Extends from Point Whitshed to Bering River.

SOUTHEASTERN ALASKA

*Yakutat and Dry Bay.*—Extends from Yakutat Bay to and including Dry Bay.

*Icy Strait-Lynn Canal.*—West coast of Baranof and Chichagof Islands, the shores of Cross Sound, Icy Strait, Lynn Canal, and Stephens Passage, south to Taku Harbor.

*Chatham Strait-Frederick Sound.*—Both shores of Chatham Strait and its bays from Point Augusta to Cape Ommaney, and through Frederick Sound and its bays northward to Taku Harbor, including Kake.

*Sumner Strait-Dixon Entrance.*—Extends southward from Petersburg and eastward from Port Beauclerc to Cape Chacon and Dixon Entrance and includes all canneries on the mainland and intervening islands from the Stikine River to Portland Canal.

*West coast, Prince of Wales Island.*—Territory west and south of a line from Cape Chacon to Point Baker and Cape Ommaney.

*Pack of canned salmon in Alaska in 1931, by districts* [1]

| District | Coho | Chum | Pink | King | Red | Total | Percentage of increase or decrease from 1930 |
|---|---|---|---|---|---|---|---|
| | *Cases* | *Cases* | *Cases* | *Cases* | *Cases* | *Cases* | |
| Bristol Bay | 92 | 61,721 | ---------- | 8,901 | 1,048,917 | 1,119,631 | +173.93 |
| Port Moller and Herendeen Bay | ---------- | 4,834 | ---------- | 471 | 58,313 | 63,618 | +171.83 |
| Ikatan-Shumagin Islands | 12,020 | 106,606 | 66,259 | 2,817 | 142,773 | 330,475 | −38.38 |
| Chignik | 4,286 | 4,018 | 11,259 | 269 | 67,291 | 87,123 | +560.57 |
| Kodiak-Afognak Islands | 15,880 | 16,174 | 454,177 | 395 | 90,657 | 577,283 | +206.74 |
| Cook Inlet | 30,231 | 5,513 | 31,356 | 13,180 | 58,055 | 138,335 | −31.90 |
| Prince William Sound | 6,283 | 60,742 | 377,367 | 232 | 20,897 | 465,521 | −12.77 |
| Copper and Bering Rivers | 12,631 | ---------- | ---------- | 10,706 | 59,480 | 82,817 | −44.19 |
| Yakutat and Dry Bay | 32,337 | 616 | 3,760 | 4,303 | 25,781 | 66,797 | −8.52 |
| Icy Strait-Lynn Canal | 13,469 | 62,475 | 475,984 | 2,677 | 43,789 | 598,394 | −36.13 |
| Chatham Strait-Frederick Sound | 7,464 | 50,851 | 532,609 | 1,072 | 8,448 | 600,444 | +1.80 |
| Sumner Strait-Dixon Entrance | 19,237 | 104,058 | 683,180 | 380 | 45,790 | 852,645 | −16.59 |
| West coast, Prince of Wales Island | 15,948 | 56,248 | 317,909 | 6,464 | 24,087 | 420,656 | +18.41 |
| Total | 169,878 | 533,856 | 2,953,860 | 51,867 | 1,694,278 | 5,403,739 | +7.38 |

[1] Pack reduced to the basis of forty-eight 1-pound cans per case.

## MILD CURING

The output of mild-cured salmon in Alaska was the smallest for any year since 1921, due primarily to unfavorable market conditions. Beginning early in June the trollers suspended operations for several weeks in an attempt to obtain higher prices. Their action failed in its purpose. A few fishermen reaped a good harvest during the period, and when the others resumed operations the early run of kings was virtually over.

Although there is shown a larger number of persons engaged in the industry, as well as of boats and lines operated, this increase is attributable to the more complete figures obtained in the enumeration of the trolling fleet by the bureau's employees, rather than to a gain in the extent of trolling operations. Eighteen plants were operated—17 in southeastern and 1 in western Alaska, a net decrease of 2 plants from the number reported for 1930.

The total production of mild-cured salmon was 3,320,800 pounds valued at $633,753, a decrease of 1,126,725 pounds in quantity and $234,969 in value as compared with the output of 1930. The pack consisted of 194,800 pounds of cohos and 3,126,000 pounds of kings, or in units of 800-pound tierces, 243 tierces of cohos and 3,907 tierces of kings.

*Persons engaged, wages paid, and operating units, Alaska salmon mild-curing industry, 1931*

| Item | Southeast Alaska | Western Alaska | Total |
|---|---|---|---|
| PERSONS ENGAGED | | | |
| Fishermen: | | | |
| Whites | 796 | 3 | 799 |
| Natives | 404 | 20 | 424 |
| Total | 1,200 | 23 | 1,223 |
| Shoresmen: | | | |
| Whites | 78 | 2 | 80 |
| Natives | 3 | 11 | 14 |
| Total | 81 | 13 | 94 |
| Transporters: | | | |
| Whites | 11 | | 11 |
| Natives | | 2 | 2 |
| Total | 11 | 2 | 13 |
| Grand total | 1,292 | 38 | 1,330 |
| Wages paid shoresmen | $56,072 | $3,050 | $59,122 |
| Wages paid transporters | 8,320 | 225 | 8,545 |

| Item | Southeast Alaska | Western Alaska | Total |
|---|---|---|---|
| OPERATING UNITS | | | |
| Plants: | | | |
| Shore | 14 | 1 | 15 |
| Floating— | | | |
| Barges | 3 | | 3 |
| Net tonnage | 720 | | 720 |
| Total plants operated | 17 | 1 | 18 |
| Vessels: | | | |
| Power, over 5 tons | 198 | | 198 |
| Net tonnage | 1,642 | | 1,642 |
| Launches | 683 | 1 | 684 |
| Gill-net boats | | 12 | 12 |
| Rowboats and skiffs | 118 | | 118 |
| Lighters and scows | 3 | | 3 |
| Houseboat | 1 | | 1 |
| Apparatus: | | | |
| Gill nets | | 16 | 16 |
| Fathoms | | 800 | 800 |
| Lines | 3,628 | | 3,628 |

*Products of Alaska salmon mild-curing industry in 1931*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | [1] 178,000 | $16,147 | [2] 16,800 | $1,425 | | | [3] 194,800 | $17,572 |
| King, or spring | [4] 3,065,200 | 610,144 | | | [5] 60,800 | $6,037 | [6] 3,126,000 | 616,181 |
| Total | 3,243,200 | 626,291 | 16,800 | 1,425 | 60,800 | 6,037 | 3,320,800 | 633,753 |

[1] 222 tierces. [2] 21 tierces. [3] 243 tierces. [4] 3,831 tierces. [5] 76 tierces. [6] 3,907 tierces.

## PICKLING

A marked increase over the average for recent years was apparent in the pickled-salmon output in 1931, the production being the largest since 1926. This increase was due primarily to the excellent runs of red salmon in the Bristol Bay region. Although production was stimulated by reason of the light stocks of pickled reds on hand and the fairly firm prices at the beginning of the year, the market was affected by general adverse conditions as the season advanced, and the increase in quantity was not accompanied by an increase in value of the product.

The western district regained its customary place as the principal producing center, contributing 62 per cent of the total Alaska output of pickled salmon, as compared with 19 per cent in 1930. The central district increased its output of pickled reds over that for 1930, but there was a decided curtailment in the production of cohos, with the result that the total output for the district showed an appreciable decline. In southeastern Alaska there was a decline in the output of all species as compared with the preceding year.

One hundred and forty-three persons were engaged in the industry in 1931, an increase of 29 over the previous year, and the number of plants operated increased from 11 to 18, of which 1 was in southeast-

ern, 8 were in central, and 9 in western Alaska. Production in southeastern Alaska decreased from 151,600 pounds in 1930 to 77,800 pounds in 1931, and in central Alaska from 544,100 to 354,450 pounds. In western Alaska there was an increase from 167,250 pounds in 1930 to 708,950 pounds in 1931. The total output in 1931 was 1,141,200 pounds valued at $103,508, as compared with 862,950 pounds valued at $103,641 in 1930—an increase of approximately 32 per cent in quantity and a decrease of 0.1 per cent in value.

*Persons engaged, wages paid, and operating units, Alaska salmon-pickling industry, 1931*

| Items | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 2 | 29 | 30 | 61 |
| Natives | | 5 | 31 | 36 |
| Total | 2 | 34 | 61 | 97 |
| Shoresmen: | | | | |
| Whites | | | 18 | 18 |
| Natives | | 1 | 26 | 27 |
| Total | | 1 | 44 | 45 |
| Transporter: White | | | 1 | 1 |
| Grand total | 2 | 35 | 106 | 143 |
| Wages paid shoresmen | | $54 | $16,116 | $16,170 |
| Wages paid transporter | | | 250 | 250 |
| OPERATING UNITS | | | | |
| Plants: | | | | |
| Shore | 1 | 8 | 7 | 16 |
| Floating— | | | | |
| Power vessel | | | 1 | 1 |
| Net tonnage | | | 38 | 38 |
| Scow | | | 1 | 1 |
| Total plants operated | 1 | 8 | 9 | 18 |
| Vessels: | | | | |
| Power, over 5 tons | 2 | 2 | 3 | 7 |
| Net tonnage | 26 | 12 | 46 | 84 |
| Launches | | 7 | 1 | 8 |
| Power dories | | 6 | 2 | 8 |
| Gill-net boats | 1 | 11 | 22 | 34 |
| Seine skiffs | | 10 | 1 | 11 |
| Rowboats | 1 | 12 | 10 | 23 |
| Lighters and scows | 1 | | 3 | 4 |
| Apparatus: | | | | |
| Purse seines | | 3 | | 3 |
| Fathoms | | 175 | | 175 |
| Beach seines | | 13 | 3 | 16 |
| Fathoms | | 1,005 | 205 | 1,210 |
| Gill nets | 2 | 77 | 83 | 162 |
| Fathoms | 100 | 2,406 | 4,120 | 6,726 |
| Wheels | | | 3 | 3 |

*Products of Alaska salmon-pickling industry in 1931*

| Species | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | 36,400 | $3,052 | 121,550 | $9,701 | 800 | $60 | 158,750 | $12,813 |
| Chum, or keta | | | 2,600 | 156 | 25,910 | 1,582 | 28,510 | 1,738 |
| Pink, or humpback | 23,800 | 1,399 | 14,400 | 913 | | | 38,200 | 2,312 |
| King, or spring | 3,600 | 270 | 17,800 | 1,950 | 99,540 | 10,459 | 120,940 | 12,679 |
| Red, or sockeye | 14,000 | 1,400 | 198,100 | 18,441 | 582,700 | 54,125 | 794,800 | 73,966 |
| Total | 77,800 | 6,121 | 354,450 | 31,161 | 708,950 | 66,226 | 1,141,200 | 103,508 |

### FRESH SALMON

Operations in the fresh-salmon business in 1931 were carried on only in southeastern Alaska and were for the most part incidental to the mild curing of salmon. Three dealers whose chief product was fresh salmon gave employment to five white shoresmen. The total production was 768,619 pounds, valued at $55,918, against 1,295,216 pounds valued at $117,620 in 1930—a decrease of approximately 41 per cent in quantity and 52 per cent in value.

*Products of the Alaska fresh-salmon industry in 1931*

| Species | Pounds | Value |
|---|---|---|
| Coho, or silver | 64,495 | $1,538 |
| Chum, or keta | 168 | 2 |
| Pink, or humpback | 28 | 1 |
| King, or spring | 703,907 | 54,376 |
| Red, or sockeye | 21 | 1 |
| Total | 768,619 | 55,918 |

### FREEZING

The production of frozen salmon, although somewhat less than the record output of 1930, was well above the average for recent years. As usual, the bulk of the product was handled at the six cold-storage plants in southeastern Alaska. Two of these plants, whose chief product was frozen salmon, gave employment to 22 white shoresmen. The total output in 1931 was 6,182,917 pounds, valued at $411,815—a decrease of about 7 per cent in quantity and 27 per cent in value from the production in 1930, when 6,614,206 pounds, valued at $561,848, were prepared.

#### FILLETING

Included in the frozen-salmon product are 190,818 pounds of fillets, consisting of 3,674 pounds of cohos, valued at $441; 262 pounds of chums, valued at $24; and 186,882 pounds of pinks, valued at $18,688, prepared at Ketchikan for shipment to the Atlantic Coast Fisheries Co. This is not the first season for the handling of this product in Alaska, as a fair quantity had been prepared at Ketchikan in 1928, which was said to have had a ready sale in the eastern market.

*Products of the frozen-salmon industry in 1931*

| Species | Southeast Alaska | | Central Alaska | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Coho, or silver | [1] 3,021,511 | $194,808 | 22,800 | $644 | [1] 3,044,311 | $195,452 |
| Chum, or keta | [2] 316,551 | 11,673 | | | [2] 316,551 | 11,673 |
| Pink, or humpback | [3] 369,475 | 22,171 | | | [3] 369,475 | 22,171 |
| King, or spring | 2,450,089 | 182,390 | | | 2,450,089 | 182,390 |
| Red, or sockeye | 2,491 | 129 | | | 2,491 | 129 |
| Total | 6,160,117 | 411,171 | 22,800 | 644 | 6,182,917 | 411,815 |

[1] Includes 3,674 pounds of fillets, valued at $441.
[2] Includes 262 pounds of fillets, valued at $24.
[3] Includes 186,882 pounds of fillets, valued at $18,688.

## DRY-SALTED, DRIED, SMOKED, AND OTHER MISCELLANEOUS SALMON PRODUCTS

Small quantities of dry-salted salmon were prepared in southeastern and western Alaska at two plants engaged primarily in the herring fishery. Two salmon salteries in central Alaska prepared kippered salmon in connection with their other operations, while in southeastern Alaska a plant that employed six white shoresmen was engaged in canning kippered salmon, of which product 111 cases, or 5,328 pounds, were packed.

In the fishery of the Yukon, Tanana, and Kuskokwim Rivers, which is carried on principally by natives, 1,240,000 pounds of chum salmon were dried, valued at $74,600; and in addition 576 pounds of beleke from kings, valued at $115, and 700 pounds of kippered kings, valued at $100, were prepared. In this western district 12 whites and 610 natives engaged in the fishery, and the apparatus used consisted of 256 wheels, 789 gill nets of 10,592 fathoms, 50 rowboats and skiffs, and 4 gill-net boats.

The production of miscellaneous salmon products incidental to the canning of salmon consisted of 70 cases (forty-eight 1-pound cans to the case) of fish pudding from coho salmon and 78 cases (forty-eight ½-pound cans to the case) of fish pudding from chums, with a total value of $950, in central Alaska, and 20½ barrels, or 4,100 pounds, of salmon eggs for caviar, valued at $500, in western Alaska.

*Production of dry-salted, dried, smoked, and other miscellaneous salmon products in Alaska in 1931*

| Product | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Dry-salted: | | | | | | | | |
| Coho, or silver | 7,600 | $380 | | | | | 7,600 | $380 |
| Red, or sockeye | | | | | 23,850 | $2,120 | 23,850 | 2,120 |
| Total | 7,600 | 380 | | | 23,850 | 2,120 | 31,450 | 2,500 |
| Dried: Chum, or keta | | | | | 1,240,000 | 74,600 | 1,240,000 | 74,600 |
| Kippered: | | | | | | | | |
| Coho, or silver | | | 8,000 | $800 | | | 8,000 | 800 |
| Pink, or humpback | | | 1,450 | 145 | | | 1,450 | 145 |
| King, or spring | | | | | 700 | 100 | 700 | 100 |
| Total | | | 9,450 | 945 | 700 | 100 | 10,150 | 1,045 |
| Fish pudding: | | | | | | | | |
| Coho, or silver | | | 3,360 | 560 | | | 3,360 | 560 |
| Chum, or keta | | | 1,872 | 390 | | | 1,872 | 390 |
| Total | | | 5,232 | 950 | | | 5,232 | 950 |
| Smoked and packed in olive oil: King, or spring | 5,328 | 999 | | | | | 5,328 | 999 |
| Beleke: King, or spring | | | | | 576 | 115 | 576 | 115 |
| Salmon eggs: Red, or sockeye | | | | | 4,100 | 500 | 4,100 | 500 |
| Grand total | 12,928 | 1,379 | 14,682 | 1,895 | 1,269,226 | 77,435 | 1,296,836 | 80,709 |

## BY-PRODUCTS

The preparation of salmon by-products was carried on at two plants in southeastern Alaska which were engaged solely in that business, giving employment to 22 white shoresmen and 6 white transporters. In central Alaska four salmon canneries manufactured salmon oil and

fertilizer also, and a new reduction plant was established by the Alaska Salmon Meal & Oil Co. at Tiedeman Bay, although it was operated only a short time during the season. The total production was 1,585,288 pounds of fertilizer, valued at $29,094, and 54,980 gallons of oil, valued at $12,312, as compared with 2,283,882 pounds of fertilizer, valued at $51,674, and 55,883 gallons of oil, valued at $10,525, in 1930—a decrease of about 31 per cent in the amount of fertilizer and 2 per cent in the quantity of oil.

*Production of salmon oil and fertilizer in Alaska in 1931*

| Disrtict | Oil | | Fertilizer | |
|---|---|---|---|---|
| | Gallons | Value | Pounds | Value |
| Southeast Alaska | 29,000 | $3,770 | 1,020,000 | $20,040 |
| Central Alaska | 25,980 | 8,542 | 565,288 | 9,054 |
| Total | 54,980 | 12,312 | 1,585,288 | 29,094 |

## HERRING

A continuation of the generally low price levels on fishery products brought about a sharp curtailment in herring operations in Alaska in 1931, a number of the larger salting and reduction plants in the southeastern district remaining inactive throughout the year. Production of herring oil and meal fell far behind that of 1930, showing a net decrease of more than 18,000,000 pounds in quantity and $880,000 in value. The output of Scotch-cured herring, however, was on about the same scale as in the preceding year; southeastern Alaska increased the pack of this product considerably, while the central and western districts dropped somewhat behind 1930 figures.

The runs of herring were much lighter in the Prince William Sound and Kodiak districts than in 1930, and there was little or no betterment in the size and quality of the fish. No production is recorded for the Cook Inlet district, and the Golovin Bay output was considerably below the average for recent years. Herring of unusually large size and fine quality were quite abundant in the Aleutian Islands region. While most of the operations in this district were centered at Dutch Harbor, the motor ship *Donna Lane*, of the Utopian Fisheries (Inc.), and the schooner *Alice Cooke*, of the Kalgin Packing Co., were stationed in Akutan Bay, where they secured fair-sized packs of Scotch-cured fish. In the southeastern district herring were abundant, particularly toward the latter part of the season in the lower Chatham Strait region; and although small, they were of good quality for packing. Production of bait herring decreased considerably from that for 1930, and no importation of herring from British Columbia was reported.

The number of floating plants engaged in the herring industry remained the same as in 1930. The schooner *Alice Cooke*, owned by the Kalgin Packing Co., and the motorship *Donna Lane*, of the Utopian Fisheries (Inc.), were operated in both the central and western districts, while the schooner *Rosamond*, belonging to the North American Fisheries, was used exclusively in central Alaska.

Although many of the herring plants in southeastern Alaska were idle during the season, production of oil and meal was chiefly centered

in this region, where all the reduction plants operated also produced Scotch-cured fish. The output of by-products in the southeastern district decreased from 19,502,823 pounds of meal and 2,943,915 gallons of oil in 1930 to 14,000,276 pounds of meal and 1,910,242 gallons of oil in 1931. Production of Scotch-cured herring in this district increased from 1,382,895 pounds in 1930 to 1,759,475 pounds in 1931.

In Central Alaska there was a slight decrease in the production of Scotch-cured herring, the pack amounting to 2,960,350 pounds, as compared with 3,011,375 pounds in 1930. The output of by-products in this district decreased very sharply from 3,908,200 pounds of meal and 601,507 gallons of oil in 1930 to 1,822,700 pounds of meal and 242,464 gallons of oil in 1931. This curtailment in the output of by-products was due to the reluctance of operators to manufacture meal and oil at the prevailing low prices, rather than to scarcity of fish.

The Scotch-cured pack of western Alaska fell somewhat below that of 1930. In that year 3,686,975 pounds were produced, as compared with 3,291,225 pounds in 1931.

Twenty concerns handled herring in southeastern Alaska in 1931, a decrease of eight from the number engaged in the previous year. Five were cold-storage plants that froze herring for bait and eight engaged only in the production of herring for bait. Listed below are the companies that engaged in the curing and reduction of herring in this district:

| | |
|---|---|
| Arentsen & Co | Big Port Walter. |
| Atlas Packing Corporation | Deep Cove. |
| Buchan & Heinen Packing Co | Port Armstrong. |
| Northwestern Herring Co | Port Conclusion. |
| Storfold & Grondahl Packing Co | Washington Bay. |

In central Alaska 11 operators engaged in pickling herring, the bulk of the pack again being prepared in the Kodiak and Prince William Sound areas. Two concerns—one in Izhut Bay and the other in Falls Bay—produced bait herring only. The more important operators in the district were as follows:

| | |
|---|---|
| Salteries: | |
| Apex Fish Co | Kodiak. |
| Albert Coel | Shuyak Harbor. |
| Kalgin Packing Co. (floating plant) | Prince William Sound and Kodiak. |
| North American Fisheries (floating plant) | Sitkalidak Strait. |
| Utopian Fisheries (Inc.) (floating plant) | Port Hobron. |
| Saltery and reduction plants: | |
| Chatham Strait Fish Co | Crab Bay. |
| Johnson Fisheries Co | Thumb Bay. |
| Port Benny Packing Co | Port Benny. |

Of the following operators in the western Alaska district all but two were engaged in the fishery in the Aleutian Islands area and all produced pickled herring, chiefly Scotch cured:

| | |
|---|---|
| Austnes & Rod | Unalaska. |
| Campbell & Dougal | Dutch Harbor. |
| Jordan Columbus | Do. |
| Conrad Packing Co | Golovin Bay. |
| Golovin Bay Packing Co | Do. |
| Hovland & Boe | Dutch Harbor. |
| Ed. Jacobsen & Co | Do. |
| Hans Johnson (floating plant) | Do. |

| | |
|---|---|
| Kalgin Packing Co. (floating plant) | Akutan. |
| C. P. Madsen & Soren Karlsen | Dutch Harbor. |
| James W. Manson | Do. |
| Olaf Olson | Do. |
| Polar Packing Co | Unalaska. |
| Utopian Fisheries (Inc.) (floating plant) | Akutan. |

Property losses reported in the herring fishery consisted of the destruction by fire of the schooner *Alice Cooke*, valued at $10,000; and the loss of 300 barrels of herring, valued at $4,500, and miscellaneous items of fishing gear and small boats having a total value of $6,955. One fisherman lost his life by drowning.

Dr. George A. Rounsefell, aquatic biologist of the bureau, aided by two assistants, continued the study and investigations of the Alaska herring along the lines followed during the last several years. A small power vessel was purchased by the bureau in 1931 for Doctor Rounsefell's use during the fishing season, thus facilitating the field work.

## STATISTICAL SUMMARY

Seven hundred and thirty persons were engaged in the Alaska herring industry in 1931, as compared with 1,413 in 1930, and the number of plants decreased from 39 to 29. Products of the fishery were valued at $1,227,896, a decrease of $905,781, or approximately 42 per cent from 1930, when the total value was $2,133,677. Scotch-cured herring decreased from 8,081,245 pounds in 1930 to 8,011,050 pounds in 1931, or about 1 per cent; herring for bait decreased from 9,298,140 to 7,607,797 pounds, or about 18 per cent; meal decreased approximately 32 per cent in quantity and 58 per cent in value; and oil decreased 39 per cent in quantity and 57 per cent in value, compared with the production for 1930.

*Persons engaged, wages paid, and operating units, Alaska herring industry, 1931*

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| Fishermen: | | | | |
| Whites | 211 | 80 | 42 | 333 |
| Natives | 1 | 2 | 11 | 14 |
| Total | 212 | 82 | 53 | 347 |
| Shoresmen: | | | | |
| Whites | 143 | 110 | 74 | 327 |
| Natives | | 18 | 24 | 42 |
| Japanese | | | 1 | 1 |
| Total | 143 | 128 | 99 | 370 |
| Transporters: Whites | | 3 | 10 | 13 |
| Grand total | 355 | 213 | 162 | 730 |
| Wages paid shoresmen | $75,682 | $48,230 | $21,916 | $145,828 |
| Wages paid transporters | | 1,068 | 10,588 | 11,656 |
| OPERATING UNITS | | | | |
| Plants: | | | | |
| Shore | 5 | 7 | 14 | 26 |
| Floating— | | | | |
| Power vessel | | | 1 | 1 |
| Net tonnage | | | 1,597 | 1,597 |
| Sailing vessels | | 2 | | 2 |
| Net tonnage | | 1,857 | | 1,857 |
| Total plants operated | 5 | 9 | 15 | 29 |

*Persons engaged, wages paid, and operating units, Alaska herring industry, 1931*—Continued

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| OPERATING UNITS—continued | | | | |
| Vessels: | | | | |
| Power, over 5 tons | 34 | 16 | 4 | 54 |
| Net tonnage | 998 | 453 | 88 | 1,539 |
| Launches | 4 | 11 | 22 | 37 |
| Gill-net boats | | | 10 | 10 |
| Seine skiffs | 21 | 12 | 4 | 37 |
| Other rowboats and skiffs | 26 | 11 | 9 | 46 |
| Lighters and scows | 3 | | | 3 |
| Pile drivers | 2 | 1 | | 3 |
| Apparatus: | | | | |
| Purse seines | 36 | 14 | 1 | 51 |
| Fathoms | 5,847 | 2,283 | 173 | 8,303 |
| Beach seines | | 2 | | 2 |
| Fathoms | | 100 | | 100 |
| Gill nets | | | 90 | 90 |
| Fathoms | | | 2,425 | 2,425 |
| Pound seines | 14 | 5 | 2 | 21 |
| Pounds | 2 | 12 | 1 | 15 |

*Products of Alaska herring industry in 1931*

| Item | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Fresh, for bait | 1,910,100 | $26,763 | 946,762 | $12,469 | 29,250 | $351 | 2,886,112 | $39,583 |
| Frozen, for bait | 4,675,060 | 36,566 | 46,625 | 746 | | | 4,721,685 | 37,312 |
| Frozen, for food | | | | | 236,500 | 9,460 | 236,500 | 9,460 |
| Pickled, for food: | | | | | | | | |
| Scotch cure | 1,759,475 | 107,097 | 2,960,350 | 167,217 | 3,291,225 | 199,493 | 8,011,050 | 473,807 |
| Norwegian cure | 200 | 15 | 29,500 | 2,006 | 130,800 | 8,790 | 160,500 | 10,811 |
| Roused, for food (bloater stock) | | | | | 92,400 | 4,266 | 92,400 | 4,266 |
| Spiced | 2,000 | 250 | | | | | 2,000 | 250 |
| Dry salted | | | | | 73,050 | 3,000 | 73,050 | 3,000 |
| Meal | 14,000,276 | 242,736 | 1,822,700 | 30,089 | | | 15,822,976 | 272,825 |
| Oil | [1]14,326,815 | 334,246 | [2]1,818,480 | 42,336 | | | [3]16,145,295 | 376,582 |
| Total | 36,673,926 | 747,673 | 7,624,417 | 254,863 | 3,853,225 | 225,360 | 48,151,568 | 1,227,896 |

[1] 1,910,242 gallons. [2] 242,464 gallons. [3] 2,152,706 gallons.

## HALIBUT

Several factors, the most important of which was the continued unsettled market, contributed to bring the production of halibut in Alaska substantially below that for 1930. During the first month of the season landings were negligible because of a dispute between vessel owners and fishermen over terms of the working agreement, and the suspension of operations pending its settlement, together with the shortening of the season in the fall in accordance with new treaty provisions, resulted in greatly reducing the time spent in fishing as compared with former seasons.

An interesting feature of the 1931 season was the organization of an association composed of vessel owners and fishermen to market their product independently. Doing business under the name of the United Pacific Fisheries, the association based its operations on a cooperative plan to pay the members for their fish at a fixed minimum price, with a pro rata distribution at intervals of any profit accruing from the sales. The experiment at first gave promise of being successful, op-

erations being conducted on a large scale for nearly two months, but toward the end of April the association was unable to buy the heavy stocks of halibut concentrated at Seattle and elsewhere, and the open auction method of selling was resumed. Prices declined rapidly at this time, and later in the season they reached the lowest levels recorded for recent years.

The U. S. Coast Guard again maintained a patrol of the fishing grounds to render any needed assistance to vessels of the halibut fleet. No major disaster occurred during the season. Two men were lost at sea and one died from exposure as the result of a wreck. Of the Alaska fleet, the schooner *Northern* was destroyed by fire following an explosion in Sumner Strait; the *Monroe* was wrecked on a reef in the vicinity of Wingham Island and became a total loss; the *Little Venus* was blown ashore near Union Bay and badly damaged; and the *Akutan* was considerably damaged in going aground at Ketchikan. The Puget Sound schooners *Democrat* and *Marmot* were lost in the vicinity of Kodiak Island, the former sinking in deep water after striking a reef, and the latter being destroyed by fire. The *Kalart* was wrecked and lost off an island in the Gulf of Alaska.

Life-history studies of the Pacific halibut were continued under the direction of Dr. William F. Thompson of the International Fisheries Commission. The schooner *Dorothy* was again chartered for this work and covered more than 10,000 miles along the coasts of British Columbia and Alaska during the season. In addition to the biological investigations, statistical data on the commercial fishery were collected and analyzed as a basis for determining effective conservation measures. Additional regulatory powers were vested in the commission by the new treaty of May 9, 1930, between the Dominion of Canada and the United States for the preservation of the Northern Pacific halibut fishery, which treaty became effective May 9, 1931, with the formal exchange of ratifications at Ottawa. In the exercise of this authority the commission seeks to maintain a close contact with the industry through conferences with representatives of the vessel owners and fishermen. Public hearings were held at Seattle and Prince Rupert in November, at which time proposed new regulations were discussed.

## STATISTICAL SUMMARY

Nine hundred and forty-six persons were engaged in the halibut industry in 1931, a decrease of 230 from the number reported for the preceding year, and the products totaled 20,425,633 pounds, valued at $1,352,687. This output represents the total fares of the Alaska halibut fleet, which comprises all American vessels landing more than one-half of their catch in Alaska or British Columbia ports rather than in the States. Landings of halibut in Alaska totaled 9,626,118 pounds, valued at $608,480. In 1930 the landings of the Alaska fleet were 31,557,084 pounds, valued at $2,991,400, while landings in Alaska totaled 11,408,984 pounds, valued at $863,089. Thus the decrease in fares of the Alaska fleet was 11,131,451 pounds, or approximately 35 per cent in quantity and 55 per cent in value, while landings at Alaska ports decreased 1,782,866 pounds, or about 16 per cent in quantity and 29 per cent in value from the preceding year.

*Persons engaged, wages paid, and operating units, Alaska halibut industry, 1931*

| Items | Southeast Alaska | Central Alaska | Total | Items | Southeast Alaska | Central Alaska | Total |
|---|---|---|---|---|---|---|---|
| PERSONS ENGAGED | | | | Wages paid shoresmen | $110,291 | $11,138 | $121,429 |
| Fishermen: Whites | 815 | | 815 | OPERATING UNITS | | | |
| Shoresmen: | | | | Vessels: | | | |
| Whites | 106 | 15 | 121 | Power, over 5 tons | 123 | | 123 |
| Natives | 6 | | 6 | Net tonnage | 2,663 | | 2,663 |
| Filipinos | 2 | | 2 | Launches | 17 | | 17 |
| Mexicans | 2 | | 2 | Dories | 123 | | 123 |
| Total | 116 | 15 | 131 | Skates of lines | 3,838 | | 3,838 |
| Grand total | 931 | 15 | 946 | | | | |

*Products of the Alaska halibut fishery in 1931*

| Products | Southeast Alaska | | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Fresh (including local) | 13,681,622 | $942,135 | 117,070 | $8,948 | 12,588 | $496 | 13,811,280 | $951,579 |
| Frozen | [1] 5,337,364 | 335,725 | 1,157,737 | 57,019 | 116,812 | 8,177 | 6,611,913 | 400,921 |
| Cheeks, frozen | | | 2,032 | 102 | | | 2,032 | 102 |
| Pudding | | | [2] 408 | 85 | | | 408 | 85 |
| Total | 19,018,986 | 1,277,860 | 1,277,247 | 66,154 | 129,400 | 8,673 | 20,425,633 | 1,352,687 |

[1] Includes 52,417 pounds of frozen fillets, valued at $4,718.
[2] 17 cases (48 ½-pound cans to the case).

## COD

The number of independent fishermen engaged in cod-fishing operations from shore stations in Alaska in 1931 was somewhat larger than in the preceding year, and the output also showed a considerable increase. In the offshore fishery, on the other hand, there was a marked curtailment of fishing effort, only four schooners being sent to Bering Sea, as compared with eight in 1930. These vessels were the *C. A. Thayer* (390 tons) operated by the Pacific Coast Codfish Co., the *Wawona* (413 tons) by the Robinson Fisheries Co., and the *Louise* (328 tons) and *William H. Smith* (496 tons) by the Union Fish Co. The products of the offshore fishery are not included in the following table because the vessels operate from and land their fares in ports of the Pacific Coast States.

There were 47 persons engaged in the cod fishery in 1931—6 more than in 1930. Operations were again centered in the Shumagin Islands region. Products aggregated 414,898 pounds valued at $23,650, as compared with 322,237 pounds valued at $16,789 in 1930. Products of the offshore fishery consisted of 3,352,011 pounds of dry-salted cod valued at $220,129, as against 5,963,204 pounds valued at $302,118 in 1930. The offshore fishery employed 147 persons, or 122 less than in the previous year.

*Persons engaged, wages paid, and operating units, Alaska cod industry, 1931*

| Item | Central Alaska | Western Alaska | Total |
|---|---|---|---|
| PERSONS ENGAGED | | | |
| Fishermen: | | | |
| Whites | 44 | 2 | 46 |
| Native | | 1 | 1 |
| Total | 44 | 3 | 47 |
| OPERATING UNITS | | | |
| Shore stations | 11 | 1 | 12 |
| Vessels: | | | |
| Power, over 5 tons | 1 | 1 | 2 |
| Net tonnage | 15 | 14 | 29 |
| OPERATING UNITS—contd. | | | |
| Vessels—Continued. | | | |
| Launch | 1 | | 1 |
| Power dories | 40 | | 40 |
| Rowboats | 4 | 2 | 6 |
| Apparatus: | | | |
| Trawl lines | 36 | | 36 |
| Hooks | 12,050 | | 12,050 |
| Hand lines | 61 | 5 | 66 |

*Products of Alaska cod industry in 1931*

| Item | Central Alaska | | Western Alaska | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Dry-salted cod | 58,800 | $2,702 | 90,000 | $4,500 | 148,800 | $7,202 |
| Stockfish | 119,300 | 11,930 | | | 119,300 | 11,930 |
| Pickled cod | 146,398 | 4,471 | | | 146,398 | 4,471 |
| Tongues | 400 | 47 | | | 400 | 47 |
| Total | 324,898 | 19,150 | 90,000 | 4,500 | 414,898 | 23,650 |

## WHALES

For the first time since the first whaling plant was established in Alaska in 1907, there was a complete suspension of whaling operations there in 1931. A similar situation existed along the entire American coast of the North Pacific Ocean and was attributed to the low prices on whale oil, which made profitable operations impossible. The American Pacific Whaling Co. leased its dock and some of the buildings at Port Hobron to the Utopian Fisheries (Inc.) for use in the herring industry.

## CLAMS

Conditions in the clam industry in 1931 were apparently much more favorable than in any other branch of the Alaska fisheries. The output showed a substantial increase over that for 1930, being the largest for any year since 1925, and there was no appreciable decrease in the unit prices. The larger pack was attributed partly to the 15-day extension of the fishing season in the Prince William Sound and Copper River areas and partly to the exploitation of new bars, as well as an increase in the number of clam diggers. While the bulk of the product consisted of razor clams from central Alaska—where two plants were engaged exclusively in canning clams and two packed both salmon and clams—a fair quantity of butter clams was handled in the southeastern district at the plant of the Alaskan Glacier Sea Food Co., which put up an experimental pack of this species in the preceding year.

Observations of the clam beds in the Seward-Katalla district were made during the season under the direction of Seton H. Thompson,

and it was stated that the beds were in a generally satisfactory condition, with an abundance of young clams. It was also pointed out that of the clams taken in the commercial fishery in 1931, 80 per cent were mature. In the Kodiak area the beaches from Swikshak Lagoon to Cape Douglas did not yield as many razor clams as usual, due to the difficulty of obtaining them rather than to a decrease in the abundance. This locality produced about half of the pack of the Kodiak area, the remainder being secured in Kashvik Bay on the mainland and in Halibut Bay on Kodiak Island, about 25 miles south of Cape Karluk.

Employment was given to 340 persons, of whom 322 were whites, 5 natives, 7 Japanese, and 6 Filipinos. The output consisted of 42,292 cases, containing 1,107,762 pounds, and 100 dozen clams in the shell, with a total value of $312,457—an increase of approximately 30 per cent in quantity and 29 per cent in value over the production in 1930, when 852,924 pounds, valued at $241,890, were prepared.

Property losses were reported in the amount of $300, consisting of the loss of a skiff and damage to a cannery building.

*Products of Alaska clam industry in 1931*

| Item | Cases | Pounds | Value |
|---|---|---|---|
| Minced: | | | |
| ½-pound cans (48 to case) | 30,031 | 720,744 | $215,105 |
| 10-ounce cans (48 to case) | 10,597 | 317,910 | 86,541 |
| 1-pound cans (48 to case) | 100 | 4,800 | 1,000 |
| Whole: | | | |
| 1-pound cans (48 to case) | 966 | 46,368 | 6,949 |
| 5-pound cans (6 to case) | 585 | 17,550 | 2,779 |
| Juice: 5-pound cans (6 to case) | 13 | 390 | 33 |
| Total | 42,292 | 1,107,762 | 312,407 |
| Fresh, in shell: 100 dozen | ---------- | 240 | 50 |
| Grand total | ---------- | 1,108,002 | 312,457 |

## SHRIMP

Two plants in southeastern Alaska—that of the Alaskan Glacier Sea Food Co. at Petersburg and the Reliance Shrimp Co.'s plant at Wrangell—again engaged in the shrimp industry, while in central Alaska a small quantity of shrimp was handled as an experiment by the Northern Seafood Co. at Cordova. Although operations were on about the same scale as in the preceding year, with a slightly larger number of persons employed, there was a considerable decline in the amount of the product, which was the smallest since 1922.

The number of persons engaged in the shrimp industry was 117, of whom 15 were whites, 65 natives, 21 Japanese, 10 Filipinos, 5 Mexicans, and 1 Chinese. Products consisted of 457,405 pounds of shrimp meat, valued at $184,050, and 2,645 pounds of fresh shrimp in the shell, valued at $397, a total of 460,050 pounds, valued at $184,447. Comparable figures for 1930 show a production of 513,826 pounds, valued at $210,503.

## CRABS

The Northern Seafood Co. at Petersburg was again the chief producer of crab meat in southeastern Alaska, while a small quantity of the product was prepared by a plant at Wrangell in connection with other shellfish operations. Three operators were engaged in the in-

dustry in central Alaska—the Alaska Sea Products (Inc.), Northern Seafood Co., and Ed Pfister, all of Cordova. Employment was given to 67 whites, 7 Filipinos, and 1 Mexican. Products consisted of 99,957 pounds of cold-packed meat, valued at $39,078, 522 dozen crabs in the shell, valued at $884, and 263 cases canned (forty-eight ½-pound cans to the case), valued at $2,104. The total value of products in 1931 was $42,066, as compared with $35,397 in 1930—an increase of approximately 19 per cent.

### JAPANESE VESSELS IN BERING SEA

Crab-canning operations were again carried on in Bering Sea by Japanese fishing interests, whose activities were largely of an experimental nature. No report has been received by the bureau as to the amount of the product secured by them in these waters in 1931. The floating crab cannery *Nagato Maru* spent some three months in the district, where its launches were observed operating about 5 miles northwest of Unimak Island, in the vicinity of Amak Island, and farther to the eastward in the same general locality as the *Taihoku Maru* operated during the previous year. The trawler *Kokusai Maru* also was in the Bering Sea region for a number of weeks, making stops at Attu, Atka, and Unalaska. It is understood that the cruise of the latter vessel was primarily in connection with a proposed good-will visit of Japanese fliers to this country, but that attention also was given to conditions affecting the fisheries.

## TROUT

Trout operations in southeastern Alaska in 1931 were incidental to other branches of the fishery industry, while in the central district a small output was reported by independent operators who gave employment to four white fishermen. The products were as follows: Dolly Vardens, 49,797 pounds fresh, valued at $4,975; 6,502 pounds frozen, valued at $469; and 400 pounds pickled, valued at $36; steelheads, 6,155 pounds fresh, valued at $458; 21,220 pounds frozen, valued at $688; and 72 cases, or 3,456 pounds, canned, valued at $576. The total production of both species was 87,530 pounds, valued at $7,202, as compared with 98,246 pounds valued at $12,084 in 1930—a decrease of about 11 per cent in quantity and 40 per cent in value.

## MISCELLANEOUS FISHERY PRODUCTS

Several species of fish of minor commercial importance are taken in small quantities, chiefly in connection with the halibut fishery, and are landed at ports of Alaska and British Columbia and at Seattle. Such products landed in Alaska in 1931 were as follows: Sablefish, 1,110 pounds fresh, valued at $30, and 278,235 pounds frozen, valued at $13,256; rockfishes, 4,451 pounds fresh, valued at $134, and 18,468 pounds frozen, valued at $543; flounders, 210,000 pounds fresh, valued at $5,250, and 65,172 pounds frozen, valued at $1,637; "ling-cod," 526 pounds frozen, valued at $16; and smelt, 1,340 pounds fresh, valued at $80. Most of the flounders were used in Alaska for mink feed. The smelt production shown herein was reported from central Alaska, and the remaining products from southeastern Alaska.

# FUR-SEAL INDUSTRY

## PRIBILOF ISLANDS

### GENERAL ADMINISTRATIVE WORK

The steady growth of the Pribilof Islands fur-seal herd under Government management has brought about a gradual expansion of the bureau's work at the islands, the general plan of which is being continued along established lines. In 1931 there were taken 49,524 fur-seal skins, an increase of 7,024 over the take in the previous year. Foxing operations on St. Paul and St. George Islands were carried on as usual, and in the 1931–32 season 1,426 pelts were obtained, the largest take recorded in over 40 years.

Progress was made in the construction of additional buildings and the extension of improved roads to facilitate the taking of sealskins and their preparation for shipment. Equipment for the new by-products plant was installed, but it was not ready for operation during the sealing season, and it is probable that the depressed market on oils may prevent any profitable utilization of the fur-seal carcasses for some time to come. Meanwhile, investigations are being made to determine the practicability of using fur-seal oil as fuel for Diesel engines.

The Navy Department again detailed a vessel, the U. S. S. *Vega*, to transport the general supplies for the Pribilof Islands and to bring out the shipment of sealskins on the return trip to Seattle. Assistance was rendered also by the U. S. Coast Guard, which maintained an effective patrol for the protection of the fur seals, both in the vicinity of the islands and while the animals were on their northward migration. The cooperation of these branches of the Government is of very material assistance to the bureau in the administration of the fur-seal activities.

The Canadian and Japanese Governments continued having their shares of Pribilof Islands sealskins sold by the United States, receiving payment in money rather than the actual delivery of skins. The United States share of fur-seal skins taken by the Japanese Government in 1931 was received at St. Louis in February, 1932.

Commissioner O'Malley visited the Pribilof Islands in July to observe sealing operations. Among those who accompanied him on this trip was P. B. Fouke, president of the Fouke Fur Co., contractors for finishing and selling the Government fur-seal and fox skins taken at the islands.

### TRANSPORTATION OF SUPPLIES

The U. S. S. *Vega* transported the general supplies required for the Pribilof Islands. The vessel left Seattle on July 24 and arrived at the islands on August 2. Cargo consisted of approximately 997 tons of general supplies, 1,322 tons of coal, 255,000 board feet of lumber, and 52,000 shingles. The *Vega* left the islands on August 17 with 49,425 fur-seal skins, some miscellaneous freight, and six passengers, arriving at Seattle August 24.

During the year a number of minor shipments of supplies were forwarded to the Pribilof Islands from Seattle on the *Penguin* on the following dates: April 7, June 1, September 2, and October 12. The September shipment included 31 tons of freight which was taken

aboard at Seward on July 28 and which consisted of equipment transferred to the bureau from the Alaska Railroad.

### POWER VESSEL "PENGUIN"

At the beginning of the year the *Penguin* was stationed at its headquarters at Unalaska, whence a trip was made to the Pribilofs on January 7 with passengers, mail, and cargo. The weather was exceptionally fine throughout the trip, greatly expediting the discharge of freight at both islands. On the return trip on January 10 three bureau employees were passengers to Unalaska, proceeding thence on a mail boat to Seattle. The *Penguin* sailed again for the Pribilofs on February 21 with mail and general cargo and returned to Unalaska on February 24.

On the following day the *Penguin* departed for Seattle via Seward, having as passengers a school teacher from St. Paul Island to Seattle and an employee of the Department of Justice and his wife from Unalaska to Seward. Stormy weather en route necessitated taking shelter at Port Graham, Cook Inlet, until conditions improved. The two passengers for Seward were discharged there on March 2, and on March 11 the vessel reached Seattle.

The *Penguin* sailed on April 7 for the Pribilofs via Ketchikan, Petersburg, Perryville, Squaw Harbor, and Unalaska with a capacity load of freight and 16 passengers, of whom 15 were bureau employees and 1 was an employee of the Department of Justice stationed at Unalaska. Seven natives were transferred from Perryville to St. Paul Island. After landing the passengers and cargo and performing some interisland work the vessel proceeded to Unalaska, arriving there on April 25. On April 28, 43 natives were transported to St. Paul Island from Makushin, Akutan, and Unalaska. One bureau employee and four persons from the naval radio station at St. Paul Island took passage on the *Penguin* on May 1 for Seattle; and six passengers were taken aboard at Unalaska on May 3, of whom two went as far as Seward and the others to Seattle, which was reached on May 13. The vessel carried also miscellaneous freight and the season's take of fox skins, consisting of 889 blue and 26 white pelts consigned to St. Louis.

Carrying three members of the bureau's staff, 22 Fouke Fur Co. employees to assist with sealing operations, and a cargo of general supplies, the *Penguin* sailed for the Pribilofs on June 1, reaching the islands on June 11. After attending to interisland transportation the vessel sailed for Seattle on the following day and arrived there on June 20.

From June 28 to August 20 the *Penguin* was used by the Commissioner of Fisheries on a trip of general inspection of the fishery and fur-seal activities. Stops were made at various points in southeastern, central, and western Alaska, and the vessel was at the Pribilof Islands from July 16 to 18, inclusive. While the *Penguin* was on this detail, the fisheries patrol vessel *Crane* served as tender for the islands.

Another round trip between Seattle and the Pribilofs was made by the *Penguin* from September 2 to September 25. Interisland duties were performed during this trip, including the transportation of 18 natives from St. Paul Island to St. George Island. Six natives were

transferred from St. Paul Island to Unalaska, and three bureau employees and one native were taken to Seattle.

The *Penguin* left Seattle for the Pribilofs on October 12, carrying a full cargo and two natives. St. George Island was reached on October 28 after a very stormy passage which necessitated a number of stops en route. At Unalaska 9 passengers were taken aboard for transfer to St. Paul Island. Of these, 3 were connected with the naval radio station at the island and 6 were natives. The vessel left for Seattle on October 30 and stopped en route at a number of villages along the Alaska Peninsula to return native workmen to their homes. Seventeen employees of the bureau at the islands were returned to Seattle, and Warden Charles Petry and 2 others were picked up at Seward for transportation to the States. The vessel reached its destination on November 15 and was moored in Lake Union for the remainder of the year for minor repairs and general overhauling. During the year the *Penguin* cruised 28,550 nautical miles.

## ROADS

*St. Paul Island.*—In 1931, road construction on St. Paul Island was confined chiefly to the Big Lake and Northeast Point roads. On June 4 work was commenced in surfacing the Northeast Point road with scoria from a scoria deposit in Polovina Hill. A total of 1¼ miles of this road was surfaced during the season. It is believed that it will be possible to reach Northeast Point by truck during the sealing season of 1932. The scoria-surfaced road now extends 7 miles from the village.

The work on the Big Lake project comprised the grading of the sand dunes for a roadbed along the shores of the lake, and the laying of road lumber that had been distributed at strategic points in the previous season. A plank road 1⅞ miles long was constructed.

*St. George Island.*—In September and October considerable progress was made in the extension of the road from St. George village to North and Staraya Artil rookeries. It is the purpose ultimately to make Zapadni rookery a terminus of this road. Planks were used for surfacing, as in the previous year. A total of 5,660 feet of road has been constructed from the village toward North rookery, and of this distance 3,900 feet is surfaced with road planks.

The scoria found on St. George Island is considered too fine for road work, as it has a tendency to wash away unless mixed with gravel or rock. Therefore, for the section of the road connecting Staraya Artil rookery with Zapadni rookery the shale rock that is present in the immediate vicinity will be used for road surfacing.

## BUILDINGS

*St. Paul Island.*—The building that houses the new electrical plant was completed during the winter and machinery was installed. Considerable additional equipment is still necessary to make full use of the plant for the village lighting system.

An overhead carrying system was an improvement in the newly completed extension to the sealskin washhouse. The carriers facilitate the handling of skins during blubbering operations. The overhead system is also equipped with carriers for blubber removed from the skins. Well-lighted and draftless working rooms are provided for seal blubberers in the building. An electrically operated wringer to

extract surplus water from blubbered skins was added to the equipment in the blubbering shop.

A new pipe line was laid from the washhouse to a point offshore where water is available at all stages of the tide, and a small building was erected to house the pumping equipment. With this system there can be obtained about four times as much water as formerly in the same period of time.

The new hospital building which was started last season was completed during the winter. A new garage was erected early in the fall for trucks, tractors, and other motive equipment at the island.

In addition to the completion of the above-mentioned buildings, a great amount of work was done on the foundations of future structures. Footings were laid for an extension to the salt house to be used for barreling skins, and also for a new washhouse; and excavation was made for the foundation of a bunk house to accommodate sealing assistants from the States. Work was begun on the new Government house and community house, as well as on raising the floor of the old company house preparatory to laying new cement foundation.

Considerable time was spent on construction work and on the installation of machinery at the by-products plant at the beginning of the season, and for that reason little could be done toward completion of the wharf at East Landing which was begun in 1930.

*St. George Island.*—The new company house which was started in 1930 for the accommodation of unmarried employees and transients was completed during the winter. The erection of a new coal house and a chicken house was undertaken in the fall after the close of the sealing season.

Other construction work included the repairing and widening of the dock so that additional cargo space is now available for receiving and shipping freight.

## NATIVES

### CENSUS

The annual census, taken as of December 31, 1931, showed 232 native residents on St. Paul Island. In addition, 1 St. Paul Island native was in a Seattle hospital, and 7 were elsewhere, making a total of 240 accredited to the island. One native, formerly enrolled at the Salem Indian School, Chemawa, Oreg., is married and living in Seattle, and one who was reported as temporarily absent at the close of the year 1930 has become a permanent resident elsewhere. These two, therefore, have been dropped from the census list. One native from St. George Island was recorded as having become a permanent resident of St. Paul Island. During the year there were 13 births and 5 deaths among the natives.

On St. George Island there were 144 native residents as of December 31, 1931. One native left the island and became a permanent resident of St. Paul Island. There were five births and two deaths during the year.

The total number accredited to both islands on December 31, 1931, was 384, a net increase of nine over the figures for the previous year.

### MEDICAL SERVICES

Two physicians were stationed at the Pribilof Islands during the year to render medical aid to the native population and to Government employees and their families. A dentist for the islands arrived at St.

Paul Island on the *Penguin* on April 18 and was on duty throughout the remainder of the year. It is planned to have him continue until all needed dental work is completed.

Two natives, a woman and child, from St. Paul Island were taken to Seattle on the *Vega* in August for medical attention. The woman's case was properly cared for, and she returned to St. Paul Island on the *Penguin* in October. The child, a girl 5 years old, was placed in the Orthopedic Hospital at Seattle for treatment for tubercular hip. She is reported to be getting along satisfactorily, but it will probably be necessary for her to remain at the hospital for at least a year.

### SCHOOLS

The bureau maintains schools for the native children on St. Paul and St. George Islands, two teachers being employed on each island.

*St. Paul Island.*—The 1930–31 school year began September 2, 1930, and closed April 30, 1931. There were 16 boys and 17 girls enrolled in the junior and 14 boys and 19 girls in the senior school, a total of 66 pupils.

*St. George Island.*—The school opened on September 2, 1930, and closed May 29, 1931. In the junior school 18 pupils were enrolled and in the senior school 20, a total of 38 pupils.

### SAVINGS ACCOUNTS

As in previous years, the Commissioner of Fisheries had in his custody certain funds of a number of the Pribilof Island natives. He also held funds belonging to the native church on St. Paul Island. These funds were kept on deposit in the Washington Loan & Trust Co., Washington, D. C. The rate of interest was reduced twice during the year—on April 1 from 3 to 2½ per cent and on July 1 to 2 per cent. Interest was calculated on monthly balances and credited semiannually. One account was closed during the year. A summary of the accounts as a whole for the year 1931 is shown in the statement that follows:

| | |
|---|---|
| On hand, Jan. 1, 1931 | $8, 627. 90 |
| Interest earned from Jan. 1 to Dec. 31, 1931 | 201. 76 |
| | 8, 829. 66 |
| Withdrawn by natives | 263. 01 |
| On hand, Dec. 31, 1931 | 8, 566. 65 |

An itemized statement of the funds, showing the individual accounts follows:

*Funds of the Pribilof Islands natives and the St. Paul Island native church in the custody of the United States Commissioner of Fisheries, as trustee, December 31, 1931*

| | | | |
|---|---|---|---|
| Fratis, Iuliania [1] | $127. 98 | Merculief, Erena | $666. 48 |
| Gromoff, Iuliania | 350. 95 | Merculief, George | 145. 33 |
| Kochutin, Alexandra | 3, 796. 20 | Merculief, jr., George | 63. 18 |
| Kozloff, Marina (Shane) | 117. 91 | Merculief, Tatiana | 666. 48 |
| Kozloff, Raisa | 110. 63 | Pankoff, Agrippina | 180. 74 |
| Krukoff, Martha (Bourdukofsky) | 82. 96 | St. Paul Island native church | 972. 14 |
| Lekanof, Sophia M | 81. 84 | Sedick, Lavrenty | 131. 97 |
| Lestenkof, Michael | 372. 95 | | |
| Merculief, Alexandra | 176. 21 | Total | 8, 566. 65 |
| Merculief, Daniel | 522. 70 | | |

[1] Not living on Pribilof Islands in 1931.

PAYMENTS FOR TAKING FUR-SEAL SKINS

For their work in connection with the taking, curing, and shipping of fur-seal skins the resident natives of the Pribilof Islands are paid cash at a flat rate of 75 cents for each sealskin taken. The payments are distributed among the men and boys taking part in the work in accordance with the rated ability and skill of each. The persons entitled to this compensation are divided into classes, the individuals in each class receiving equal amounts. In addition, small bonuses in cash are allowed for special work in connection with the sealing operations. Payments were made as shown below.

*St. Paul Island.*—For the 39,964 skins taken on St. Paul Island the sum of $29,973 was paid and in addition a total of $100 was allowed two foremen for special services, $50 for a cook, and $140 for seven mess attendants. A statement of the earnings follows:

*Payments to St. Paul Island natives for taking fur-seal skins, calendar year 1931*

| Classification | Number of men | Share of each | Total | Classification | Number of men | Share of each | Total |
|---|---|---|---|---|---|---|---|
| First class | 34 | $606.75 | $20,629.50 | Foreman (additional compensation) | | | $40.00 |
| Second class | 10 | 506.25 | 5,062.50 | Cook | | | 50.00 |
| Third class | 6 | 384.00 | 2,304.00 | Mess attendants, 7, @ $20 each | | | 140.00 |
| Fourth class | 5 | 325.50 | 1,627.50 | Total | | | 30,263.00 |
| Fifth class | 6 | 53.25 | 319.50 | | | | |
| Boys' class | 1 | 30.00 | 30.00 | | | | |
| Foreman (additional compensation) | | | 60.00 | | | | |

*St. George Island.*—For the 9,560 sealskins taken on St. George Island the sum of $7,170 was paid and in addition a total of $100 was allowed two foremen for special services. A statement of the earnings follows:

*Payments to St. George Island natives for taking fur-seal skins, calendar year 1931*

| Classification | Number of men | Share of each | Total | Classification | Number of men | Share of each | Total |
|---|---|---|---|---|---|---|---|
| First class | 23 | $219.00 | $5,037.00 | Foreman (additional compensation) | | | $55.00 |
| Second class | 7 | 174.00 | 1,218.00 | Do | | | 45.00 |
| Third class | 5 | 135.00 | 675.00 | Total | | | 7,270.00 |
| Fourth class | 2 | 93.75 | 187.50 | | | | |
| Fifth class | 2 | 21.00 | 42.00 | | | | |
| Boys' class | 1 | 10.50 | 10.50 | | | | |

PAYMENTS FOR TAKING FOX SKINS

The natives are paid $5 in cash for each fox skin taken on the Pribilof Islands. For the season of 1930–31 these payments amounted to $1,175 for the 235 skins taken on St. Paul Island and $3,400 for the 680 taken on St. George Island, a total of $4,575.

## FUR SEALS

### QUOTAS FOR KILLING AND RESERVING

Plans for sealing operations in 1931, as approved by the Department of Commerce, provided for the marking of a breeding reserve of about five thousand 3-year-old male fur seals, divided between St. Paul Island and St. George Island in approximately the ratio of 4 to 1, and the killing of as many of the remaining males of this age as could be secured in the regular sealing periods. Provision was made for increasing the reserve if counts of the idle and harem bulls in the breeding season indicated the advisability of such action. As some of the 3-year-old males are never taken up in the drives the number of animals remaining for the reserve is always greater than the number marked.

### KILLINGS

In 1931, 49,524 fur seals were killed, of which 39,964 were taken on St. Paul Island and 9,560 on St. George Island. Details in regard to the killings are shown in the following tabulations:

*Seal killings on Pribilof Islands in 1931*

ST. PAUL ISLAND

| Date | Serial No. of drive | Hauling ground | Skins secured |
|---|---|---|---|
| June 8 | 1 | Sea Lion Rock (Sivutch) | 88 |
| 11 | 2 | Reef and Gorbatch | 113 |
| 16 | 3 | Tolstoi | 119 |
| 17 | 4 | Zapadni | 68 |
| 19 | 5 | Reef and Gorbatch | 296 |
| 20 | 6 | Polovina and Little Polovina | 127 |
| 21 | 7 | Vostochni and Morjovi | 688 |
| 22 | 8 | Tolstoi, Lukanin, and Kitovi | 165 |
| 23 | 9 | Zapadni and Little Zapadni | 433 |
| 24 | 10 | Reef and Gorbatch | 1,456 |
| 25 | 11 | Polovina and Little Polovina | 124 |
| 26 | 12 | Vostochni and Morjovi | 1,041 |
| 27 | 13 | Tolstoi, Lukanin, and Kitovi | 451 |
| 28 | 14 | Zapadni and Little Zapadni | 807 |
| 29 | 15 | Reef and Gorbatch | 2,040 |
| 30 | 16 | Polovina and Little Polovina | 207 |
| July 1 | 17 | Vostochni and Morjovi | 1,090 |
| 2 | 18 | Tolstoi, Lukanin, and Kitovi | 525 |
| 3 | 19 | Zapadni and Little Zapadni | 996 |
| 5 | 20 | Reef and Gorbatch | 2,167 |
| 6 | 21 | Polovina and Little Polovina | 645 |
| 7 | 22 | Vostochni and Morjovi | 1,552 |
| 8 | 23 | Tolstoi, Lukanin, and Kitovi | 921 |
| 9 | 24 | Zapadni and Little Zapadni | 1,993 |
| 10 | 25 | Reef and Gorbatch | 2,407 |
| 11 | 26 | Polovina and Little Polovina | 670 |
| 12 | 27 | Vostochni and Morjovi | 1,942 |
| 13 | 28 | Tolstoi, Lukanin, and Kitovi | 1,020 |
| 14 | 29 | Zapadni and Little Zapadni | 1,538 |
| 15 | 30 | Reef and Gorbatch | 3,178 |
| 16 | 31 | Polovina and Little Polovina | 236 |
| 17 | 32 | Tolstoi, Lukanin, and Kitovi | 752 |
| 18 | 33 | Vostochni and Morjovi | 2,292 |
| 19 | 34 | Zapadni and Little Zapadni | 940 |
| 20 | 35 | Reef and Gorbatch | 1,907 |
| 21 | 36 | Polovina and Little Polovina | 708 |
| 22 | 37 | Vostochni and Morjovi | 1,170 |
| 23 | 38 | Tolstoi, Lukanin, and Kitovi | 599 |
| 24 | 39 | Zapadni and Little Zapadni | 637 |
| 25 | 40 | Reef and Gorbatch | 1,429 |
| 26 | 41 | Polovina and Little Polovina | 420 |
| 29-30 | ..... | Skins from seals that died as a result of reserving operations | 7 |
| | | Total | 39,964 |

*Seal killings on Pribilof Islands in 1931*—Continued

ST. GEORGE ISLAND

| Date | Serial No. of drive | Hauling ground | Skins secured |
|---|---|---|---|
| June 8 | 1 | North and East | 20 |
| 13 | 2 | East | 51 |
| 15 | 3 | North and Staraya Artil | 54 |
| 19 | 4 | North | 69 |
| 21 | 5 | East | 59 |
| 23 | 6 | North and Staraya Artil | 148 |
| 24 | 7 | Zapadni | 61 |
| 25 | 8 | East | 90 |
| 27 | 9 | North and Staraya Artil | 240 |
| 28 | 10 | Zapadni | 226 |
| 29 | 11 | East | 304 |
| July 1 | 12 | North and Staraya Artil | 431 |
| 2 | 13 | Zapadni | 231 |
| 3 | 14 | East | 308 |
| 5 | 15 | North and Staraya Artil | 539 |
| 6 | 16 | Zapadni | 110 |
| 7 | 17 | East | 337 |
| 9 | 18 | North and Staraya Artil | 422 |
| 10 | 19 | Zapadni | 285 |
| 11 | 20 | East | 813 |
| 13 | 21 | North and Staraya Artil | 861 |
| 14 | 22 | Zapadni | 114 |
| 15 | 23 | East | 766 |
| 17 | 24 | North and Staraya Artil | 948 |
| 18 | 25 | Zapadni | 130 |
| 19 | 26 | East | 365 |
| 21 | 27 | North and Staraya Artil | 417 |
| 22 | 28 | Zapadni | 75 |
| 23 | 29 | East | 624 |
| 25 | 30 | North and Staraya Artil | 461 |
| 28 | ..... | Skin from seal that died as a result of reserving operations | 1 |
| | | Total | 9,560 |

AGE CLASSES

The age class of a male seal belonging to the Pribilof Islands herd is determined from the length of its body. The classification was derived from the measurements of a large number of pups branded in 1912 and killed in subsequent years. The limits of the various age classes are shown in the table following:

*Age classes of male seals, Pribilof Islands*

| Age | Length of summer seals (inches) | Length of fall seals (inches) | Age | Length of summer seals (inches) | Length of fall seals (inches) |
|---|---|---|---|---|---|
| Yearlings | Up to 36.75 | Up to 38.75 | 4-year-olds | 46 to 51.75 | 48 to 53.75 |
| 2-year-olds | 37 to 40.75 | 39 to 42.75 | 5-year-olds | 52 to 57.75 | 54 to 59.75 |
| 3-year-olds | 41 to 45.75 | 43 to 47.75 | 6-year-olds | 58 to 63.75 | 60 to 65.75 |

*Ages of seals killed on Pribilof Islands, calendar year 1931*

[On basis of classification shown in preceding table]

| Age | St. Paul Island | St. George Island | Total | Age | St. Paul Island | St. George Island | Total |
|---|---|---|---|---|---|---|---|
| Yearling males | 12 | ..... | 12 | 5-year-old males | 1 | 1 | 2 |
| 2-year-old males | 1,064 | 199 | 1,263 | Cows [1] | 44 | 18 | 62 |
| 3-year-old males | 38,559 | 9,208 | 47,767 | | | | |
| 4-year-old males | 284 | 134 | 418 | Total | 39,964 | 9,560 | 49,524 |

[1] Cows unavoidably and accidentally killed or found dead.

It should be stated that some of the seals recorded in the above tabulation as 2-year-olds or 4-year-olds probably were 3-year-olds. Not all the male seals of a given age fall within the length limits assigned for the males of that age. As far as possible, the killings in 1931 were confined to 3-year-old males.

### RESERVING OPERATIONS

The annual provision for future breeding stock was made in 1931 by reserving from killing an adequate number of 3-year-old male fur seals. On St. Paul Island 3,570 animals and on St. George Island 1,656 were marked by shearing a patch of fur from the head. Details in regard to the marking operations are as follows:

*Marking of 3-year-old male fur seals for breeding reserve, Pribilof Islands, 1931*

ST. PAUL ISLAND

| Date | Hauling ground driven | Number seals marked | Date | Hauling ground driven | Number seals marked |
|---|---|---|---|---|---|
| July 27 | Vostochni and Morjovi | 775 | July 31 | Zapadni and Little Zapadni | 578 |
| 28 | Tolstol, Lukanin, and Kitovi | 581 | | Total | 3,570 |
| 29 | Gorbatch | 956 | | | |
| 30 | Reef | 680 | | | |

ST. GEORGE ISLAND

| | | | | | |
|---|---|---|---|---|---|
| July 26 | Zapadni | 196 | July 30 | North | 647 |
| 27 | East | 597 | | Total | 1,656 |
| 28 | Staraya Artil | 216 | | | |

### COMPUTATION OF FUR-SEAL HERD

The computation of the size of the fur-seal herd in 1931 was again made by Supt. H. J. Christoffers, who was assisted by R. B. Payne, A. Christoffersen, and Lee C. McMillin. As of August 10 the total of all classes was 1,127,082—a numerical increase of 81,981 and a percentage increase of 7.84 over the figures for the preceding year. The detailed report will be found on pages 89 to 96 of this document. Following is a comparative statement of the numerical strength of the various elements of the fur-seal herd in the years 1920 to 1931, inclusive:

*General comparison of computations of the seal herd on the Pribilof Islands, 1920 to 1931*

| Classes | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|---|
| Harem bulls | 4,066 | 3,909 | 3,562 | 3,412 | 3,516 | 3,526 |
| Breeding cows | 167,527 | 176,655 | 185,914 | 197,659 | 208,396 | 226,090 |
| Surplus bulls | 6,115 | 3,301 | 2,346 | 1,891 | 2,043 | 3,558 |
| Idle bulls | 1,161 | 747 | 508 | 312 | 390 | 311 |
| 6-year-old males | 4,153 | 3,991 | 3,771 | 4,863 | 8,489 | 4,105 |
| 5-year-old males | 5,007 | 4,729 | 6,080 | 10,612 | 5,132 | 16,792 |
| 4-year-old males | 5,667 | 6,780 | 11,807 | 5,710 | 18,670 | 18,692 |
| 3-year-old males | 10,749 | 14,668 | 7,459 | 22,786 | 21,551 | 21,185 |
| 2-year-old males | 39,111 | 41,893 | 40,920 | 43,112 | 45,085 | 43,515 |
| Yearling males | 51,074 | 50,249 | 52,988 | 55,769 | 59,291 | 52,091 |
| 2-year-old cows | 39,480 | 43,419 | 46,280 | 48,801 | 51,359 | 49,786 |
| Yearling cows | 51,081 | 54,447 | 57,413 | 60,422 | 64,240 | 57,309 |
| Pups | 167,527 | 176,655 | 185,914 | 197,659 | 208,396 | 226,090 |
| Total | 552,718 | 581,443 | 604,962 | 653,008 | 697,158 | 723,050 |

*General comparison of computations of the seal herd on the Pribilof Islands, 1920 to 1931*—Continued

| Classes | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 |
|---|---|---|---|---|---|---|
| Harem bulls | 4,034 | 4,643 | 6,050 | 7,187 | 8,312 | 9,233 |
| Breeding cows | 244,114 | 263,566 | 284,725 | 307,491 | 332,084 | 358,642 |
| Surplus bulls | 2,002 | 4,827 | 5,285 | 5,207 | 3,963 | 3,291 |
| Idle bulls | 423 | 972 | 1,449 | 1,633 | 1,899 | 1,888 |
| 6-year-old males | 13,434 | 13,450 | 12,857 | 10,399 | 5,612 | 6,553 |
| 5-year-old males | 16,812 | 16,073 | 13,001 | 7,016 | 8,191 | 10,193 |
| 4-year-old males | 17,872 | 14,448 | 7,798 | 9,102 | 11,327 | 12,966 |
| 3-year-old males | 17,189 | 9,730 | 11,133 | 13,639 | 14,871 | 13,198 |
| 2-year-old males | 38,183 | 41,252 | 49,087 | 64,354 | 69,674 | 74,828 |
| Yearling males | 56,514 | 61,026 | 65,861 | 85,381 | 92,232 | 99,612 |
| 2-year-old cows | 44,415 | 48,186 | 57,061 | 67,210 | 72,605 | 78,410 |
| Yearling cows | 62,175 | 67,131 | 72,481 | 85,417 | 92,247 | 99,626 |
| Pups | 244,114 | 263,566 | 284,725 | 307,491 | 332,084 | 358,642 |
| Total | 761,281 | 808,870 | 871,513 | 971,527 | 1,045,101 | 1,127,082 |

## FOXES

The care of blue-fox herds on St. Paul and St. George Islands is incidental to the fur-seal work, requiring attention at a time when sealing activities are at a minimum. Throughout the summer the foxes find an abundance of natural food, consisting of seal carcasses, birds' eggs, and marine life along the beaches. In the winter, when the natural food supply is inadequate, the animals are fed preserved seal meat and specially prepared rations. Captures are made in the months from December to February, inclusive, to obtain pelts and to mark an appropriate number of animals for future breeding stock.

### TRAPPING SEASON OF 1931–32

During the season of 1931–32 there were taken 1,426 fox pelts, of which 1,401 were blue and 25 white. Two hundred and eighty-nine blue and 25 white pelts were taken on St. Paul Island, and 1,112 blue pelts on St. George Island. There were also trapped, marked, and released for breeding purposes 37 foxes on St. Paul Island and 432 on St. George Island. The breeding reserve includes, in addition, a considerable number of animals that were not captured during the season.

## REINDEER

*St. Paul Island.*—During the year ended September 30, 1931, 19 reindeer were killed and used for food. A count of the animals in the herd on September 29 showed a total of 453, of which 80 were the young of the season. The herd was apparently in excellent condition.

*St. George Island.*—Five reindeer were killed and used for food during the year ended September 30, 1931. A count made on September 22 showed 47 animals in the herd, of which 5 were the young of the season.

## FUR-SEAL SKINS

### SHIPMENTS

Shipment of fur-seal skins taken on the Pribilof Islands in the calendar year 1931 was made on the U. S. S. *Vega*, which arrived at Seattle, Wash., on August 24. This shipment consisted of 39,871 skins taken on St. Paul Island and 9,554 taken on St. George Island, a total

of 49,425. In all probability there were actually shipped from St. George Island 9,560 skins, the total number taken there in 1931, as it is believed that a miscount was made in packing the skins and that the error will be rectified when they are unpacked. The shipment was forwarded from Seattle by freight on August 25 and was delivered to the department's selling agents at St. Louis, Mo., on September 2.

One barrel containing 93 skins, inadvertently omitted from the shipment at St. Paul Island, was forwarded later on the *Penguin*, reaching Seattle on September 26, whence it was forwarded to St. Louis by express.

SALES

In 1931 a total of 45,711 fur-seal skins taken on the Pribilof Islands were sold at three public auction sales held at St. Louis. There were also sold through special sales 271 fur-seal skins taken at those islands. With the following statements of these sales the sales of other fur-seal skins by the Department of Commerce for the account of the Government are included in order that the records may be complete.

*Public auction sale, March 30, 1931.*—At the spring sale 21,071 fur-seal skins taken at the Pribilof Islands, dressed, dyed, and machined, sold for $453,699.75. Of these skins, 11,503 were dyed black and 9,568 logwood brown (Bois de Campêche). There were also sold 137 dressed, dyed, and machined Japanese fur-seal skins for $3,155.50; 33 raw-salted Japanese skins for $16.50; and 2 raw-salted confiscated skins for $1, making a grand total of $456,872.75 for fur-seal skins at this sale.

The Japanese fur-seal skins were the United States Government's share of such skins taken by the Japanese Government in 1929, delivered pursuant to the provisions of the North Pacific Sealing Convention of July 7, 1911.

*Public auction sale, August 24, 1931.*—At the August sale 15,125 fur-seal skins taken at the Pribilof Islands, dressed, dyed, and machined, sold for $282,642.75. Of these skins, 9,125 were dyed black and 6,000 logwood brown.

*Public auction sale, October 19, 1931.*—At the October sale 9,515 fur-seal skins taken at the Pribilof Islands, dressed, dyed, and machined, sold for $153,938.50. Of these skins 5,535 were dyed black and 3,980 logwood brown. There were also sold 32 confiscated skins, raw, for $15.25, making a total of $153,953.75 for fur-seal skins at this sale.

*Special sales.*—In the calender year 1931, 271 fur-seal skins taken at the Pribilof Islands were sold at special sales for $6,915.16. Of these skins, 200 were dressed, dyed, and machined, 75 being of the black dye and 125 logwood brown; 61 were raw salted; and 10 were specially prepared for exhibition purposes showing (1) a section of the pelt in the natural hair, (2) a section unhaired with the fur in natural color, (3) a section with the fur dyed black, and (4) a section with the fur dyed logwood brown. The dyed skins included 150 that were sent to Paris and made up into coats, which were returned to this country and used for advertising.

The following tables give further details in regard to the sales of fur-seal skins by the Department of Commerce for the account of the Government in 1931:

*Comparative values, by sizes and grades, with percentages each size, of Pribilof sealskins sold at public auction in 1931*

| Classes and sales | Grade | Number | High | Low | Average | Total | Total number | Average price | Total price | Percentage |
|---|---|---|---|---|---|---|---|---|---|---|
| DYED BLACK | | | | | | | | | | |
| Extra extra large: | | | | | | | | | | |
| Mar. 30 | I and II | 14 | $45.50 | $45.50 | $45.50 | $637.00 | 42 | $32.39 | $1,360.50 | 0.37 |
| | Scarred, faulty, etc | 28 | 26.00 | 24.50 | 25.84 | 723.50 | | | | |
| Extra large: | | | | | | | | | | |
| Mar. 30 | I and II | 283 | 45.50 | 35.00 | 44.60 | 12,623.00 | 742 | 32.10 | 23,818.50 | 6.45 |
| | Scarred, faulty, etc | 453 | 26.00 | 23.50 | 24.60 | 11,146.00 | | | | |
| | III | 6 | 8.25 | 8.25 | 8.25 | 49.50 | | | | |
| Aug. 24 | I and II | 120 | 34.50 | 34.00 | 34.25 | 4,110.00 | 247 | 28.99 | 7,160.50 | 2.71 |
| | Scarred, faulty, etc | 120 | 25.00 | 24.50 | 24.75 | 2,970.00 | | | | |
| | III | 7 | 11.50 | 11.50 | 11.50 | 80.50 | | | | |
| Oct. 19 | I and II | 55 | 25.50 | 22.00 | 25.18 | 1,385.00 | 122 | 20.35 | 2,482.25 | 2.21 |
| | Scarred, faulty, etc | 60 | 17.50 | 17.50 | 17.50 | 1,050.00 | | | | |
| | III | 7 | 6.75 | 6.75 | 6.75 | 47.25 | | | | |
| Large: | | | | | | | | | | |
| Mar. 30 | I and II | 1,868 | 37.50 | 31.00 | 33.04 | 61,722.50 | 4,123 | 28.13 | 115,970.50 | 35.84 |
| | Scarred, faulty, etc | 2,223 | 26.50 | 21.50 | 24.28 | 53,984.00 | | | | |
| | III | 32 | 8.25 | 8.25 | 8.25 | 264.00 | | | | |
| Aug. 24 | I and II | 1,380 | 27.50 | 20.00 | 24.30 | 33,532.50 | 2,958 | 20.73 | 61,309.50 | 32.41 |
| | Scarred, faulty, etc | 1,520 | 19.00 | 17.00 | 17.84 | 27,110.00 | | | | |
| | III | 58 | 11.50 | 11.50 | 11.50 | 667.00 | | | | |
| Oct. 19 | I and II | 660 | 22.00 | 18.50 | 20.36 | 13,435.00 | 1,613 | 18.22 | 29,396.50 | 29.14 |
| | Scarred, faulty, etc | 910 | 18.75 | 15.50 | 17.22 | 15,671.25 | | | | |
| | III | 43 | 6.75 | 6.75 | 6.75 | 290.25 | | | | |
| Medium: | | | | | | | | | | |
| Mar. 30 | I and II | 2,330 | 26.50 | 23.00 | 25.18 | 58,680.00 | 6,186 | 21.36 | 132,122.25 | 53.78 |
| | Scarred, faulty, etc | 3,707 | 21.75 | 17.00 | 19.54 | 72,425.50 | | | | |
| | III | 149 | 7.75 | 5.75 | 6.82 | 1,016.75 | | | | |
| Aug. 24 | I and II | 2,600 | 22.00 | 19.00 | 20.70 | 53,820.00 | 5,380 | 18.77 | 101,005.00 | 58.96 |
| | Scarred, faulty, etc | 2,680 | 18.50 | 15.75 | 17.26 | 46,260.00 | | | | |
| | III | 100 | 9.50 | 9.00 | 9.25 | 925.00 | | | | |
| Oct. 19 | I and II | 1,375 | 19.00 | 17.75 | 18.23 | 25,065.00 | 3,445 | 16.63 | 57,307.50 | 62.24 |
| | Scarred, faulty, etc | 1,960 | 16.75 | 15.00 | 16.09 | 31,530.00 | | | | |
| | III | 110 | 6.75 | 6.25 | 6.48 | 712.50 | | | | |
| Small medium: | | | | | | | | | | |
| Mar. 30 | I and II | 120 | 18.25 | 18.00 | 18.17 | 2,180.00 | 410 | 14.51 | 5,948.75 | 3.56 |
| | Scarred, faulty, etc | 263 | 14.50 | 13.00 | 13.74 | 3,613.50 | | | | |
| | III | 27 | 5.75 | 5.75 | 5.75 | 155.25 | | | | |
| Aug. 24 | I and II | 270 | 18.25 | 18.00 | 18.08 | 4,882.50 | 540 | 16.54 | 8,932.50 | 5.92 |
| | Scarred, faulty, etc | 270 | 15.50 | 14.50 | 15.00 | 4,050.00 | | | | |
| Oct. 19 | I and II | 175 | 16.50 | 16.00 | 16.11 | 2,820.00 | 355 | 13.96 | 4,957.50 | 6.41 |
| | Scarred, faulty, etc | 150 | 13.25 | 13.00 | 13.10 | 1,965.00 | | | | |
| | III | 30 | 5.75 | 5.75 | 5.75 | 172.50 | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| All classes: | | | | | | | | | | |
| Mar. 30 | | | | | | | 11,503 | 24.27 | 279,220.50 | 100.00 |
| Aug. 24 | | | | | | | 9,125 | 19.55 | 178,407.50 | 100.00 |
| Oct. 19 | | | | | | | 5,535 | 17.01 | 94,143.75 | 100.00 |
| DYED LOGWOOD BROWN | | | | | | | | | | |
| Extra extra large: | | | | | | | | | | |
| Mar. 30 | I and II | 5 | 45.00 | 40.50 | 43.20 | 216.00 | 24 | 28.50 | 684.00 | 0.25 |
| | Scarred, faulty, etc. | 18 | 25.50 | 25.50 | 25.50 | 459.00 | | | | |
| | III | 1 | 9.00 | 9.00 | 9.00 | 9.00 | | | | |
| Extra large: | | | | | | | | | | |
| Mar. 30 | I and II | 81 | 45.00 | 31.50 | 41.56 | 3,366.00 | 256 | 28.13 | 7,201.00 | 2.68 |
| | Scarred, faulty, etc. | 154 | 25.50 | 13.50 | 23.68 | 3,646.00 | | | | |
| | III | 21 | 9.00 | 9.00 | 9.00 | 189.00 | | | | |
| Aug. 24 | I and II | 80 | 32.50 | 21.00 | 28.54 | 2,283.00 | 194 | 23.78 | 4,614.00 | 3.23 |
| | Scarred, faulty, etc. | 110 | 21.50 | 20.50 | 20.95 | 2,305.00 | | | | |
| | III | 4 | 6.75 | 6.25 | 6.50 | 26.00 | | | | |
| Oct. 19 | I and II | 1 | 18.00 | 18.00 | 18.00 | 18.00 | 1 | 18.00 | 18.00 | .02 |
| Large: | | | | | | | | | | |
| Mar. 30 | I and II | 911 | 31.50 | 29.00 | 30.07 | 27,396.50 | 2,102 | 23.79 | 50,015.50 | 21.97 |
| | Scarred, faulty, etc. | 1,074 | 25.50 | 13.50 | 20.20 | 21,692.00 | | | | |
| | III | 117 | 9.00 | 4.50 | 7.92 | 927.00 | | | | |
| Aug. 24 | I and II | 730 | 25.50 | 21.00 | 23.92 | 17,460.75 | 1,556 | 20.65 | 32,126.50 | 25.93 |
| | Scarred, faulty, etc. | 805 | 18.50 | 17.00 | 18.04 | 14,525.00 | | | | |
| | III | 21 | 6.75 | 6.25 | 6.70 | 140.75 | | | | |
| Oct. 19 | I and II | 211 | 21.25 | 18.00 | 20.43 | 4,310.00 | 694 | 17.45 | 12,110.25 | 17.44 |
| | Scarred, faulty, etc. | 483 | 17.00 | 15.75 | 16.15 | 7,800.25 | | | | |
| Medium: | | | | | | | | | | |
| Mar. 30 | I and II | 2,690 | 22.00 | 14.00 | 21.05 | 56,621.50 | 5,943 | 17.21 | 102,251.00 | 62.11 |
| | Scarred, faulty, etc. | 3,013 | 16.25 | 13.50 | 14.81 | 44,631.00 | | | | |
| | III | 240 | 4.75 | 3.50 | 4.16 | 998.50 | | | | |
| Aug. 24 | I and II | 1,655 | 18.75 | 17.75 | 18.06 | 29,887.50 | 3,710 | 16.37 | 60,733.25 | 61.84 |
| | Scarred, faulty, etc. | 1,920 | 15.75 | 14.50 | 15.55 | 29,850.00 | | | | |
| | III | 135 | 8.00 | 6.25 | 7.38 | 995.75 | | | | |
| Oct. 19 | I and II | 1,148 | 20.00 | 13.25 | 17.28 | 19,838.00 | 2,530 | 15.19 | 38,435.50 | 63.57 |
| | Scarred, faulty, etc. | 1,295 | 15.00 | 10.50 | 14.07 | 18,217.50 | | | | |
| | III | 87 | 5.00 | 3.75 | 4.37 | 380.00 | | | | |
| Small medium: | | | | | | | | | | |
| Mar. 30 | I and II | 561 | 14.75 | 13.50 | 14.04 | 7,878.25 | 1,243 | 11.53 | 14,327.75 | 12.99 |
| | Scarred, faulty, etc. | 638 | 10.50 | 8.50 | 9.79 | 6,243.75 | | | | |
| | III | 44 | 4.75 | 4.50 | 4.68 | 205.75 | | | | |
| Aug. 24 | I and II | 150 | 15.25 | 14.75 | 14.95 | 2,242.50 | 540 | 12.52 | 6,761.50 | 9.00 |
| | Scarred, faulty, etc. | 322 | 13.00 | 12.50 | 12.76 | 4,108.00 | | | | |
| | III | 68 | 7.75 | 5.75 | 6.04 | 411.00 | | | | |
| Oct. 19 | I and II | 404 | 14.50 | 13.25 | 13.80 | 5,575.50 | 755 | 12.23 | 9,231.00 | 18.97 |
| | Scarred, faulty, etc. | 351 | 10.75 | 10.00 | 10.41 | 3,655.50 | | | | |
| All classes: | | | | | | | | | | |
| Mar. 30 | | | | | | | 9,568 | 18.24 | 174,479.25 | 100.00 |
| Aug. 24 | | | | | | | 6,000 | 17.37 | 104,235.25 | 100.00 |
| Oct. 19 | | | | | | | 3,980 | 15.02 | 59,794.75 | 100.00 |

*Special sales of Pribilof Islands fur-seal skins in 1931*

| Date | Number of skins | Description | Price per skin | Total |
|---|---|---|---|---|
| Jan. 10 | 5 | 4-condition exhibition skins | $25.00 | $125.00 |
| | 5 | Raw salted (for display boards) | 11.96 | 59.80 |
| Feb. 27 | 6 | Raw salted (for mounting) | 11.96 | 71.76 |
| Apr. 10 | 50 | Raw salted | 9.51 | 475.50 |
| May 11 | 35 | Dyed logwood brown, large | 30.07 | 1,052.45 |
| | 15 | Dyed logwood brown, medium | 21.05 | 315.75 |
| Dec. 31 | 150 | 75 dyed black and 75 dyed logwood brown; made into coats for advertising purposes | | 4,689.90 |
| | 5 | 4-condition exhibition skins | 25.00 | 125.00 |
| | 271 | | | 6,915.16 |

*Sale at St. Louis, Mo., March 30, 1931, of 170 fur-seal skins received from Japanese Government under treaty provisions*

| Number of skins | Trade classification | Price per skin | Total for lot |
|---|---|---|---|
| | DRESSED, DYED, AND MACHINED, BLACK | | |
| 31 | 6 extra extra large, 5 extra large, 18 large, 2 medium | $29.50 | $914.50 |
| 48 | 1 wig, 19 extra extra large, 28 extra large; scarred, faulty, etc | 24.00 | 1,152.00 |
| 55 | 37 large, 16 medium, 2 small medium; scarred, faulty, etc | 19.50 | 1,072.50 |
| 3 | III; 1 extra extra large, 1 extra large, 1 medium | 5.50 | 16.50 |
| 137 | | | 3,155.50 |
| 33 | Raw salted | .50 | 16.50 |
| 170 | | | 3,172.00 |

## DISPOSITION OF FUR-SEAL SKINS TAKEN AT PRIBILOF ISLANDS

On January 1, 1931, there were on hand 58,760 fur-seal skins taken at the Pribilof Islands. Of these, 58,738 were at St. Louis, Mo., and 22 at Washington. In 1931, 49,524 Pribilof skins were secured at the islands, 45,982 were disposed of, and 6 were unaccounted for, due probably to a miscount in packing that will be corrected later, leaving 62,296 on hand at December 31, 1931. The following tables show further details in regard to fur-seal skins taken on the Pribilof Islands, as well as details in regard to other Government-owned fur-seal skins under the control of the Department of Commerce.

*Summary of all fur-seal skins handled on Pribilof Islands, calendar year 1931*

| Island | Number taken | Number shipped | Unaccounted for [1] |
|---|---|---|---|
| St. Paul | 39,964 | 39,964 | |
| St. George | 9,560 | 9,554 | 6 |
| Total | 49,524 | 49,518 | 6 |

[1] When skins taken in the commercial season in 1931 were packed for shipment the count was 6 less than the number taken. It is believed that a miscount was made in packing the skins and that the error will be rectified when the skins are unpacked at St. Louis.

*Summary of all Government-owned fur-seal skins under control of Department of Commerce, calendar year 1931*

| Source | On hand Jan. 1 | | | Receipts in 1931 | Sales in 1931 | Unaccounted for [1] | On hand Dec. 31 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Fouke Fur Co. | Washington office | Total | | | | Fouke Fur Co. | Washington office | Total |
| Taken on Pribilof Islands: | | | | | | | | | |
| Calendar year 1918, held for reference purposes | | 7 | 7 | | | | | 7 | 7 |
| Calendar year 1923 | | 3 | 3 | | | | | 3 | 3 |
| Calendar year 1924 | | 1 | 1 | | | | | 1 | 1 |
| Calendar year 1929 | 16,241 | 10 | 16,251 | | 15,720 | | 526 | 5 | 531 |
| Calendar year 1930 | 42,497 | 1 | 42,498 | | 30,262 | | 12,234 | 2 | 12,236 |
| Calendar year 1931 | | | | 49,524 | | 6 | 49,518 | | 49,518 |
| Miscellaneous skins held for reference purposes | | 4 | 4 | | | | | 4 | 4 |
| United States' share of Japanese sealskins: | | | | | | | | | |
| Season of 1929 | 170 | | 170 | | 170 | | | | |
| Season of 1930 | | | | 172 | | | 172 | | 172 |
| Confiscated skins | 2 | | 2 | 63 | 34 | | 31 | | 31 |
| Total | 58,910 | 26 | 58,936 | 49,759 | 46,186 | 6 | 62,481 | 22 | 62,503 |

[1] When skins taken in the commercial season in 1931 were packed for shipment the count was 6 less than the number taken. It is believed that a miscount was made in packing the skins and that the error will be rectified when the skins are unpacked at St. Louis.

*Summary of Government-owned fur-seal skins in the custody of Fouke Fur Co., at St. Louis, Mo., calendar year 1931*

| Source | On hand Jan. 1 | Receipts in 1931 | Disposed of in 1931 | On hand Dec. 31 |
|---|---|---|---|---|
| Taken on Pribilof Islands: | | | | |
| Calendar year 1929 | 16,241 | [1] 5 | [2] 15,720 | 526 |
| Calendar year 1930 | 42,497 | | [3] 30,263 | 12,234 |
| Calendar year 1931 | | 49,518 | | 49,518 |
| United States' share of Japanese fur-seal skins: | | | | |
| Season of 1929 | 170 | | [2] 170 | |
| Season of 1930 | | 172 | | 172 |
| Confiscated fur-seal skins | 2 | 63 | [2] 34 | 31 |
| Total | 58,910 | 49,758 | 46,187 | 62,481 |

[1] Returned from Washington.
[2] Sold.
[3] 30,262 sold; 1 shipped to Washington for exhibition purposes.

## SHIPMENT AND SALE OF FOX SKINS

The 211 blue and 24 white fox skins taken on St. Paul Island in the season of 1930–31 and the 678 blue and 2 white fox skins taken on St. George Island in the same season were shipped from the islands on the *Penguin* in May, arriving at Seattle on May 13, whence they were forwarded by express to the department's selling agents at St. Louis, Mo.

At the public auction sale in St. Louis on March 30, 1931, there were sold 370 blue fox skins that remained from the take on the Pribilof Islands in the 1929–30 season. These skins sold for $14,593.50, an average of $39.44 per skin. The maximum price per skin was $120, obtained for a pelt sold singly.

On October 19, 1931, there were sold at public auction at St. Louis 445 blue and 26 white fox skins taken on the Pribilof Islands in the 1930–31 season. The blue pelts brought $11,015, an average of $24.75 per skin; and the white pelts brought $466, an average of

$17.92 per skin. The maximum price per skin was $86, obtained for a single blue pelt.

## SEA-OTTER SKINS

Two sea-otter skins were sold at public auction at St. Louis, Mo., on October 19, 1931, for Government account. These skins were reported to have been taken from animals found dead—one on the beach near Perryville, Alaska, and one at Nakalilok Bay—and had been surrendered to bureau employees in August, 1930, and July, 1931, respectively. When sold one of the skins brought $60 and one $370, a total of $430.

## FUR-SEAL PATROL

### UNITED STATES COAST GUARD

A patrol for the protection of the fur seals of the North Pacific was again maintained by the U. S. Coast Guard, which assigned six cutters and a 125-foot patrol boat to participate in this work.

Beginning April 5 the *Snohomish* patrolled from the mouth of the Columbia River to Dixon Entrance until the fur-seal herd had passed. The *Tallapoosa* covered the area between Dixon Entrance and Kodiak Island from April 15 to 30 and between Kodiak Island and Unalaska from May 1 to 15, patrolling thereafter in the Bering Sea region. The *Shoshone* and the 125-foot patrol boat sailed from San Francisco about the middle of April for Unalaska, where the former was based until July and the latter until the close of the season. The *Itasca* and *Chelan* also engaged in the fur-seal patrol in Bering Sea during the latter part of the season. On its annual cruise from San Francisco to the Arctic Ocean the *Northland* patrolled waters frequented by the fur seals. The season's patrol extended as far westward as Attu, the westernmost island of the Aleutian chain, and was prosecuted in each locality as long as the circumstances required.

### BUREAU OF FISHERIES

From March 26 to the end of May the *Brant* patrolled the waters in the vicinity of Cape Flattery. With the concurrence of the Bureau of Indian Affairs a representative of the Bureau of Fisheries was on duty at La Push to enforce compliance with the regulations prohibiting the use of firearms and motor boats in the taking of fur-seal skins by the Indians. The *Widgeon* was engaged in seal patrol in the vicinity of Sitka in April and May.

## SEALING PRIVILEGES ACCORDED ABORIGINES

Under the provisions of the North Pacific Sealing Convention of July 7, 1911, Indians and other aborigines dwelling on the coasts of the waters designated by the convention may take fur-seal skins under limited conditions. In 1931 there were taken and duly authenticated by officials of the respective Governments 1,649 fur-seal skins, of which 186 were taken by Indians under the jurisdiction of the United States and 1,463 by Indians of Canada. The details are as follows:

*Washington.*—A total of 165 skins taken by the Indians of Washington were authenticated. Of these, 24 were from male seals and 141 from females. The skins were taken by Indians of La Push and Neah Bay in the months from April to June, inclusive, and were authenti-

cated by Raymond H. Bitney, superintendent of the Neah Bay Indian Agency, Neah Bay, Wash.

*Alaska.*—Twenty-one skins taken by natives of Sitka were authenticated by the master of the bureau's patrol vessel *Widgeon*. Of these skins, 5 were reported to be from male seals, 14 from females, and 2 from unborn pups. The seals from which the skins were secured were taken in waters off Biorka Island in the month of May.

*British Columbia.*—An official report received by the bureau stated that 1,463 fur-seal skins were taken by Indians off the British Columbia coast during 1931. Of these skins, 55 were from the Queen Charlotte Island area, 21 from the Grenville-Principe area, and 1,387 from the west coast of Vancouver Island.

### JAPANESE SEALSKINS DELIVERED TO THE UNITED STATES

Under the terms of the North Pacific Sealing Convention of July 7, 1911, there were allotted to the United States 170 Japanese fur-seal skins, or 10 per cent of the number taken by Japan in territory under its jurisdiction in the year 1931. These skins were received by the department's selling agents at St. Louis, Mo., on February 8, 1932.

### INTERNATIONAL COLONIAL EXPOSITION AT PARIS

An appropriate display in respect to the fishery and fur-seal industries of Alaska was included in the American exhibits at the International Colonial Exposition held at Paris from May 1 through October, 1931. Among the articles assembled by the bureau were a life-sized reproduction of a chinook salmon, models of salmon steaks and fillets, canned salmon and clams, a mounted fur seal, several dressed and dyed fur-seal skins, and two fur-seal jackets.

## COMPUTATION OF FUR SEALS, PRIBILOF ISLANDS, 1931

By Harry J. Christoffers

During the summer sealing season of 1931 there were killed at the Pribilof Islands 47,767 3-year-old male fur seals, compared with 41,409 3-year-old males killed in 1930. This is an increase of slightly over 15 per cent—considerably more than has been regarded as the average rate of increase for the herd. All of this means that the herd, and consequently the take of skins, is increasing much faster than was previously estimated. It does not mean that so many 3-year-olds were killed that there were not enough left for breeding requirements. The large number in drives on the last days of commercial killings and the large number of 3-year-old males observed on hauling grounds after killing and marking operations ceased on July 31 clearly indicate that the herd is in an extremely satisfactory condition. It is not to be expected that the present rate of increase of killable seals will continue constant from year to year, but the average rate may be kept fairly close to the present if sufficient surplus males are reserved each year for breeding requirements. It is felt that an adequate breeding reserve will be assured if sealing is discontinued about July 25 and careful observations are made throughout the season.

In 1931 all classes of seals, especially the cows, were extremely late in arriving. This condition has existed for the last several years, but was even more pronounced this season. Up to the middle of

July it did not appear that the number to be killed would be greater than in the previous season. At that time, however, all classes of seals arrived in large numbers, immediately changing the outlook. The final results exceeded all expectations.

## BULLS

In order to determine whether sufficient males were on hand for breeding requirements, a census of harem and idle bulls was again taken. Reef and Gorbatch rookeries, on St. Paul Island, were counted by Robert B. Payne and the writer. All other rookeries on St. Paul Island were counted by Mr. Payne and A. Christoffersen. The count on St. George Island was made by Lee C. McMillin and the writer. All rookery counts are made by two persons, thus affording a means of verifying the results. When necessary to estimate small uncountable areas a conservative figure is arrived at by close comparison with surrounding areas.

Sivutch rookery on Sea Lion Rock was visited on July 30. At that time harems were broken up, but a careful observation of the number of bulls remaining indicated that the estimated number of bulls on this rookery is very conservative. Harem areas were still so congested that it was not possible to make an accurate count, even at that late date. A very small portion of the rock was occupied by bachelors, but it is not known whether the bulls permit them to occupy this area during the more active portion of the season.

South rookery, St. George Island, maintained the abnormal increase of last season, with a resulting inaccurate figure for the average harem. As stated in previous reports, however, this will not affect the average harem for the island as a whole.

Probably due to some unusual condition, there was a wider divergence than usual in rates of growth of rookeries, as shown by the count of harem bulls and the abnormal increase in killings on some rookeries. This may be due to the early filling up of the more advantageous areas, thus requiring bulls to move to other rookeries to secure suitable harem space.

The surplus bull plays an extremely important part in increasing the rate of growth of the herd. The idle bull is a potential harem bull. He occupies a space in the rear or side of the rookery, and as the rookery fills up with cows he is likely to become a harem bull. Then additional surplus bulls appear and become idle bulls and finally harem bulls. The surplus bulls that do not become idle or harem bulls continually roam around on the outskirts of the breeding areas and hauling grounds. After the active breeding season is over, they take care of the thousands of virgin cows that arrive—this year's estimate places the number of virgin cows at 78,410. Without these surplus bulls a large proportion of the virgin females would remain unimpregnated. At that late date the harem bulls have either retired or are too exhausted to constantly move around in search of virgin cows. They prefer to find a quiet resting place away from the continual uproar of the rookeries. It is essential, therefore, to have a large number of surplus bulls, even though they interfere with driving throughout a great part of the season.

*Number of harem and idle bulls, approximate ratio of idle bulls to harem bulls, and average harem, 1931*

| Rookery | Date | Harem bulls | Idle bulls | Total | Approximate ratio of idle bulls to harem bulls | Average harem |
|---|---|---|---|---|---|---|
| St. Paul Island: | | | | | | |
| Kitovi | July 21 | 344 | 61 | 405 | 1:6 | 34.49 |
| Lukanin | do | 129 | 37 | 166 | 1:3 | 44.46 |
| Gorbatch | July 15 | 587 | 108 | 695 | 1:5 | 51.31 |
| Ardiguen | do | 108 | 12 | 120 | 1:9 | 26.38 |
| Reef | do | 1,266 | 284 | 1,550 | 1:4 | 47.79 |
| Sivutch (estimated) | | 395 | 80 | 475 | 1:5 | 46.87 |
| Lagoon (actual count) | July 23 | 4 | | 4 | | 28.50 |
| Tolstoi | July 21 | 831 | 194 | 1,025 | 1:4 | 42.86 |
| Zapadni | July 22 | 657 | 141 | 798 | 1:5 | 52.10 |
| Little Zapadni | do | 413 | 84 | 497 | 1:5 | 42.24 |
| Zapadni Reef | do | 37 | 8 | 45 | 1:5 | 16.38 |
| Polovina | July 23 | 353 | 81 | 434 | 1:4 | 34.84 |
| Polovina Cliffs | do | 261 | 63 | 324 | 1:4 | 25.80 |
| Little Polovina | do | 108 | 12 | 120 | 1:9 | 22.71 |
| Morjovi | July 24 | 255 | 71 | 326 | 1:4 | 17.29 |
| Vostochni | do | 1,809 | 283 | 2,092 | 1:6 | 27.13 |
| Total | | 7,557 | 1,519 | 9,076 | 1:5 | 38.71 |
| St. George Island: | | | | | | |
| North | July 20 | 599 | 121 | 720 | 1:5 | 39.85 |
| Staraya Artil | do | 433 | 92 | 525 | 1:5 | 41.54 |
| Zapadni | July 22 | 131 | 53 | 184 | 1:2 | 19.37 |
| South | do | 91 | 5 | 96 | 1:18 | 6.54 |
| East Reef | July 19 | 141 | 26 | 167 | 1:5 | 38.79 |
| East Cliffs | do | 281 | 72 | 353 | 1:4 | 55.57 |
| Total | | 1,676 | 369 | 2,045 | 1:5 | 39.42 |
| Total (both islands) | | 9,233 | 1,888 | 11,121 | 1:5 | 38.84 |

## AVERAGE HAREM

The average harem has been determined through actual count of bulls and on the basis of an increase of 8 per cent over the previous year for cows. The estimated average harem for St. Paul Island is 38.71, and for St. George Island 39.42. The average harem for the two islands is 38.84; a decrease of 1.11 from the previous year. This brings the average harem down to a point which by some is considered practically ideal, although it would possibly be to the best interests of the herd to bring down the average harem somewhat lower.

It has been clearly demonstrated that the herd will increase much faster if there is a larger number of harem, idle, and surplus bulls, than if barely sufficient males for harem requirements are permitted to mature. In regard to the average harem, it is essential to consider both islands as a whole, for it is not possible to make an actual count of cows. As various conditions continually cause temporary, or permanent, increases or decreases in the number of cows and bulls on any given rookery, the present method of applying the same average rate of increase for cows to each rookery obviously results in incorrect figures for each particular rookery. It is impossible accurately to correct these errors, inasmuch as a pup count is impractical. The average harem for each island, and more particularly the average harem for the two islands as a whole, however, will be fairly correct—at least sufficiently so for all practical requirements.

*Computation of breeding cows, based on annual increase of 8 per cent, and of average harems, in 1931*

| Rookery | Breeding cows | | Harem bulls, 1931 | Average harem | | |
|---|---|---|---|---|---|---|
| | 1930 | 1931 | | 1931 | 1930 | Increase (+) or decrease (−) in 1931 from 1930 |
| St. Paul Island: | | | | | | |
| Kitovi | 10,984 | 11,863 | 344 | 34.49 | 36.37 | −1.88 |
| Lukanin | 5,310 | 5,735 | 129 | 44.46 | 48.72 | −4.26 |
| Gorbatch | 27,889 | 30,120 | 587 | 51.31 | 45.20 | +6.11 |
| Ardiguen | 2,638 | 2,849 | 108 | 26.38 | 34.26 | −7.88 |
| Reef | 56,020 | 60,501 | 1,266 | 47.79 | 49.71 | −1.92 |
| Sivutch | 17,142 | 18,513 | 395 | 46.87 | 43.95 | +2.92 |
| Lagoon (actual count pups) | 113 | 114 | 4 | 28.50 | 56.50 | −28.00 |
| Tolstoi | 32,978 | 35,616 | 831 | 42.86 | 45.24 | −2.38 |
| Zapadni | 31,693 | 34,228 | 657 | 52.10 | 54.55 | −2.45 |
| Little Zapadni | 16,155 | 17,447 | 413 | 42.24 | 45.00 | −2.76 |
| Zapadni Reef | 561 | 606 | 37 | 16.38 | 19.34 | −2.96 |
| Polovina | 11,380 | 12,300 | 353 | 34.84 | 27.25 | +7.59 |
| Polovina Cliffs | 6,236 | 6,735 | 261 | 25.80 | 30.57 | +4.77 |
| Little Polovina | 2,271 | 2,453 | 108 | 22.71 | 23.65 | −.94 |
| Morjovi | 4,082 | 4,409 | 255 | 17.29 | 18.06 | −.77 |
| Vostochni | 45,444 | 49,080 | 1,809 | 27.13 | 29.19 | −2.06 |
| Total | 270,905 | 292,569 | 7,557 | 38.71 | 39.70 | −.99 |
| St. George Island: | | | | | | |
| North | 22,101 | 23,869 | 599 | 39.85 | 46.24 | −6.39 |
| Staraya Artil | 16,653 | 17,985 | 433 | 41.54 | 47.04 | −5.50 |
| Zapadni | 2,350 | 2,538 | 131 | 19.37 | 16.32 | +3.05 |
| South | 551 | 595 | 91 | 6.54 | 6.41 | +.13 |
| East Reef | 5,065 | 5,470 | 141 | 38.79 | 37.80 | +.99 |
| East Cliffs | 14,459 | 15,616 | 281 | 55.57 | 49.35 | +6.22 |
| Total | 61,179 | 66,073 | 1,676 | 39.42 | 41.09 | −1.67 |
| Total (both islands) | 332,084 | 358,642 | 9,233 | 38.84 | 39.95 | −1.11 |

## PUPS AND COWS

The number of cows and pups present was determined by applying an increase of 8 per cent to the number of cows computed for August 10, 1930. This average rate of increase, as determined by actual pup counts of 1917 and 1922, has been found to work out approximately correct and has therefore been used continuously since 1923.

Owing to the continual variance from year to year of the number of animals present on the several rookeries, the figures computed for each individual rookery will not be correct, but the total number, as computed for the two islands as a whole, will be very close to the actual number of animals on hand. Actual rates of increase of the total number present on both islands may also vary considerably from year to year. It is necessary, therefore, to use a conservative average rate of increase over a number of years.

The providing of a sufficient breeding reserve during the last nine years has, no doubt, resulted in a greater average annual increase for this period, but with no definite data on hand as a basis for increasing this rate, it is essential to continue to use the rate of increase established by definite facts. If the yearly rate of increase of killable 3-year-old males continues, however, it will shortly be necessary to raise the rate of increase of pups and cows. These increases in rates of growth are undoubtedly due to provision of a larger breeding reserve than was provided previous to 1923, making it possible

for all females to be impregnated and resulting therefore in a greater increase in birth rate the following year.

On account of the fact that more densely populated and more favorably situated rookeries increase, as a rule, faster than the sparsely populated areas, it will also be necessary some time to make proper adjustments to show more accurately the number of animals on each separate rookery.

The proportion of dead pups found on the various rookeries in 1922 has again been applied to each rookery. For comparative purposes, to show the actual number of cows on hand, and to provide figures on which to base the increase for the following year, it is necessary to include the estimated number of dead pups in the total number of pups.

*Distribution of pups on the Pribilof Islands, August 10, 1931, and comparison with distribution in 1930*

| Rookery | 1931 | | | | 1930 | 1931 |
|---|---|---|---|---|---|---|
| | Living pups | Dead pups | Total pups | Per cent dead pups | Total pups | Increase |
| St. Paul Island: | | | | | | |
| Kitovi | 11,689 | 174 | 11,863 | 1.47 | 10,984 | 879 |
| Lukanin | 5,611 | 124 | 5,735 | 2.17 | 5,310 | 425 |
| Gorbatch | 29,861 | 259 | 30,120 | .86 | 27,889 | 2,231 |
| Ardiguen | 2,781 | 68 | 2,849 | 2.39 | 2,638 | 211 |
| Reef | 59,618 | 883 | 60,501 | 1.46 | 56,020 | 4,481 |
| Sivutch | 18,061 | 452 | 18,513 | 2.44 | 17,142 | 1,371 |
| Lagoon (actual count) | 114 | | 114 | | 113 | 1 |
| Tolstoi | 35,121 | 495 | 35,616 | 1.39 | 32,978 | 2,638 |
| Zapadni | 33,639 | 589 | 34,228 | 1.72 | 31,693 | 2,585 |
| Little Zapadni | 17,011 | 436 | 17,447 | 2.50 | 16,155 | 1,292 |
| Zapadni Reef | 601 | 5 | 606 | .80 | 561 | 45 |
| Polovina | 12,112 | 188 | 12,300 | 1.53 | 11,389 | 911 |
| Polovina Cliffs | 6,610 | 125 | 6,735 | 1.85 | 6,236 | 499 |
| Little Polovina | 2,391 | 62 | 2,453 | 2.51 | 2,271 | 182 |
| Morjovi | 4,320 | 89 | 4,409 | 2.02 | 4,082 | 327 |
| Vostochni | 48,059 | 1,021 | 49,080 | 2.08 | 45,444 | 3,636 |
| Total | 287,599 | 4,970 | 292,569 | 1.70 | 270,905 | 21,664 |
| St. George Island: | | | | | | |
| North | 23,535 | 334 | 23,869 | 1.40 | 22,101 | 1,768 |
| Staraya Artil | 17,521 | 464 | 17,985 | 2.58 | 16,653 | 1,332 |
| Zapadni | 2,510 | 28 | 2,538 | 1.12 | 2,350 | 188 |
| South | 585 | 10 | 595 | 1.72 | 551 | 44 |
| East Reef | 5,387 | 83 | 5,470 | 1.51 | 5,065 | 405 |
| East Cliffs | 15,383 | 233 | 15,616 | 1.49 | 14,459 | 1,157 |
| Total | 64,921 | 1,152 | 66,073 | 1.74 | 61,179 | 4,894 |
| Total (both islands) | 352,520 | 6,122 | 358,642 | 1.71 | 332,084 | 26,558 |

## MORTALITY OF SEALS AT SEA

No change was made in the mortality rates used this season to determine the number of seals of various ages in the herd. Though the mortality rate of seals at sea undoubtedly varies considerably from year to year, the present ultraconservative rates used answer all practical purposes to determine the approximate number of animals in the herd. It will be necessary, however, to make temporary adjustments from time to time when actual observations show a greater number of animals on hand than census figures indicate; for instance, during the present season it was very evident, from observations and

actual counts, that there were at least 3,000 surplus bulls on the hauling grounds of both islands; therefore, for the present season, a deduction of 50 per cent, for losses due to fighting, natural causes, and errors in loss percentage in previous years, was not necessary. If this deduction had been made, it would have shown only 1,646 surplus bulls on hand, compared with 3,943 in 1930. Obviously, this would have been incorrect.

Observations indicate that there were more than 13,198 3-year-old males on hand on August 10. This would indicate a smaller mortality rate during a portion of their previous existence or a greater pup increase than 8 per cent, or a combination of both. However, no change has been made in mortality rates, and no adjustment has been made to take care of the apparently greater number of 3-year-olds on hand than computation indicates. No change should be made until it is fully evident that such increases or decreases will remain constant from year to year.

Reports of previous years show reasons for methods used in determining mortality rates.

## COMPLETE COMPUTATION

The following complete computation shows the various methods used at present to determine the approximate number of seals of the various age classes in the herd. It will be noted that there were 81,981 more animals at the end of the sealing season of 1931 than were present at the same time the previous season. This is an increase for the herd of 7.84 per cent, as compared with an increase of 7.57 per cent in 1930. It also compares favorably with the 8 per cent increase of pups and cows.

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1931*

| Class | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| Pups, estimated | 292,569 | 66,073 | 358,642 |
| Breeding cows, 3 years old and over, by inference | 292,569 | 66,073 | 358,642 |
| Harem bulls, counted | 7,557 | 1,676 | 9,233 |
| Idle bulls, counted | 1,519 | 369 | 1,888 |
| Yearlings, male and female, estimated: | | | |
| Females born in 1930 | 135,453 | 30,590 | 166,043 |
| Natural mortality, 40 per cent | 54,181 | 12,236 | 66,417 |
| Yearling females, Aug. 10, 1931 | 81,272 | 18,354 | 99,626 |
| Males born in 1930 | 135,452 | 30,589 | 166,041 |
| Natural mortality, 40 per cent | 54,181 | 12,236 | 66,417 |
| Yearling males beginning 1931 | 81,271 | 18,353 | 99,624 |
| Yearling males killed in 1931 | 12 | | 12 |
| Yearling males, Aug. 10, 1931 | 81,259 | 18,353 | 99,612 |
| 2-year-olds, male and female, estimated: | | | |
| Yearling females, Aug. 10, 1930 | 75,253 | 16,994 | 92,247 |
| Natural mortality, 15 per cent | 11,288 | 2,549 | 13,837 |
| 2-year-old females, Aug. 10, 1931 | 63,965 | 14,445 | 78,410 |
| Yearling males, Aug. 10, 1930 | 75,238 | 16,994 | 92,232 |
| Natural mortality, 17.5 per cent | 13,167 | 2,974 | 16,141 |
| 2-year-olds beginning 1931 | 62,071 | 14,020 | 76,091 |
| 2-year-olds killed in 1931 | 1,064 | 199 | 1,263 |
| 2-year-old males, Aug. 10, 1931 | 61,007 | 13,821 | 74,828 |

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1931*—Cont'd

| Class | St. Paul Island | St. George Island | Total |
|---|---|---|---|
| 3-year-old males, estimated: | | | |
| 2-year-old males, Aug. 10, 1930 | 56,745 | 12,929 | 69,674 |
| Natural mortality, 12.5 per cent | 7,093 | 1,616 | 8,709 |
| 3-year-old males beginning 1931 | 49,652 | 11,313 | 60,965 |
| 3-year-old males killed in 1931 | 38,559 | 9,208 | 47,767 |
| 3-year-old males, Aug. 10, 1931 | 11,093 | 2,105 | 13,198 |
| 4-year-old males, estimated: | | | |
| 3-year-old males, Aug. 10, 1930 | 12,440 | 2,431 | 14,871 |
| Natural mortality, 10 per cent | 1,244 | 243 | 1,487 |
| 4-year-old males beginning 1931 | 11,196 | 2,188 | 13,384 |
| 4-year-old males killed in 1931 | 284 | 134 | 418 |
| 4-year-old males, Aug. 10, 1931 | 10,912 | 2,054 | 12,966 |
| 5-year-old males, estimated: | | | |
| 4-year-old males, Aug. 10, 1930 | 8,805 | 2,522 | 11,327 |
| Natural mortality, 10 per cent | 880 | 252 | 1,132 |
| 5-year-old males beginning 1931 | 7,925 | 2,270 | 10,195 |
| 5-year-old males killed in 1931 | 1 | 1 | 2 |
| 5-year-old males, Aug. 10, 1931 | 7,924 | 2,269 | 10,193 |
| 6-year-old males, estimated: | | | |
| 5-year-old males, Aug. 10, 1930 | (1) | (1) | 8,191 |
| Natural mortality, 20 per cent | | | 1,638 |
| 6-year-old males beginning 1931 | | | 6,553 |
| 6-year-old males killed in 1931 | | | |
| 6-year-old males, Aug. 10, 1931 | | | 6,553 |
| Surplus bulls, 7 years old and over, estimated: | | | |
| 6-year-old males, Aug. 10, 1930 | (1) | (1) | 5,612 |
| Natural mortality, 20 per cent | | | 1,122 |
| 7-year-old males beginning 1931 | | | 4,490 |
| 7-year-old males killed in 1931 | | | |
| 7-year-old males, Aug. 10, 1931 | | | 4,490 |
| Surplus bulls, Aug. 10, 1930 | | | 3,963 |
| Natural mortality, 30 per cent | | | 1,189 |
| Remaining surplus for 1931 | | | 2,774 |
| Breeding bulls of 1930 | 8,378 | 1,833 | 10,211 |
| Natural mortality, 30 per cent | 2,513 | 550 | 3,063 |
| 1930 bulls remaining in 1931 | 5,865 | 1,283 | 7,148 |
| Breeding bulls of 1931 | 9,076 | 2,045 | 11,121 |
| 1930 bulls remaining, deducted | 5,865 | 1,283 | 7,148 |
| Increment of new bulls in 1931 | 3,211 | 762 | 3,973 |
| 7-year-old males computed for 1931 | | | 4,490 |
| Surplus bulls computed for 1931 | | | 2,774 |
| Total theoretical bull stock, 1931 | | | 7,264 |
| New increment of breeding bulls deducted | | | 3,973 |
| Surplus bulls, Aug. 10, 1931 | | | 3,291 |

[1] Estimates have been worked out, in so far as possible, to show the approximate number of seals of each class which should be credited to each island. Seals do not, however, haul out in accordance with figures given. Seals born on either island frequent the other island. They travel promiscuously between and haul out on either of the two islands. The total for both islands is, however, approximately correct.

*Complete computation of fur seals, Pribilof Islands, as of August 10, 1931*—Cont'd

RECAPITULATION

| Class | Total | Class | Total |
|---|---|---|---|
| Pups | 358,642 | 5-year-old males | 10,193 |
| Cows | 358,642 | 6-year-old males | 6,553 |
| Harem bulls | 9,233 | Surplus bulls | 3,291 |
| Idle bulls | 1,888 | | |
| Yearling females | 99,626 | Total, 1931 | 1,127,082 |
| Yearling males | 99,612 | | |
| 2-year-old females | 78,410 | Total, 1930 | 1,045,101 |
| 2-year-old males | 74,828 | Numerical increase, 1931 | 81,981 |
| 3-year-old males | 13,198 | Per cent increase, 1931 | 7.84 |
| 4-year-old males | 12,966 | | |

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# FISHERY INDUSTRIES OF THE UNITED STATES, 1931 [1]

By R. H. Fiedler

*Chief, Division of Fishery Industries*

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[1] Appendix II to the Report of the U. S. Commissioner of Fisheries, 1932. Approved for publication May 19, 1932.

## FOREWORD

This report constitutes a summary of the activities of the division of fishery industries as well as an annual review on fishery statistics of the United States. As its name indicates, this division of the bureau is concerned with the activities and welfare of the fishery industries, including the commercial fisheries, the trade in fishery products, and the fish canning and preserving industries. Its functions include the collection and publication of fishery statistics, the conducting of market surveys, the prosecution of research designed to solve the technical problems of the industry, and the dissemination of authoritative and practical information to the fishery industries and the public. Results of technological investigations and marketing studies are published in separate documents as each project is completed. The information obtained from statistical surveys is published in part 2 of this report, which includes all the detailed statistical information that has become available since the issuance of the previous report,[2] together with such summarized statements and interpretations of the statistics as are deemed significant and useful. In the preparation of this report, members of the division's staff have taken part and their assistance is appreciatively acknowledged.

## Part 1. OPERATIONS OF THE DIVISION

### COLLECTION OF STATISTICS

The statistical work of the division in 1931, as in former years, included the collection and dissemination of statistics on the catch of fishery products and the gear employed in making the catch, and statistics of related fishery industries. In the former group are statistics that are intended for the use of the fishery biologist, upon which to base conservation measures. They are also valuable for economic purposes. This is especially true of statistics of the landings of fish at principal fishing ports, which are published monthly. In the second group are statistics that are of use mainly for economic or trade purposes. These include statistics of the manufactured fishery products and by-products of the United States, cold-storage holdings of fish and amounts of fish frozen in the United States, marine-animal oil production, and similar statistics.

Continuing with the plan of making annual general statistical surveys of the fisheries of various geographical sections, the division in 1931 under the direction of F. F. Johnson canvassed the fisheries prosecuted in our entire coastal and lake sections, obtaining catch figures for 1930. The fisheries of the Mississippi River and its tributaries were not canvassed for 1930, but a survey is now in progress in which figures for 1931 are being obtained. Continuous annual catch figures are now available for the Great Lakes from 1913, Pacific Coast States from 1922, South Atlantic and Gulf States from 1927, New England States from 1928, and the Middle Atlantic and Chesapeake Bay States from 1929. While a complete canvass has not been made for the fisheries of the Mississippi River and tributaries since 1922, annual figures have been obtained on the catch of fresh-water mussels

[2] Fishery Industries of the United States, 1930. By R. H. Fiedler, Appendix II to the Report of the U. S. Commissioner of Fisheries for 1931, pp. 109–552.

in this area since 1929 (about 50 per cent of the total yield of fishery products in the Mississippi Valley consists of mussel shells) and for Lakes Pepin and Keokuk since 1927.

In addition to the general catch statistics, the collection and (or) publication of statistics on special subjects was continued during 1931, as follows: The landings of fish by American fishing vessels at the ports of Boston and Gloucester, Mass., Portland, Me., and Seattle, Wash.; landings of halibut at North Pacific coast ports (published monthly, and annual bulletins summarizing these landings for the year); catch of mackerel in the North Atlantic fishery; cold-storage holdings of frozen and cured fish and amount of fish frozen, which are furnished by the Bureau of Agricultural Economics (published monthly); production, consumption, and holdings of marine-animal oils of the United States and Alaska (published quarterly by the Bureau of the Census); production of manufactured fishery products and by-products of the United States and Alaska during 1931; the catch of shad in the Potomac and Hudson Rivers, and the catch of alewives in in the Potomac River during 1931; transactions on the sponge exchange at Tarpon Springs, Fla., during 1931; volume of fishery products handled at the municipal fish wharf and market, Washington, D. C., during 1931; and the volume of United States imports and exports of fishery products during 1931, furnished by the Bureau of Foreign and Domestic Commerce.

In the above surveys the division continued to receive cooperation from many of the State fishery agencies, which aided materially in the work. This, together with the use of automobiles by the agents for travel, has enabled the bureau to canvass the territory more expeditiously, efficiently, and economically.

## STATISTICAL CONFERENCE

On February 19, 20, and 21, 1931, the division held its second conference with its statistical agents from all sections of the country at the headquarters of the bureau in Washington, D. C. This was for the purpose of acquainting the agents with new methods for collecting fishery statistics which are intended to show the scope of the diversified interests in the industry, and also to give the agents an opportunity to discuss and solve various perplexing problems relating to the work.

The morning session of the first day Commissioner O'Malley delivered an address of welcome, which was followed by an address on statistical research in the fisheries by the writer. The program for the remainder of that day and the next two days was devoted to general discussion of the work with Fred F. Johnson as chairman.

## CATCH ANALYSIS, COLUMBIA RIVER CHINOOK-SALMON FISHERY

The statistical analysis of the records of daily catches of chinook salmon made by individual fishermen on the Columbia River was continued during 1931 by Joe A. Craig, director of the Seattle (Wash.) Laboratory. The data were treated statistically in order to determine the average catch per constant unit of effort and gear of chinook salmon on the Columbia River during the period from 1905 to 1930, inclusive.

From these data indices of abundance have been made, which indicates the relative abundance of chinook salmon in this river system from year to year and during short periods of time for each individual year. In this way not only the fluctuations in abundance of the entire population of chinook of the Columbia River have been followed from one year to the next, but also indices of abundance for portions of the migrating salmon population called "runs," which are probably biologically distinct and self-maintaining, have been computed.

The investigations of 1931 consisted of a detailed consideration of the data available, and show that from 1909 to 1925, inclusive, the chinook salmon of the Columbia River appeared to withstand the strain of fishing to which they were subjected without any noticeable decline in total numbers. However, from 1926 to 1930, the catch per unit of effort and gear, which is a measure of abundance, has declined noticeably. Also, it appears that certain of the "runs" or races are suffering a more pronounced decline in numbers than others.

## TECHNOLOGICAL INVESTIGATIONS

It has been said that the application of science is useful to industry during booms, is indispensable when times are normal, and vital when they become hard. Possibly this applies to the fishing industry with greater force than to any other of our basic food industries. During the past year the fisheries have passed through a most trying period. Producers and wholesalers experienced difficulty in marketing fresh and canned fishery products. The market for fish meals and oils was depressed. Some of the important fisheries have shown signs of depletion, and competition with other food products has become keener. At times like these, in order to operate successfully, it is important that losses be minimized, and that the products available be utilized to the fullest extent. The technological research of the bureau has been aimed toward this end, and where the industry has applied the results of this research to its commercial procedure it has been benefited according to the effort expended. As a result, research by the bureau has shown ways for lengthening the life of certain types of textile fishing gear; various types of fishing gear have been developed which have a greater selectivity, thereby allowing small and immature fish to escape; methods have been developed for preventing rusting and shrinkage of frozen fish in cold storage, and undue losses and food value of fresh fish shipped with ice as a refrigerant; methods also have been developed for manufacturing fish meals and oils of higher nutritional value, and chemical and biochemical studies have demonstrated the richness of some fish, shellfish, and their products in protein, minerals, and vitamins. This work has had a stabilizing influence on the fisheries, and has enabled them to carry on in a more efficient and successful manner than would otherwise have been possible.

### RESEARCH ASSOCIATE

In the above lines of technological research the bureau has attacked those fundamental problems which promise to be of greatest value to the largest number and which are possible with the funds and per-

sonnel available for the purpose. For this reason, the division has not been able to study special problems affecting certain products, processes, or methods. In order to serve the industry in this connection, the bureau by congressional authorization has provided research associate facilities whereby firms or groups having special technological problems to solve will furnish the investigator and pay his salary and expenses. The investigation is carried out in cooperation with the bureau's staff in its laboratories and under its control. This makes available to the industry laboratory, consultation, and library facilities which they are unable to obtain elsewhere.

During the past year, a manufacturer of marine products took advantage of these facilities and placed a chemist in the division's laboratory to make a study of the nutritive value of kelp meal.

## LABORATORIES

During the past year the division carried on its technological research work under the direction of John Ruel Manning at laboratories in Washington, D. C., and Gloucester, Mass., and has provided equipment for a laboratory in the bureau's new building in Seattle, Wash. In addition, work was conducted in other laboratories as conditions warranted. For instance, certain cooperative biochemical studies were conducted at the laboratories of the South Carolina Food Research Commission, Charleston, S. C.; at the laboratory of the Bureau of Chemistry and Soils, United States Department of Agriculture, Washington, D. C.; and at experimental farms of the Department of Agriculture and the Ohio Agricultural Experiment Station. Research on the refrigerating, salting, and smoking of fish was conducted in the Virgin Islands and in Puerto Rico, and other investigations were conducted in the field where optimum working conditions obtained.

### WASHINGTON, D. C.

With the transfer of the bureau's headquarters from Sixth and B Streets SW., to the new Department of Commerce Building, Washington, D. C., the division's technological laboratories in the old quarters were dismantled and moved to the new building. Chemical, nutritional, and mechanical investigations relative to fishery products are now being carried on in these laboratories.

### GLOUCESTER, MASS.

During the year, the division completed the establishment of its technological research laboratory at Fort Square, Gloucester, Mass. This has been equipped to conduct various phases of fishery technological research, including refrigeration, smoking, bacteriology, by-products, and production methods.

The laboratory is located on the second floor of a building, along the water front facing Gloucester Harbor, and has wharf facilities on two sides. This is convenient as it enables the technologists to come into close contact with the fishing fleet operating out of this port. It also enables them to obtain laboratory samples, with which to experiment, directly from vessels as a large number of them land their fares at this wharf.

The laboratory was designed and equipped by the bureau's technologists and is particularly well adapted for fishery research. Practically all of the equipment was designed for specific purposes and is particularly adapted for the study of the problems for which it is intended.

In June of 1931, two of the technologists, from the Washington staff, were transferred to Gloucester to continue their activities in this laboratory. In addition to these, and the one previously assigned there, three new technologists were appointed, for assignment to this laboratory, to assist in the studies being conducted there. The staff of this laboratory also includes a clerk and an expert mechanic.

During this transfer of activities, from Washington to Gloucester, it was necessary for the study of some of the problems to be suspended for a period. These were resumed the latter part of the year, when the laboratory had been completely equipped with the necessary apparatus.

### SEATTLE, WASH.

During 1931 the division provided equipment for a technological laboratory on the second floor of the bureau's new fisheries station on Lake Union in Seattle, Wash. It is planned to begin technological investigations there in 1932, when studies will be made on the manufacture of salmon body and liver oils.

## NUTRITIVE VALUE OF MARINE PRODUCTS

### NUTRITION LABORATORY

In the course of the bureau's investigative work it is necessary to determine the comparative food values of various fishery products, the relative efficiency of different processes of manufacture, methods for evaluating and comparing the products experimented with by its technologists, and the effects or changes on food values resulting from manufacturing by canning, curing, smoking, and freezing. Without means for accomplishing these things there would be no standard of comparison of results or means for evaluating products produced in different ways. Thus it became essential for the proper conduct of its work to make provisions for nutrition work. Cooperative arrangements with other agencies temporarily enabled the bureau to care for some of the more pressing problems having to do with commercial products. To promote the efficiency of the program of research of its own technologists and to standardize the products of industry the bureau has provided nutrition laboratory facilities and began experimental work in its own laboratory in Washington, D. C., in July, 1931. This has been one of the most important contributions made in recent years to the effectiveness of its own work and productive of beneficial results to industry.

### BURBOT-LIVER OIL

Under a working arrangement with the Bureau of Chemistry and Soils, United States Department of Agriculture, as described in the 1929 and 1930 reports of this division, Dr. Chester D. Tolle, of the bureau, and Dr. E. M. Nelson and Dr. G. S. Jamieson, of the Bureau

of Chemistry and Soils, completed an investigation concerning the chemical and physical properties and vitamin content of burbot-liver oil, in which it was shown that commercially produced burbot-liver oils were from four to ten times as potent in vitamin A and from three to four times as potent in vitamin D as medicinal cod-liver oil. It was also shown that these oils meet the United States Pharmacopœia X requirements for cod-liver oil with respect to specific gravity, iodine number, acid value, and unsaponifiable matter. The saponification values were approximately equal to the maximum permitted for cod-liver oil.

### ANTIANEMIC PROPERTIES OF OYSTERS

Through a cooperative arrangement with the South Carolina Food Research Commission, Charleston, S. C., E. Jack Coulson, of the bureau has made a study in the laboratories of this commission of the antianemic properties of oysters. Samples of oysters were gathered from the most important oyster beds of the Atlantic and Gulf waters and analyzed for iron, copper, and manganese.

From this study it is possible to group the samples into three distinct groups: (1) North Atlantic, with high copper, low iron, and low manganese, (2) South Atlantic, with high iron, low copper, and low manganese, and (3) Gulf, with high iron, low copper, and high manganese. When the oysters from different localities were fed to anemic animals they all induced regeneration of hemoglobin. The response of hemoglobin regeneration was directly proportional to the amount of iron present, thus indicating that copper was not the controlling factor. This investigation demonstrates the importance of oysters as a source of iron in addition to their other food factors. It also was demonstrated that the ether-soluble material in oysters saponified with alcoholic potash carries appreciable quantities of vitamin D.

A great deal of interest has been shown in fish flour as a result of cooperative investigations in which this product forms a part of the diet for children. These investigations which started about May, 1931, are still in progress and, therefore, no definite report can be made at this time.

To correlate its laboratory studies on the nutritive value of fishery products with the actual feeding of these products to farm animals, the bureau is cooperating with the United States Department of Agriculture, Bureau of Animal Industry, Experimental Farm, Beltsville, Md., and the Ohio Agricultural Experiment Station, Wooster, Ohio, in extending its nutrition studies to farm animals, such as poultry, sheep, swine, cattle, etc.

### KELP-MEAL EXPERIMENTS

A series of cooperative experiments with a producer of kelp meal have been conducted by Dr. H. P. Morris, a research associate, in the Washington laboratory to determine the nutritive value of kelp meal. One experiment of this series was conducted to learn the optimum level at which kelp meal can be fed as an addition to an otherwise complete diet composed of natural foodstuffs.

The additions of kelp meal were made to the diets of albino rats at levels of 3, 6, and 10 per cent. As a result it was found that no

essential difference in response was observed for the rats at any of the levels studied. The amount of kelp meal included in the ration, therefore, is dependent upon the cost of this product. Another group of animals was fed kelp meal at levels of 15, 22½, and 30 per cent. These animals showed no ill effects from the injection of diets containing these levels of kelp meal, and the rats were not affected by the large quantities of salt that would be contained in these amounts of kelp meal.

Another experiment was conducted to determine the ability of kelp meal to stimulate appetite. According to results obtained it appears that kelp meal has a beneficial effect in increasing both growth and food consumption. If it can be shown that kelp meal will be an aid to production of animals for early market maturity it will make this product of considerable value in the field of animal industry especially in the production of such products as hothouse lambs, broilers, etc.

Another experiment was conducted to determine the vitamin A content of kelp meal. It was shown that this product contains about one-fourth as much of vitamin A as alfalfa hay, approximately the same amount of vitamin A as fresh eggs, and one and one-half times as much of this vitamin as yellow corn. It is thus seen that kelp meal is a fairly good vegetable source of vitamin A, but could not compete with cod-liver oil and other fish oils as a source of vitamin A for animal feeding.

Further experiments were designed to test the supplementary value of kelp meal when added to rations containing various protein supplements. The results obtained showed that kelp meal has a very favorable effect on growth when fed in diets composed principally of ground yellow corn and cottonseed meal. The extra growth resulting from the addition of kelp meal was not due to the sodium and potassium salts contained in the kelp since quantities of these salts similar to the amounts contained in kelp meal were added to the control diet. These experiments indicate that kelp meal has a very definite supplementing effect on diets composed of corn and cottonseed meal thereby increasing the rate of growth with less food consumption per unit gain in weight.

## PRESERVATION OF FISHERY PRODUCTS FOR FOOD

### IMPROVED METHODS FOR HANDLING OF FRESH AND FROZEN FISH

It is known that fish begins to deteriorate immediately following death and that certain definite chemical changes occur during this decomposition. These chemical changes are the same whether the fish is preserved by ice, in a frozen state, or without preservation. Studies of these chemical changes by James M. Lemon show that the rate of decomposition is determined by the degree of preservation, this being retarded by icing or freezing. With this in mind research was directed toward developing a chemical means for determining the condition of the flesh as to freshness, age, or stage of decomposition. The method developed proved successful in the laboratory but is quite complicated and requires technical skill for operation. However, this method is being simplified so that it may have commercial application.

## IMPROVED METHODS FOR SMOKING FISH

In general commercial procedure it has been difficult to produce a uniform smoked fish product for the reason that no standards have been established for the methods involved or for the finished product.

In order to assist the industry in this respect the division is conducting a study of the smoking of fish.

During the past year James M. Lemon designed and had constructed at the Gloucester Laboratory an experimental smokehouse and with the assistance of Maurice E. Stansby, conducted studies on the smoking of fish. The smokehouse is portable and is constructed to reduce the fire hazard to a minimum. The smoke is produced in the lower section by feeding sawdust onto an electric hot plate. This sawdust is fed automatically from a hopper onto the electric burner, where it is mechanically distributed over the surface to produce an even smoke. The volume of smoke can be controlled by adjusting the speed with which the sawdust is fed into the burner. A blower forces the smoke from the burner, through the upper section or smoking compartment, thence to an exhaust to the air outside. A draught regulator is attached to this system which makes it possible to produce as rapid circulation as may be desired.

The smoking compartment in which the fish are hung is heated by an electric heater, the temperature of which can be accurately controlled. This makes it possible to study the effect of different temperatures on the fish.

The humidity in the smoking compartment is controlled by means of a water spray. This may be employed to increase the amount of moisture present in the smoke. Circulation of the smoke in this compartment is accomplished by an agitator. A continuous record of the temperature and humidity of the smoking compartment can be kept by means of recording instruments.

It is possible to duplicate previous results by manipulating the controls regulating the volume of the smoke, temperature, and humidity. Application of this method to commercial procedure should remove much of the guesswork from the art of smoking and enable producers to manufacture a uniform product.

## BACTERIOLOGICAL STUDIES

In the marketing of fresh fishery products and in their preservation by freezing, drying, salting, smoking, or canning various bacteriological changes take place which may hasten decomposition, contribute to preservation, or otherwise influence the manufacture of the finished product. These changes have received little attention by research workers with the result that losses in the fisheries, due to lack of knowledge of bacterial action, are enormous. In an effort to improve those processes or methods affected by bacteria the division established a bacteriological laboratory at its technological station in Gloucester, Mass. This research work during the past year was conducted by Francis P. Griffiths and has been concentrated upon determining the germicidal effect of smoke on fish and the nature of molds on smoked fish and their prevention. The bacteriology of fresh and frozen fish also has received attention. In this connection, it has been definitely shown that wounds produced in forking fish are fertile breeding grounds for bacteria.

## PRESERVATION OF FISHERY PRODUCTS IN THE VIRGIN ISLANDS AND PUERTO RICO

The fisheries of the Virgin Islands and Puerto Rico are only slightly developed, and the inhabitants import considerable quantities of cured fishery products. After comprehensive economic surveys of these islands by Norman D. Jarvis and the writer it was determined that the quantity of fish caught locally could be increased, and that the market could be expanded (1) by building up the market for fresh fish through the introduction of improved methods of handling and the use of ice; (2) by the establishment of a local fish-curing industry to provide a home product to replace imported cured fish.

It was found that methods of handling were primitive and unsanitary and that the use of ice was almost unknown. For these reasons fish less than a day old are believed to have caused food poisoning and considerable quantities of fish have had to be thrown away through spoilage. Experimental studies by N. D. Jarvis on icing and handling fish indicated that fresh fish products superior to any then marketed could be prepared, with a greatly extended period of preservation, and that local fish could be cured successfully.

Series of experimental packs of dry-salt fish were prepared in both St. Thomas and Puerto Rico. A method was developed, based on previous studies by the bureau on the salting of fish, by which a product equal to any imported dry-salt fish can be prepared from fish caught locally around these islands. Data obtained indicate that this fish will not spoil readily. It was found possible to utilize almost all of the larger food fish in the preparation of dry-salt fish, but dry-salt barracuda was found to be the best all-around product.

The disposal of smaller food fish is a problem to the local fishermen and dealers. The study indicated that smoking might be utilized for the curing of these smaller fish, and a product prepared for which there would be more demand. Several lots of fish were smoked by a method suited to local conditions.

Instruction was given to fishermen and others in the islands for the proper handling and icing of fresh fish, the preparation of dry-salt fish, the construction of a smokehouse and the preparation of smoked fish, all of which should lead to placing the fishing industry on a sounder basis.

## PRESERVATION OF FISHERY BY-PRODUCTS

In the fall of 1930, the bureau discontinued operation of its by-products laboratory at Reedville, Va., and installed larger and more complete equipment for by-products' studies as a part of the technological laboratory established at Gloucester, Mass. This move entailed the shipping of all equipment to Gloucester, the renovation of the new quarters, and the assembly and installation of the equipment shipped from Reedville as well as the assembly and installation of additional equipment for use in the new laboratory.

With the installation of the equipment in the Gloucester Laboratory, Roger W. Harrison assisted by Andrew W. Anderson and Samuel R. Pottinger initiated four major by-products investigations. These were: (1) A study of improved methods of manufacturing fish meal from nonoily fish waste, (2) a study designed to develop, from fillet waste, a fish flour which would be suitable for human consumption,

(3) a study of the chemical, physical, and biological constants of haddock-liver oil and, (4) a study designed to improve the technical usefulness of fish oils. Inasmuch as these investigations are studies of major importance and entail a great amount of experimental work over an extended period of time, it was not possible to bring any of them to completion during the few remaining months of the past year. Accordingly, the following may be considered only as a progress report of the work accomplished at the time of this writing.

### IMPROVED METHODS FOR MANUFACTURING FISH MEAL FROM NONOILY FISH WASTE

The increasing interest in the use of fish meal as an animal feedstuff makes it highly desirable for the industry to manufacture fish meal of high quality. Fish offal or waste is a perishable material composed of complex inorganic and organic compounds. These latter materials are subject to change during the process of manufacture, and it is, therefore, essential to understand such changes so that those which tend to lower the quality of the products as an animal feed can be eliminated. For this reason, the scope of the investigations on methods of manufacturing fish meal includes studies to determine effect of: (1) Temperature, (2) length of drying time, (3) type of heating medium, and (4) method of applying heat on, (*a*) the nutritive value, (*b*) the chemical composition, and (*c*) the appearance of the product.

In order to carry on the work it has been necessary to: (1) Develop experimental apparatus, (2) conduct tests on such apparatus, (3) test samples for biological value, and (4) make chemical analysis of the finished products.

The preliminary results obtained to date, while not sufficient to warrant conclusions, indicate that both temperature and length of drying time have a noticeable effect upon the quality of the product. That is, high drying temperatures and long drying periods, within certain limits, detract from the nutritional value of the meal. Inasmuch as the elimination of one ordinarily results in the magnification of the other much remains to be done in determining optimum operating conditions. The study of type of heating mediums and methods of applying heat may be expected to aid in the solution of this problem. The biological tests are being carried on in cooperation with the Ohio Agricultural Experiment Station at Wooster, Ohio.

### DEVELOPMENT OF FISH FLOUR SUITABLE FOR HUMAN CONSUMPTION

In the preparation of certain fish for market, as packaged products, a considerable quantity of material is accumulated which is suitable for human consumption. This material consists essentially of the backbones and the flesh adhering to them.

In view of recent studies in nutrition, this material constitutes an extremely valuable supplement to the human diet. Nutrition experts are showing the importance of certain mineral elements in the diet; and analysis of fish waste shows that these elements are found in relatively abundant proportion in this material ranging from 6 to 28 per cent of minerals. A flour prepared from the edible portion of fish trimmings, therefore, should prove a valuable food product.

The scope of the studies being made on the manufacture of this product include the development of a method of manufacture whereby: (1) The original nutritional value will be altered as little as possible, (2) the resultant product will stand up in color and taste during storage, and (3) the flour will lend itself to satisfactory inclusion in food recipes. Preliminary data indicate that these requisites can be realized more closely by an extremely rapid removal of moisture at relatively low temperatures.

The work accomplished during the latter part of the past year has consisted in the design and construction of an apparatus which will disperse the fish material in a drying medium in such a manner that extremely rapid drying can be effected. Preliminary studies on the nutritional value of this material have shown that different portions of the waste are more nutritious than others.

### HADDOCK-LIVER OIL

The increasing catch of haddock in the New England ground-fish fishery has made it imperative that more be known concerning the chemical nature and biological value of haddock-liver oil. This is especially true since it is believed by some that the present specifications for cod-liver oil, as stated in the United States Pharmacopœia, place the producers of haddock-liver oil at a distinct disadvantage; although the intention of the Pharmacopœia is to permit the use of haddock-liver oil along with cod-liver oil. At the present time but a very small portion of the domestic supply of fish livers is converted into oil, and any stimulation toward increased production of domestic liver oil would be of considerable service to the fishing industry.

The scope of the investigation now under way includes a study of the oil rendered from livers removed from haddock taken on all the important fishing grounds during an entire year. The data which are being correlated consist of: (1) Date of catch, (2) location of fishing ground, (3) color of oil, (4) specific gravity, (5) refractive index, (6) free fatty acid content, (7) unsaponifiable matter, (8) saponification number, (9) iodine number, and (10) vitamin potency.

The data obtained up to the present writing show that haddock-liver oil is subject to considerable variation with regard to some of its physical and chemical properties. Further, on the basis of the trend of these data, which includes the period from September to December, some of these properties during the warmer seasons may be expected to fall beyond the limits of the Pharmacopœia.

### IMPROVING THE TECHNICAL USEFULNESS OF DOMESTIC FISH OILS

One of the important problems facing the fish oil industry in this country is to find a better market for its output. In order to be of assistance to the fish oil industry in this connection, the bureau has undertaken a study to relieve this situation. The work on this problem at the present time is concerned with the natural variations in the properties of the oils from different sources; since one of the principal objections made by consumers of fish oils is their apparent lack of uniformity. On the basis of the data obtained it is hoped, as the first step, to be able to recommend when the various oils are most nearly fitted for the many uses which can be made of them.

## NET PRESERVATION

As a result of the bureau's work on net preservation conducted by W. T. Conn a method of protecting heavy nets, such as traps, pounds, fykes, and seines, from deterioration has been developed. This makes use of toxic dyes applied to the thread or net. When these are used in connection with a specification coal tar, the tensile strength of exposed cable cotton has been extended beyond a degree previously thought possible. Specifically, tensile strength of 15-thread cable cotton, so preserved, increased constantly in all tests, during the season of greatest deterioration, between June and December. Crystal violet is considered the best dye for this service, but malachite green and thioflavine-S have proven only slightly inferior. Sources of supply of this dyed twine are now established and are available for prospective buyers.

A study of tars used for preserving nets has shown that many tars are of an inferior quality for net preservation. With the aid of the above test and through developmental work with tar it has been possible to prepare a tar which has maximum preservative qualities. Specifications for this net preservative tar have been drawn up, for the first time as far as known, and supplies of this specification coal tar certified for quality by the manufacturer are now available to fishermen.

While the above application prevents deterioration and preserves tensile strength, it does not entirely eliminate weed growth on the net. It is possible to retard this weed growth or fouling by adding certain copper compounds to the coal tar dip applied to dyed twine. The reduction of fouling, however, is effected at some sacrifice to tensile strength.

Studies also were continued on developing formulæ for preserving light nets such as gill nets, trammel nets, and the like. As a result of this the value of copper oleate and chicle as preservatives, as previously reported, were confirmed. In addition, tung and pine oils were found to have value as preservatives for light nets.

While certain preservatives have been efficacious in prolonging the life of light nets, an investigation on gill nets fished by a vessel out of Portland, Me., during the summer of 1931, has shown that many nets in this type of fishery deteriorate because of improper cleansing and storage. This deterioration can be retarded to a great extent by washing the net with lime water as soon as possible after each fish haul, and rinsing with clear water. The net should be removed from the reel as soon as dry, as direct sun rays injure the dry fabrics. A boxed damp net should never be covered, and when nets are to be stored they should be thoroughly cleansed, dried, and suspended in dry, well-ventilated shade.

Information obtained during research upon the preservation of fish nets indicates that the useful life of rope may be extended with comparatively little expenditure of time and money. It is possible that the toxic dye treatment described above for fish nets may be of value in this connection. However, it has been demonstrated by laboratory test that the dye must be applied to the hemp before the yarn is laid. Experiments in this direction have been made possible through cooperative research between this bureau and the Bureau of Construction and Repair, Navy Department. Preparation of test material is in progress at the naval rope factory at Boston, Mass., under personal direction of a technologist from this bureau.

## MARKET AND INDUSTRIAL SURVEYS

Market and industrial surveys are made to supply the trade with useful market information regarding the distribution and consumption of fishery products and to supply descriptive and economic data on our fisheries and fishery industries.

### SOME UNUSUAL MARKETS FOR FISH AND SHELLFISH

During 1931 surveys were made of the methods of several unusual markets for fish and shellfish by F. F. Johnson. These included commercial sport fishing in privately stocked waters, hot-fish shops, clambakes, oyster roasts, oyster suppers, fish frys, etc.

The survey of commercial sport fishing covered 40 firms which it is estimated comprise 80 per cent of such firms in the United States. In addition, it covered 19 hatchery firms who indicated their intentions of opening commercials pools. Some of these latter firms already have pools under construction. The investment in sport fishing waters and in hatcheries operated by sport fishing concerns exceeded $500,000 during the fiscal year ended September 30, 1931. The species used in these enterprises were usually rainbow and brook trout although some firms reported that cutthroat trout, black bass, and bullheads were used. About 322,000 pounds of fish were taken by some 29,000 sport fishermen during the year. Customary charges for fishing varied from 65 cents to $1 per pound of fish taken.

It is estimated that sales through the hot-fish shops of Great Britain account for nearly 70 per cent of the fish landed in the country. The closest semblance to this type of trade in the United States is the hot-fish business in and around St. Louis, Mo. More than one-fourth of the total supply of whiting taken in the fisheries of the Middle and North Atlantic coasts are used in this trade. They are frozen shortly after capture near the fishing centers and usually reach the St. Louis markets in carload lots. The study of the development of the hot-fish trade in the St. Louis area has suggested the possibility of similar activities in other cities.

Clambakes and oyster roasts are old American institutions which have been borrowed from our aboriginal predecessors and celebrated by all our generations much after the traditional fashion. A discussion of the methods of these functions has been deemed advisable due to the general lack of detailed information concerning them.

The full report of these marketing phases as well as of other unusual markets is contained in Fishery Circular No. 11 entitled "Some Unusual Markets for Fish and Shellfish." It may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C.

### PUERTO RICO

Believing that the fishery resources of Puerto Rico were largely undeveloped and that methods for preserving and marketing fishery products in the island were inefficient, Gov. Theodore Roosevelt requested the Bureau of Fisheries to make an economic survey of the situation and to suggest procedures leading toward fuller development. In order to aid in this respect the bureau detailed N. D. Jarvis to undertake this work in cooperation with the Bureau of Commerce and Industry of Puerto Rico. The survey began on July 15 and was completed on November 19, 1931.

The results of the survey indicated that this belief was well founded. It was found that 87 per cent of all fishery products used was imported from other countries. The greater part of this was cod and other dry salt fish mostly from Nova Scotia and Newfoundland. The annual per capita consumption of fish is low as compared with near-by islands. This is about 14 pounds in the edible portion, as compared with a per capita consumption of 32 pounds in the near-by Virgin Islands. Fish are iced for shipment in only three localities. It is not the custom to use ice when retailing fish either while on display at retail stores and fish markets or in peddling in the streets and around the country.

Fish are not gutted, cleaned, or given anything approaching careful handling either by the fisherman or dealer. In addition, the native retail trade is reluctant to accept dressed fish. Gutting is believed to be a method of concealing inferiority. As a result much of the fish is stale, fresh fish is not sold in inland towns, and in comparatively small amounts along the coast. Consumption is decreased even where fish is available through fear of "fish poisoning." This is thought to be caused principally by eating stale or tainted fish.

While the catch may be increased somewhat on all sections of the coast, only two areas ar believed capable of producing catches much larger than those now taken. These are the grounds around the eastern and western ends of the island with Fajardo and Puerto Real as central points. These towns are even now the largest source of supply for San Juan, the principal market. Fish is shipped in metal-lined boxes by motor truck and is from four to nine hours on the road.

Sufficient supplies of raw material are apparently not available for the operation of a fish-reduction plant on a profitable basis.

Having concluded the market survey, the bureau's technologist remained on the island to develop methods for handling the catch. A résumé of this work is discussed on page 106 of this report.

## PUBLICATIONS OF THE DIVISION

During the calendar year 1931 the following publications were prepared by members of the division. This list does not include the monthly statistical bulletins of the landings of fishery products at Boston and Gloucester, Mass., Portland, Me., and Seattle, Wash., nor the monthly reports on cold-storage holdings of frozen fish and quantities of fish frozen. The fishery documents, reports, and circulars may be purchased at the prices shown from the Superintendent of Documents, Government Printing Office, Washington, D. C. The statistical bulletins and special or S-memoranda are distributed free of charge upon request to the bureau. The special articles may be obtained from the sources of publication.

Those wishing to receive current copies of this report and statistical bulletins issued by the bureau should request that their names be placed on the bureaus' mailing lists No. 128 for the annual statistical report, 128a for general statistical bulletins, and 128b for monthly cold-storage reports. Those desiring historical statistical data on the domestic fisheries for the period 1880 to 1929 should consult the report entitled "Fishery Industries of the United States, 1930," by R. H. Fiedler, Appendix II to the Report of the U. S. Commissioner of Fisheries for the fiscal year 1931.

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## DOCUMENTS, REPORTS, AND CIRCULARS

COBB, JOHN N.
Pacific salmon fisheries. 8°, 293 pp., 48 figs. Fishery Document No. 1092. 65 cents.

CONN, W. T.
Application of preservatives to fishing nets. 8°, 6 pp., 5 figs. Fishery Economic Circular No. 74. 5 cents.

DANIEL, ESTHER PETERSON, and E. V. MCCOLLUM.
Studies on the nutritive value of fish meals. 8°, 19 pp., 6 figs. Fishery Investigational Report No. 2. 5 cents.

FIEDLER, R. H.
Fishery industries of the United States, 1930. Appendix II, Report of Commissioner, 1931. 8°, 444 pp., 21 figs. 80 cents.

HARRISON, ROGER W.
The menhaden industry. 8°, 113 pp., 30 figs. Fishery Investigational Report No. 1. 25 cents.
Market for marine animal oils in the United States. 8°, 78 pp., 17 figs. Fishery Investigational Report No. 7. 15 cents.

HARRISON, ROGER W., and S. R. POTTINGER.
Commercial production of menhaden fish oil for animal feeding. 8°, 11 pp., 1 table. Fishery Investigational Report No. 4. 5 cents.

LEMON, J. M.
Market for fresh oysters in fourteen cities of the United States. 8°, 25 pp., 6 figs. Fishery Circular No. 3. 10 cents.

LUCAS, CLARENCE R.
Review of the fish-farming industries of the United States. 8°, 16 pp., 7 figs. Fishery Circular No. 2. 5 cents.

MANNING, JOHN RUEL, E. M. NELSON, and CHESTER D. TOLLE.
Vitamin D in menhaden fish oil. 8°, 5 pp., 1 fig. Fishery Investigational Report No. 3. 5 cents.

## SPECIAL ARTICLES

CONN, W. T.
Standard preservatives for fish nets. Commercial Standards Monthly. February, 1931. Washington.
Application of preservatives to fishing nets. Fish and Oyster Reporter. June, 1931. Tampa, Fla.
Net preservative research, 1926–1929. Technological Report No. 1, 1931. Available for reference only at the United States Bureau of Fisheries Library, Department of Commerce, Washington.
Net preservative research, 1930. Technological Report No. 2, 1931. Available for reference only at the United States Bureau of Fisheries Library, Department of Commerce, Washington.

FIEDLER, R. H.
Statistical research in the fisheries. Address before second statistical conference of the division of fishery industries. Washington, February 19, 1931. Published in United States Daily, March 26 and 27, 1931. Washington; Bureau of Fisheries Memorandum S–325, 1931. Washington.
Trade in fresh and frozen fishery products. Fish and Oyster Reporter. March, 1931. Tampa, Fla.
Fish supply of nation subject to investigation. Louisiana Conservation Review. May, 1931. New Orleans.
Progress in commercial fisheries. Address before Southern Fisheries Association. Jacksonville, Fla., June 10, 1930. Published in Fish and Oyster Reporter, June, 1930. Tampa, Fla.
The package fish trade. Fishing Gazette Annual Review number, June 15, 1931. New York.
How Federal bureau aids fishing industry. United States Daily, June 24, 1931. Washington. Louisiana Conservation Review, November, 1931. New Orleans.
Problems connected with freezing fish. United States Daily, June 25, 1931. Washington. Louisiana Conservation Review, October, 1931. New Orleans.
The growth of the packaged fish trade. Maryland Fisheries, No. 11, July, 1931. Baltimore.

FOGELBERG, JOHN M.
Deterioration of fish nets in fresh water. Technological Report No. 3, 1931. Available for reference only at the United States Bureau of Fisheries Library, Department of Commerce. Washington.

HARRISON, ROGER W.
Standards in the manufacture of fish meal. Commercial Standards Monthly, November, 1930. Washington.
Suggestions for storing fish oil. Fishing Gazette, January, 1931. New York.
Significance of recent rapid growth in whale oil production. Address before American Oil Chemists Society in Chicago, Ill., October 30, 1931. Published in Soap, November, 1931. New York. Bureau of Fisheries Special Memorandum 1721–23. Washington.

JARVIS, N. D.
The following articles were published in the Daily News at St. Thomas, Virgin Islands, 1931. Preservation of fish, June 19 and 22. Value of fish as food, June 24. Salting of fish, June 25. Smoking fish, June 27, Processes recommended for dry-salting fish in the Virgin Islands, July 13. Recommendations for handling fresh fish in the Virgin Islands, July 15.
The following articles were published in the Puerto Rico Progress, San Juan, Puerto Rico, 1931. Fisheries of Puerto Rico, August 27. Food value of fish, September 3.
The following articles were published in El Mundo (Spanish) San Juan, Puerto Rico, 1931. Problems affecting fisheries development in Puerto Rico, September 6. How to salt fish in Puerto Rico, October 29. How to build a smokehouse and smoke fish, November 1.
Observations on the fisheries of Puerto Rico. El Imparcial (Spanish), September, 1931. San Juan, Puerto Rico.

JOHNSON, F. F.
Compiling data on scope of fishing industry. United States Daily, September 12, 1931. Washington.
Statistics on production of canned fish. United States Daily, November 12, 1931. Washington.

LEMON, J. M.
Standards for refrigeration of fish. Commercial Standards Monthly, March, 1931. Washington. Ice and Refrigeration, April, 1931. Chicago. United States Daily, May 5, 1931. Washington.
Development of processes for preserving foods. United States Daily, November 13, 1931. Washington.

MANNING, JOHN RUEL.
Fish meal for poultry feeding. Poultry Success, January, 1931. Springfield, Ohio.
Seafoods yield iodine essential to balanced diet. Louisiana Conservation Review, January, 1931. New Orleans.
New dietary standards developed. Commercial Standards Monthly, January, 1931. Washington. Flour and Feed, February, 1931. Milwaukee.
Marine products in our national dietary. Address before District of Columbia Medical Society, Washington, D. C., March 11, 1931. Published in Bulletin of Medical Society of the District of Columbia, July, 1931. Washington. Bureau of Fisheries Special Memorandum 2468, Washington. Fish and Oyster Reporter, May, 1931. Tampa, Fla.
Seafood more important in diet as soil minerals are depleted. United States Daily, March 17, 1931. Washington.
Seafood said to furnish iodine in palatable form. United States Daily, March 21, 1931. Washington.
Discussion on diet and dentition. Address before the District of Columbia Dental Society, Washington, D. C. Published in the Dental Cosmos, April, 1931. Philadelphia.
Marine products a source of iodine. Flour and Feed, May, 1931. Milwaukee. The place of marine products in animal nutrition. Feedstuffs, May 30, 1931. Minneapolis.
Manufacture and uses of marine products with relation to animal nutrition. Address before American Feed Manufacturers' Association, French Lick Springs, Ind., June 5, 1931. Published in Feed Bag, June, 1931. Milwaukee. Feedstuffs, June 6, 1931. Minneapolis. Flour and Feed, July, 1931. Milwaukee. Bureau of Fisheries Special Memorandum 2255A. 1931. Washington.

MANNING, JOHN RUEL—Continued.
Analyzing food value of fishery products. United States Daily, September 14, 1931. Washington.
The relation of public institutions to public health and child welfare. Radio address over station WRC, Washington, D. C., October 12, 1931. Bureau of Fisheries Special Memorandum 2482, 1931. Washington.
TOLLE, CHESTER D.
Discussion on diet and dentition. Address before District of Columbia Dental Society, Washington, D. C. Published in The Dental Cosmos, April, 1931. Philadelphia.
TOLLE, CHESTER D., and E. M. NELSON.
Salmon oil and canned salmon as sources of vitamins A and D. Address before Division of Biological Chemistry, American Chemical Society, Indianapolis, Ind., April 1, 1931. Published in Industrial and Engineering Chemistry, September, 1931. Washington.

### STATISTICAL BULLETINS

Fisheries of the New England States, 1929. Statistical Bulletin No. 926.
Fisheries of the Middle Atlantic States, 1929. Statistical Bulletin No. 923.
Fisheries of the Chesapeake Bay States, 1929. Statistical Bulletin No. 908.
Fisheries of the South Atlantic and Gulf States, 1929. Statistical Bulletin No. 925.
Fisheries of the Pacific Coast States, 1929. Statistical Bulletin No. 930.
Lake fisheries, 1929. Statistical Bulletin No. 933.
Fisheries of the United States and Alaska, 1929. Statistical Bulletin No. 928.
Production of cured fishery products in the marine and lake sections of the United States and Alaska, 1929. Statistical Bulletin No. 932.
Canned fishery products and by-products of the United States and Alaska, 1930. Statistical Bulletin No. 927.
Production of fresh, frozen, and smoked packaged fishery products in the United States, 1930. Statistical Bulletin No. 924.
Fishery products frozen and cold-storage holdings of frozen and cured fishery products in the United States and Alaska, 1930. Statistical Bulletin No. 920.
Fisheries of Alaska, 1930. Statistical Bulletin No. 922.
Landings by fishing vessels at principal New England ports, 1930. By months. Statistical Bulletin No. 911.
Landings by fishing vessels at the three principal New England ports, 1930. By gear and fishing grounds. Statistical Bulletin No. 912.
Fishery products landed by United States vessels at Seattle, Wash., 1930. By banks. Statistical Bulletin No. 913.

## Part 2. FISHERY STATISTICS [3]

## REVIEW, 1930

### GENERAL

The catch of fishery products in the United States and Alaska during 1930 was slightly less than in the previous year. The value of the catch also decreased as compared with 1929. The value of the output of canned fishery products and by-products in 1930 decreased as did the production of packaged fish. The output of cured fishery products increased slightly in quantity in 1930 as compared with the previous year but decreased in value. The production of frozen fish increased over 1929, and both imports and exports of fishery products decreased as compared with 1929.

During 1930, the domestic fisheries employed about 120,000 persons as fishermen, 4,500 on transporting craft, and about 86,000 were en-

[3] With reference to the figures published in part 2 the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure" which gives in detail methods for collecting statistics, compilation practices and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

gaged in the wholesale and manufacturing industries, a total of 204,000 persons, exclusive of duplication. The catch amounted to 3,286,580,000 pounds, valued at $109,349,000.

In 1930, in the marine and lake sections of the United States and Alaska, the production of canned fishery products amounted to 577,783,000 pounds, valued at $83,015,000; and the output of by-products was valued at $19,560,000. The production of fresh and frozen packaged fishery products amounted to 157,378,000 pounds, valued at $28,996,000. The production of cured fishery products amounted to 124,497,000 pounds, valued at $16,837,000. The pack of frozen fishery products in the entire United States and Alaska amounted to 139,297,000 pounds, estimated to be valued at $16,500,000. In addition, it is estimated that $5,000,000 worth of fishery products were cured or manufactured into by-products in the Mississippi River and tributaries section during 1930—making the total value of all manufactured products in the entire United States and Alaska in 1930 about $170,000,000.

Fishery products imported for consumption were valued at $50,830,000, while domestic exports were valued at $17,276,000.

## NEW ENGLAND STATES

The most recent general statistics of these States, which are for 1930, show that the catch exceeded that in any year for which there are records, although the value of the catch was exceeded in 1929. The catch increased 1 per cent in quantity and decreased 5 per cent in value as compared with the catch and its value in the previous year. Larger catches of ground fish offset the considerable decrease in sea herring and mackerel. Landings of fish at Boston, Gloucester, and Portland were the largest on record during 1930, although the value of these fish was somewhat less than in the previous year.

The output of packaged fish registered a decline of 7 per cent as compared with that in 1929. The frozen fish trade shows a considerable increase in 1930 over the previous year. The production of sardines, which is the principal fish-canning industry in this section and is centered in Maine, showed a large decrease as compared with the previous year. The cured-fish industry decreased in volume as compared with 1929.

## MIDDLE ATLANTIC STATES

The catch of fishery products of the Middle Atlantic States in 1930 exceeded that in any year for which there are records. The value of the catch was slightly less than in 1929, the largest on record. The increased catch is due largely to the increase in volume of menhaden and alewives, while the decrease in value is due mainly to a smaller production in the oyster industry.

Landings of fish at New York City and Groton, Conn., which consisted largely of haddock, flounders, cod, mackerel, and tilefish, decreased considerably as compared with 1929. The packaged fish-trade decreased also, as did the trade in frozen fish. The catch of shad in the Hudson River increased slightly over 1929. The production of cured fish showed a considerable increase over the previous year.

## CHESAPEAKE BAY STATES

In 1930, the catch of fishery products of the Chesapeake Bay States exceeded that in the previous year. The value of the catch was slightly less. However, the catch was the smallest on record since 1888, with the exception of 1929. The decline in the volume of the menhaden catch has been largely responsible for this decrease in the total catch. The catch of shad in the Potomac River during 1930 was much less than that in 1929, but the catch of alewives increased slightly. The production of packaged fish was about the same as in 1929. The production of cured fish was considerably larger than during the previous year. The value of the production of menhaden products in 1930 was approximately the same as that in 1929.

## SOUTH ATLANTIC AND GULF STATES

Statistics of the fisheries of the South Atlantic and Gulf States for 1930 show a considerable decrease in the catch of fishery products and the value of the catch as compared with the previous year. This is due largely to decreases in the volume of the catch of menhaden, oysters, and shrimp. There was a considerable increase in the production of packaged fishery products as compared with 1929. The production of cured fishery products also was greater than during the previous year.

There were decreases in the production of canned oysters and shrimp as well as menhaden products. The manufacture of each of these products is an important industry in this section.

## PACIFIC COAST STATES

Statistics of the fisheries of the Pacific Coast States for 1930 show a decrease in the catch of fishery products and the value of the catch as compared with the previous year. This is due mainly to decreases in the volume of the catch of pilchards and salmon. The production of frozen fishery products was greater in 1930 than in 1929. The pack of cured fish decreased in 1930 as compared with the previous year. There was a decrease of 35 per cent in the pack of salmon in 1930 as compared with 1929, due to the smaller pack of humpback or pink salmon, as 1930 was the "off year" for these species. Compared with the pack in 1928, the previous "off year," there was an increase of 25 per cent in the pack. There was a decrease in the pack of sardines in 1930, but an increase of 34 per cent in the pack of tuna and tunalike fishes as compared with 1929. The landings of the halibut fleet in 1930 decreased somewhat from those in the previous year.

## LAKE FISHERIES

The United States fisheries prosecuted in the Great Lakes and the International Lakes of northern Minnesota show an increase in the volume of the catch in 1930 as compared with the previous year, and a slight decrease in the value of the catch. A large increase in the catch of blue pike was responsible mainly for the increase in the catch. Beginning in 1929, a revised statistical procedure was used, incorporating the inclusion of certain products not canvassed in recent surveys, and a change in the methods of collecting statistics

in some of the States. The catch of cisco, although much greater than in 1929, is still far below the volume once attained as an important product of the fisheries of Lake Erie. The production of cured fishery products increased as compared with 1929.

## MISSISSIPPI RIVER AND TRIBUTARIES

No general survey of the fisheries of Mississippi region has been made since 1922, and therefore no recent trend can be determined. The yield of fresh-water mussels, which contributed approximately one-half to the total weight of the catch in 1922, shows an increase in 1930, not only over the production of 1922, but also that of 1929. The fisheries of Lake Pepin and Keokuk decreased in volume and value as compared with the previous year, but the catch and its value in the Mississippi River between these two lakes increased in 1930.

## ALASKA

The catch of fishery products of Alaska in 1930 was somewhat less than during the previous year, and the value of the catch was considerably less. There was a decrease in the pack of salmon amounting to 6 per cent as compared with the pack in 1929. The catch of herring as well as that of halibut was somewhat less than in the previous year. There was an increase in the frozen fish and cured fish production over 1929.

*Fisheries of the United States and Alaska, 1930* [1]

SUMMARY OF CATCH: BY SECTIONS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Product | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Fish | 645,574 | 19,232 | 131,638 | 3,588 | 199,327 | 4,391 | 301,218 | 5,278 | 806,754 | 21,303 |
| Shellfish, etc | 55,777 | 8,261 | 62,230 | 9,476 | 117,066 | 7,081 | 116,541 | 5,787 | 22,790 | 1,594 |
| Whale products | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 3,844 | 167 |
| Total | 701,351 | 27,493 | 193,868 | 13,064 | 316,393 | 11,472 | 417,759 | 11,065 | 833,388 | 23,064 |

| Product | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* | *Quantity* | *Value* |
| Fish | 89,612 | 5,875 | 53,466 | 3,310 | 609,305 | 12,178 | 2,836,894 | 75,155 |
| Shellfish, etc | 5,336 | 175 | 54,705 | 1,075 | 1,980 | 108 | 436,425 | 33,557 |
| Whale products | -------- | -------- | -------- | -------- | 9,417 | 470 | 13,261 | 637 |
| Total | 94,948 | 6,050 | 108,171 | 4,385 | 620,702 | 12,756 | 3,286,580 | 109,349 |

[1] All figures are for 1930, except those for the Mississippi River and tributaries. In this section the figures on the catch of mussels are for 1930 and other figures are for 1922.

*Fisheries of the United States and Alaska, 1930*—Continued

OPERATING UNITS: BY SECTIONS

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf [2] |
|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6, 192 | 4, 665 | 2, 579 | 3, 454 |
| On boats and shore | 10, 885 | 5, 940 | 16, 812 | 20, 136 |
| Total | 17, 077 | 10, 605 | 19, 391 | 23, 590 |
| Vessels: | | | | |
| Steam | 64 | 15 | 25 | 3 |
| Net tonnage | 9, 033 | 1, 940 | 2, 902 | 166 |
| Motor | 649 | 463 | 87 | 589 |
| Net tonnage | 18, 583 | 6, 998 | 1, 453 | 9, 255 |
| Sail | 5 | 97 | 279 | 78 |
| Net tonnage | 50 | 2, 306 | 3, 015 | 1, 224 |
| Total vessels | 718 | 575 | 391 | 670 |
| Total net tonnage | 27, 666 | 11, 244 | 7, 370 | 10, 645 |
| Boats: | | | | |
| Motor | 4, 688 | 2, 014 | 8, 217 | 5, 950 |
| Other | 4, 099 | 2, 036 | 5, 603 | 8, 565 |
| Apparatus: | | | | |
| Haul seines | 147 | 341 | 375 | 1, 211 |
| Purse seines | 185 | 37 | 49 | 78 |
| Otter trawls (including all types and sizes) | 565 | 180 | 12 | 2, 306 |
| Gill nets | 13, 524 | 3, 570 | 19, 989 | 18, 100 |
| Trammel nets | | | | 449 |
| Pound nets, trap nets, and weirs | 542 | 758 | 2, 954 | 2, 399 |
| Stop nets | | 87 | 6 | |
| Fyke nets | 258 | 4, 534 | 3, 472 | 3, 976 |
| Bag nets and pocket nets | 182 | | | |
| Other nets [4] | 235 | 359 | 2, 108 | 2, 420 |
| Hooks, baits, or snoods | 4, 686, 790 | 794, 602 | 1, 642, 961 | 358, 692 |
| Fish wheels | | | | 50 |
| Eel pots and traps | 5, 045 | 10, 465 | 13, 292 | 1, 592 |
| Lobster pots | 332, 791 | 51, 946 | | |
| Crab and crawfish pots, traps, drags, etc | 3, 530 | 58 | | 3, 946 |
| Clam dredges | 84 | 82 | | 73 |
| Crab dredges | | 53 | 102 | 80 |
| Mussel dredges | | 8 | | |
| Oyster dredges | 300 | 674 | 966 | 720 |
| Scallop dredges and drags | 3, 522 | 1, 219 | 924 | 330 |
| Crab scrapes | | | 1, 850 | |
| Tongs, rakes, hoes, forks, grabs, etc | 4, 443 | 3, 230 | 11, 236 | 3, 836 |
| Sponge apparatus | | | | 338 |
| Other apparatus [6] | 2, 442 | 259 | 18 | 2, 942 |

| Item | Pacific | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6, 165 | 1, 660 | | [3] 10, 189 | 34, 904 |
| On boats and shore | 13, 409 | 5, 320 | 12, 310 | | 84, 812 |
| Total | 19, 574 | 6, 980 | 12, 310 | 10, 189 | 119, 716 |
| Vessels: | | | | | |
| Steam | 6 | 107 | | 8 | 228 |
| Net tonnage | 182 | 2, 374 | | 617 | 17, 214 |
| Motor | 849 | 360 | | 682 | 3, 679 |
| Net tonnage | 21, 609 | 3, 726 | | 11, 608 | 73, 232 |
| Sail | 8 | | | | 467 |
| Net tonnage | 3, 140 | | | | 9, 735 |
| Total vessels | 863 | 467 | | 690 | 4, 374 |
| Total net tonnage | 24, 931 | 6, 100 | | 12, 225 | 100, 181 |

[2] Includes the operating units used in the fisheries of Lake Okeechobee, Fla.
[3] Includes persons in boat and shore fisheries.
[4] Includes dip nets, cast nets, scap nets, reef nets, and other minor nets.
[6] Includes box traps, wire baskets, harpoons, spears, gaffs, crab and crawfish hooks, periwinkle and cockle pots, and other apparatus not included in "Other nets."

*Fisheries of the United States and Alaska, 1930*—Continued

OPERATING UNITS: BY SECTIONS—Continued

| Item | Pacific | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 5,942 | 2,215 | 4,597 | 1,814 | 35,437 |
| Other | 1,614 | 1,664 | 10,941 | 3,439 | 37,961 |
| Apparatus: | | | | | |
| Haul seines | 212 | 243 | 708 | 189 | 3,426 |
| Purse seines | 395 | | | 703 | 1,447 |
| Lampara nets | 241 | | | | 241 |
| Otter trawls (including all types and sizes) | | | | | 3,063 |
| Beam trawls | 55 | | | 9 | 64 |
| Paranzella nets | 16 | | | | 16 |
| Gill nets | 5,108 | 93,542 | 866 | 5,290 | 159,989 |
| Trammel nets | 61 | 94 | 459 | | 1,063 |
| Pound nets, trap nets, and weirs | 670 | 7,947 | 11 | 708 | 15,989 |
| Stop nets | | | | | 93 |
| Fyke nets | 2,102 | 2,515 | 49,652 | | 66,509 |
| Bag nets and pocket nets | 69 | | | | 251 |
| Other nets [4] | 389 | 27 | | | 5,538 |
| Hooks, baits, or snoods | 1,196,533 | 828,571 | (5) | (5) | 9,508,149 |
| Fish wheels | 39 | | | 266 | 355 |
| Eel pots and traps | | | | | 30,394 |
| Lobster pots | | | | | 384,737 |
| Shrimp nets and traps | | | 4,360 | | 4,360 |
| Crab and crawfish pots, traps, drags, etc | 18,034 | 5,418 | | 620 | 32,206 |
| Clam dredges | | | | | 239 |
| Crab dredges | | | | | 235 |
| Mussel dredges | | | | | 8 |
| Oyster dredges | | | | | 2,660 |
| Scallop dredges and drags | | | | | 5,995 |
| Crab scrapes | | | | | 1,850 |
| Tongs, rakes, hoes, forks, grabs, etc | 3,479 | 804 | 1,810 | | 28,838 |
| Crowfoot bars (pairs) | | 285 | 3,490 | | 3,775 |
| Abalone outfits | 13 | | | | 13 |
| Sponge apparatus | | | | | 338 |
| Other apparatus [6] | 4,592 | | (5) | | 10,253 |

CATCH: BY SECTIONS [7]

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf [8] | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH | | | | | | | | | | |
| Alewives | 4,106 | 37 | 5,292 | 36 | 21,128 | 268 | 10,207 | 74 | | |
| Amberjack | | | | | | | 21 | 1 | | |
| Anchovies | | | | | | | | | 320 | 4 |
| Barracuda | | | | | | | | | 4,764 | 379 |
| Black bass | | | | | 19 | 3 | 440 | 47 | | |
| Bluefish | 705 | 83 | 3,814 | 393 | 498 | 42 | 2,038 | 110 | | |
| Blue runner or hardtail | | | | | | | 756 | 14 | | |
| Bonito | 140 | 11 | 417 | 27 | 49 | 3 | 20 | (9) | | |
| Bowfin | | | | | | | 19 | 1 | | |
| Buffalofish | | | | | | | 116 | 6 | | |
| Butterfish | 1,905 | 140 | 3,137 | 237 | 4,201 | 201 | 183 | 4 | | |
| Cabio or crab-eater | | | | | (9) | (9) | 14 | 1 | | |
| Cabrilla | | | | | | | | | 510 | 27 |
| Carp | 21 | 2 | 358 | 45 | 469 | 34 | 470 | 32 | 284 | 8 |

[4] Includes dip nets, cast nets, scap nets, reef nets, and other minor nets.
[5] Number not determined.
[6] Includes box traps, wire baskets, harpoons, spears, gaffs, crab and crawfish hooks, periwinkle and cockle pots, and other apparatus not included in "Other nets."
[7] Salt fish have been converted to the basis of round weight.
[8] Includes the catch of fish taken in Lake Okeechobee, Fla.
[9] Less than 500 pounds or $500.

NOTE.—Whaling apparatus, the number of which was not determined, was used in the Pacific Coast States and Alaska.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH—continued | | | | | | | | | | |
| Catfish and bullheads | 118 | 3 | 94 | 10 | 807 | 35 | 5,376 | 237 | 433 | 58 |
| Cero | | | 20 | 2 | | | 19 | 1 | | |
| Cigarfish | | | | | | | 58 | 2 | | |
| Cod | 101,632 | 3,043 | 10,679 | 335 | 50 | 1 | 1 | (9) | 19,236 | 302 |
| Crappie | | | | | | | 900 | 34 | | |
| Crevalle | | | | | | | 103 | 3 | | |
| Croaker | 151 | 6 | 2,890 | 87 | 22,022 | 525 | 5,270 | 82 | | |
| Cunner | 106 | 3 | | | | | | | | |
| Cusk | 6,140 | 133 | 8 | (9) | | | | | | |
| Dolly Varden trout | | | | | | | | | 2 | (9) |
| Dolphin | (9) | (9) | 1 | (9) | | | 5 | 1 | | |
| Drum: | | | | | | | | | | |
| Black | | | 7 | (9) | 64 | 1 | 1,287 | 43 | | |
| Red or redfish | | | 65 | 12 | 52 | 2 | 2,616 | 148 | | |
| Eels | 1,355 | 132 | 1,272 | 147 | 389 | 34 | 159 | 12 | (9) | (9) |
| Flounders | 49,166 | 1,863 | 9,559 | 374 | 662 | 31 | 696 | 44 | 13,415 | 846 |
| Flyingfish | | | | | | | | | 48 | 2 |
| Frigate mackerel | 385 | 18 | | | | | | | | |
| Garfish | | | | | | | 1 | (9) | | |
| Gizzard shad | | | 1 | (9) | 168 | 4 | 39 | 1 | | |
| Goldfish | | | | | 13 | 1 | | | | |
| Goosefish | (9) | (9) | 38 | 1 | | | | | | |
| Grayfish | 93 | 3 | 13 | (9) | | | | | 1,018 | 13 |
| Groupers | | | | | | | 3,346 | 101 | | |
| Grunts | | | (9) | (9) | | | 48 | 2 | | |
| Haddock | 264,549 | 8,531 | 2,574 | 77 | | | | | | |
| Hagfish | | | 7 | (9) | | | | | | |
| Hake | 32,206 | 557 | 366 | 6 | 1 | (9) | | | 56 | 1 |
| Halfmoon | | | | | | | | | 37 | 3 |
| Halibut | 3,167 | 497 | 5 | 1 | | | | | 13,546 | 1,631 |
| Hardhead | | | | | | | | | 39 | 5 |
| Harvestfish or "starfish" | | | | | (9) | (9) | 343 | 10 | | |
| Herring, sea | 82,901 | 503 | 692 | 7 | | | | | 1,377 | 13 |
| Hickory shad | 4 | (9) | | | 90 | 3 | 387 | 17 | | |
| Hogfish | | | | | | | 2 | (9) | | |
| Horse mackerel | | | | | | | | | 369 | 11 |
| Jewfish | | | | | | | 44 | 1 | | |
| Kingfish (California) | | | | | | | | | 457 | 11 |
| Kingfish or "king mackerel" | | | | | | | 3,689 | 175 | | |
| King whiting or "kingfish" | (9) | (9) | 86 | 9 | 5 | (9) | 583 | 24 | | |
| Launce | 183 | 4 | | | | | | | | |
| "Lingcod" | | | | | | | | | 2,503 | 98 |
| Mackerel | 50,701 | 1,768 | 1,120 | 46 | 49 | 5 | | | 16,531 | 242 |
| Menhaden | 1,708 | 17 | 52,478 | 368 | 115,842 | 767 | 199,167 | 806 | | |
| Minnows | 36 | 4 | 166 | 5 | | | | | | |
| Mojarro | | | | | | | 81 | 3 | | |
| Mullet | 8 | (9) | 65 | 4 | 115 | 5 | 28,021 | 910 | 21 | 2 |
| Mummichog | 7 | 1 | 126 | 9 | | | | | | |
| Muttonfish | | | | | | | 225 | 15 | | |
| Paddlefish | | | | | | | 2 | (9) | | |
| Permit | | | | | | | 15 | (9) | | |
| Pigfish | | | | | 69 | 3 | 157 | 3 | | |
| Pike or pickerel | (9) | (9) | 1 | (9) | 11 | 2 | 10 | 1 | | |
| Pilchard | | | | | | | | | 494,451 | 2,377 |
| Pilotfish | | | 2 | (9) | | | | | | |
| Pinfish | | | | | | | 112 | 2 | | |
| Pollock | 17,820 | 306 | 114 | 3 | | | | | | |
| Pompano | | | | | 2 | (9) | 602 | 117 | 2 | 1 |
| Porgies | | | | | | | 56 | 2 | | |
| Porkfish | | | | | | | 1 | (9) | | |
| Rock bass | | | | | | | | | 508 | 32 |
| Rockfishes | | | | | | | | | 7,969 | 309 |
| Rosefish | 117 | 2 | 1 | (9) | | | | | | |
| Sablefish | | | | | | | | | 4,332 | 182 |

[9] Less than 500 pounds or $500.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH—continued | | | | | | | | | | |
| Salmon: | | | | | | | | | | |
| Atlantic | 88 | 27 | | | | | | | | |
| Blueback, red or sockeye | | | | | | | | | 25,103 | 2,404 |
| Chinook or king | | | | | | | | | 37,843 | 4,153 |
| Chum or keta | | | | | | | | | 12,668 | 117 |
| Humpback or pink | | | | | | | | | 272 | 8 |
| Silver or coho | | | | | | | | | 23,729 | 1,299 |
| Sculpin | | | | | | | | | 90 | 9 |
| Scup | 2,723 | 118 | 8,681 | 217 | 464 | 23 | | | | |
| Sea bass | 192 | 14 | 3,886 | 161 | 212 | 16 | 442 | 29 | 394 | 20 |
| Sea bass, white (California) | | | | | | | | | 1,626 | 144 |
| Sea robin | 235 | 3 | 132 | 2 | 1 | (9) | | | | |
| Shad | 201 | 16 | 450 | 82 | 7,181 | 1,139 | 2,541 | 426 | 3,043 | 82 |
| Sharks | 103 | 2 | 177 | 4 | | | 2,497 | 5 | | |
| Sheepshead, salt-water | | | | | | | 1,077 | 41 | 244 | 9 |
| Silversides | | | 260 | 12 | | | | | | |
| Skates | 1,016 | 10 | 269 | 5 | 3 | (9) | 1 | (9) | 288 | 6 |
| Skipper | 6 | 1 | | | | | | | | |
| Smelt | 796 | 141 | 3 | 1 | | | | | 3,392 | 117 |
| Snapper: | | | | | | | | | | |
| Mangrove | | | | | | | 125 | 5 | | |
| Red | | | 4 | (9) | | | 7,113 | 595 | | |
| Snook | | | | | | | 408 | 14 | | |
| Spadefish | | | | | | | 50 | 1 | | |
| Spanish mackerel | | | 16 | 1 | 58 | 7 | 6,355 | 311 | 43 | 2 |
| Spearfish | (9) | (9) | | | | | | | | |
| Split-tail | | | | | | | | | 19 | 1 |
| Spot | | | 693 | 31 | 2,619 | 132 | 2,521 | 44 | | |
| Squawfish | | | | | | | | | 5 | (9) |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | 186 | 19 | 13,272 | 466 | 19,266 | 753 | 3,396 | 142 | | |
| Spotted | 1 | (9) | | | 202 | 24 | 5,206 | 443 | | |
| Squirrelfish | | | | | | | 1 | (9) | | |
| Steelhead trout | | | | | | | | | 3,954 | 331 |
| Striped bass | 89 | 17 | 205 | 40 | 1,653 | 271 | 457 | 61 | 882 | 92 |
| Sturgeon and sturgeon roe | 9 | 1 | 22 | 9 | 5 | 1 | 32 | 6 | 142 | 6 |
| Suckers | 113 | 8 | 79 | 8 | | | 16 | 1 | 2 | (9) |
| Sunfish | | | 2 | (9) | | | 443 | 13 | | |
| Surf fishes | | | | | | | | | 371 | 15 |
| Swordfish | 5,135 | 876 | 234 | 38 | | | | | 563 | 75 |
| Tautog | 555 | 32 | 338 | 15 | 1 | (9) | | | | |
| Tenpounder | | | | | | | 191 | 6 | | |
| Thimble-eyed mackerel | | | 36 | 1 | | | | | | |
| Tilefish | 1,783 | 97 | 2,312 | 89 | | | | | | |
| Tomcod | 74 | 1 | 121 | 5 | (9) | (9) | | | 23 | 1 |
| Tripletail | | | | | | | 13 | 1 | | |
| Tuna and tunalike fishes: | | | | | | | | | | |
| Albacore | | | | | | | | | 286 | 24 |
| Bluefin | | | | | | | | | 21,921 | 1,238 |
| Bonito | | | | | | | | | 5,164 | 167 |
| Skipjack or striped | | | | | | | | | 20,486 | 790 |
| Yellowfin | | | | | | | | | 56,654 | 3,396 |
| Horse mackerel | 274 | 15 | 148 | 7 | | | | | | |
| Turbot | | | | | | | 1 | (9) | | |
| Whitebait | | | 96 | 7 | | | | | 179 | 12 |
| Whitefish | | | | | | | | | 225 | 13 |
| White perch | 50 | 5 | 380 | 56 | 616 | 41 | 442 | 33 | | |
| Whiting | 9,863 | 108 | 4,113 | 70 | 27 | 1 | | | | |
| Wolffish | 2,651 | 54 | 6 | (9) | | | | | | |

[9] Less than 500 pounds or $500.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | New England | | Middle Atlantic | | Chesapeake | | South Atlantic and Gulf | | Pacific | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH—continued | | | | | | | | | | |
| Yellow perch | 1 | (9) | 232 | 20 | 154 | 13 | 96 | 7 | | |
| Yellowtail | | | 3 | (9) | | | 89 | 7 | 4,771 | 210 |
| Miscellaneous fish | | | | | | | | | 144 | 5 |
| Total | 645,574 | 19,232 | 131,638 | 3,588 | 199,327 | 4,391 | 301,218 | 5,278 | 806,754 | 21,303 |
| SHELLFISH, ETC. | | | | | | | | | | |
| Abalone | | | | | | | | | 647 | 130 |
| Clams: | | | | | | | | | | |
| Cockle | 29 | 5 | | | | | | | 30 | 10 |
| Hard | 3,822 | 858 | 2,577 | 1,055 | 1,294 | 432 | 1,042 | 89 | 515 | 38 |
| Pismo | | | | | | | | | 22 | 10 |
| Razor | 380 | 20 | 3 | 1 | | | | | 838 | 159 |
| Soft | 13,299 | 644 | 1,131 | 158 | | | | | 62 | 11 |
| Surf | 38 | 4 | 423 | 50 | | | | | | |
| Mixed | | | | | | | | | 5 | 1 |
| Conchs | | | 35 | 3 | | | 20 | (9) | | |
| Crabs: | | | | | | | | | | |
| Hard | 1,952 | 129 | 417 | 29 | 60,565 | 1,072 | 6,493 | 105 | 4,540 | 399 |
| King | | | 6,184 | 29 | | | | | | |
| Rock | | | 1 | (9) | | | | | | |
| Soft | | | 135 | 22 | 8,194 | 650 | 531 | 117 | | |
| Stone | | | | | | | 308 | 27 | | |
| Crawfish | | | | | | | | | 177 | 18 |
| Lobsters: | | | | | | | | | | |
| Common | 12,357 | 3,218 | 1,559 | 369 | | | | | | |
| Spiny | | | | | | | 288 | 27 | 1,394 | 263 |
| Mussels, sea | 11 | 2 | 295 | 14 | | | | | (9) | (9) |
| Octopus | | | | | | | 4 | (9) | 163 | 11 |
| Oysters: | | | | | | | | | | |
| Eastern, market, public | 46 | 11 | 342 | 45 | 21,648 | 2,569 | 13,341 | 835 | | |
| Eastern, market, private | 9,386 | 1,736 | 21,175 | 4,032 | 15,076 | 1,783 | 5,243 | 581 | 75 | 31 |
| Eastern, seed, public | 1,362 | 168 | 19,773 | 2,520 | 8,235 | 417 | | | | |
| Eastern, seed, private | 4,685 | 682 | 4,037 | 554 | | | | | | |
| Western, market | | | | | | | | | 316 | 259 |
| Japanese, market | | | | | | | | | 228 | 83 |
| Periwinkle | 330 | 39 | | | | | | | | |
| Scallops: | | | | | | | | | | |
| Bay | 1,529 | 437 | 397 | 115 | 1,825 | 148 | 454 | 56 | 12 | 4 |
| Sea | 947 | 186 | 1,503 | 264 | | | | | | |
| Shrimp | 5 | 4 | 341 | 29 | | | 88,117 | 2,995 | 2,785 | 49 |
| Squid | 5,506 | 112 | 1,773 | 55 | 225 | 8 | | | 10,980 | 118 |
| Terrapin | | | 6 | 7 | 2 | 2 | 67 | 21 | (9) | (9) |
| Turtles | | | 11 | 1 | 2 | (9) | 84 | 3 | 1 | (9) |
| Irish moss | 93 | 6 | | | | | | | | |
| Sponges | | | | | | | 549 | 931 | | |
| Bloodworms | | | 54 | 63 | | | | | | |
| Sandworms | | | 58 | 61 | | | | | | |
| Total | 55,777 | 8,261 | 62,230 | 9,476 | 117,066 | 7,081 | 116,541 | 5,787 | 22,790 | 1,594 |
| WHALE PRODUCTS [10] | | | | | | | | | | |
| Oil, whale | | | | | | | | | 3,844 | 167 |
| Total | | | | | | | | | 3,844 | 167 |
| Grand total | 701,351 | 27,493 | 193,868 | 13,064 | 316,393 | 11,472 | 417,759 | 11,065 | 833,388 | 23,064 |

[9] Less than 500 pounds or $500.

[10] The weight of whales caught was not determined; therefore, the weight of the manufactured product is shown.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH | | | | | | | | |
| Alewives | | | | | | | 40,733 | 415 |
| Amberjack | | | | | | | 21 | 1 |
| Anchovies | | | | | | | 320 | 4 |
| Barracuda | | | | | | | 4,764 | 379 |
| Black bass | | | 74 | 11 | | | 533 | 61 |
| Bluefish | | | | | | | 7,055 | 628 |
| Blue pike | 11,823 | 568 | | | | | 11,823 | 568 |
| Blue runner or hardtail | | | | | | | 756 | 14 |
| Bonito | | | | | | | 626 | 41 |
| Bowfin | 19 | (9) | 190 | 6 | | | 228 | 7 |
| Buffalofish | 1 | (9) | 17,267 | 1,014 | | | 17,384 | 1,020 |
| Butterfish | | | | | | | 9,516 | 582 |
| Burbot | 642 | 17 | | | | | 642 | 17 |
| Cabio or crab-eater | | | | | | | 14 | 1 |
| Cabrilla | | | | | | | 510 | 27 |
| Carp | 3,293 | 106 | 18,338 | 872 | | | 23,233 | 1,099 |
| Catfish and bullheads | 641 | 43 | 8,093 | 714 | | | 15,562 | 1,100 |
| Cero | | | | | | | 39 | 3 |
| Chubs | 6,162 | 469 | | | | | 6,162 | 469 |
| Cigarfish | | | | | | | 58 | 2 |
| Cisco | 347 | 40 | | | | | 347 | 40 |
| Cod | | | | | 914 | 6 | 132,512 | 3,687 |
| Crappie | 4 | 1 | 512 | 49 | | | 1,416 | 84 |
| Crevalle | | | | | | | 103 | 3 |
| Croaker | | | | | | | 30,333 | 700 |
| Cunner | | | | | | | 106 | 3 |
| Cusk | | | | | | | 6,148 | 133 |
| Dolly Varden trout | | | | | 92 | 9 | 94 | 9 |
| Dolphin | | | | | | | 6 | 1 |
| Drum: | | | | | | | | |
| Black | | | | | | | 1,358 | 44 |
| Red or redfish | | | | | | | 2,733 | 162 |
| Eels | 5 | (9) | 16 | 1 | | | 3,196 | 326 |
| Flounders | | | | | 327 | 8 | 73,825 | 3,166 |
| Flyingfish | | | | | | | 48 | 2 |
| Frigate mackerel | | | | | | | 385 | 18 |
| Garfish | | | | | | | 1 | (9) |
| Gizzard shad | | | | | | | 208 | 5 |
| Goldeye | (9) | (9) | | | | | (9) | (9) |
| Goldfish | 64 | 1 | | | | | 77 | 2 |
| Goosefish | | | | | | | 38 | 1 |
| Grayfish | | | | | | | 1,124 | 16 |
| Groupers | | | | | | | 3,346 | 101 |
| Grunts | | | | | | | 48 | 2 |
| Haddock | | | | | | | 267,123 | 8,608 |
| Hagfish | | | | | | | 7 | (9) |
| Hake | | | | | | | 32,629 | 564 |
| Halfmoon | | | | | | | 37 | 3 |
| Halibut | | | | | 35,063 | 2,991 | 51,781 | 5,120 |
| Hardhead | | | | | | | 39 | 5 |
| Harvestfish or "starfish" | | | | | | | 343 | 10 |
| Herring: | | | | | | | | |
| Sea | | | | | 145,672 | 1,093 | 230,642 | 1,616 |
| Lake | 22,482 | 519 | | | | | 22,482 | 519 |
| Hickory shad | | | | | | | 481 | 20 |
| Hogfish | | | | | | | 2 | (9) |
| Horse mackerel | | | | | | | 369 | 11 |
| Jewfish | | | | | | | 44 | 1 |
| Kingfish (California) | | | | | | | 457 | 11 |
| Kingfish or "king mackerel" | | | | | | | 3,689 | 175 |
| King whiting or "kingfish" | | | | | | | 674 | 33 |
| Lake trout | 9,497 | 1,175 | | | | | 9,497 | 1,175 |
| Launce | | | | | | | 183 | 4 |
| "Lingcod" | | | | | 35 | 1 | 2,538 | 99 |
| Mackerel | | | | | | | 68,401 | 2,061 |
| Menhaden | | | | | | | 369,195 | 1,958 |
| Minnows | (9) | (9) | | | | | 202 | 9 |
| Mojarro | | | | | | | 81 | 3 |
| Mooneye | 36 | (9) | 3 | (9) | | | 39 | (9) |

[9] Less than 500 pounds or $500.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH—continued | | | | | | | | |
| Mullet | | | | | | | 28,230 | 921 |
| Mummichog | | | | | | | 133 | 10 |
| Muttonfish | | | | | | | 225 | 15 |
| Paddlefish | | | 1,411 | 162 | | | 1,413 | 162 |
| Permit | | | | | | | 15 | (9) |
| Pigfish | | | | | | | 226 | 6 |
| Pike or pickerel | | | | | | | 22 | 3 |
| Pike (jacks) | 525 | 38 | 20 | 2 | | | 545 | 40 |
| Pilchard | | | | | | | 494,451 | 2,377 |
| Pilotfish | | | | | | | 2 | (9) |
| Pinfish | | | | | | | 112 | 2 |
| Pollock | | | | | | | 17,934 | 309 |
| Pompano | | | | | | | 606 | 118 |
| Porgies | | | | | | | 56 | 2 |
| Porkfish | | | | | | | 1 | (9) |
| Quillback | | | 765 | 59 | | | 765 | 59 |
| Rock bass | 17 | 1 | 3 | (9) | | | 528 | 33 |
| Rockfishes | | | | | 9 | (9) | 7,978 | 309 |
| Rosefish | | | | | | | 118 | 2 |
| Sablefish | | | | | 661 | 21 | 4,993 | 203 |
| Salmon: | | | | | | | | |
| Atlantic | | | | | | | 88 | 27 |
| Blueback, red or sockeye | | | | | 76,339 | 2,742 | 101,442 | 5,146 |
| Chinook or king | | | | | 17,553 | 521 | 55,396 | 4,674 |
| Chum or keta | | | | | 59,587 | 581 | 72,255 | 698 |
| Humpback or pink | | | | | 241,616 | 3,404 | 241,888 | 3,412 |
| Silver or coho | | | | | 31,347 | 793 | 55,076 | 2,092 |
| Sauger pike | 1,831 | 95 | 5 | 1 | | | 1,836 | 96 |
| Sculpin | | | | | | | 90 | 9 |
| Scup | | | | | | | 11,868 | 358 |
| Sea bass | | | | | | | 5,126 | 240 |
| Sea bass, white (California) | | | | | | | 1,626 | 144 |
| Sea robin | | | | | | | 368 | 5 |
| Shad | | | | | | | 13,416 | 1,745 |
| Sharks | | | | | | | 2,777 | 11 |
| Sheepshead: | | | | | | | | |
| Salt-water | | | | | | | 1,321 | 50 |
| Fresh-water | 2,909 | 88 | 5,261 | 290 | | | 8,170 | 378 |
| Silversides | | | | | | | 260 | 12 |
| Skates | | | | | | | 1,577 | 21 |
| Skipper | | | | | | | 6 | 1 |
| Smelt | (9) | (9) | | | 57 | 5 | 4,248 | 264 |
| Snapper: | | | | | | | | |
| Mangrove | | | | | | | 125 | 5 |
| Red | | | | | | | 7,117 | 595 |
| Snook | | | | | | | 408 | 14 |
| Spadefish | | | | | | | 50 | 1 |
| Spanish mackerel | | | | | | | 6,472 | 321 |
| Spearfish | | | | | | | (9) | (9) |
| Splittail | | | | | | | 19 | 1 |
| Spot | | | | | | | 5,833 | 207 |
| Squawfish | | | | | | | 5 | (9) |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 36,120 | 1,380 |
| Spotted | | | | | | | 5,409 | 467 |
| Squirrelfish | | | | | | | 1 | (9) |
| Steelhead trout | | | | | 33 | 3 | 3,987 | 334 |
| Striped bass | | | | | | | 3,286 | 481 |
| Sturgeon and sturgeon roe | 43 | 11 | 11 | 1 | | | 264 | 35 |
| Sturgeon, shovelnose | | | 229 | 23 | | | 229 | 23 |
| Suckers | 6,746 | 186 | 700 | 63 | | | 7,656 | 266 |
| Sunfish | 12 | 1 | 375 | 25 | | | 832 | 39 |
| Surf fishes | | | | | | | 371 | 15 |
| Swordfish | | | | | | | 5,932 | 989 |
| Tautog | | | | | | | 894 | 47 |
| Tenpounder | | | | | | | 191 | 6 |
| Thimble-eyed mackerel | | | | | | | 36 | 1 |
| Tilefish | | | | | | | 4,095 | 186 |
| Tomcod | | | | | | | 218 | 7 |
| Tripletail | | | | | | | 13 | 1 |
| Tullibee | 905 | 23 | | | | | 905 | 23 |

9 Less than 500 pounds or $500.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| FISH—continued | | | | | | | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | | | | | | | 286 | 24 |
| Bluefin | | | | | | | 21,921 | 1,238 |
| Bonito | | | | | | | 5,164 | 167 |
| Skipjack or striped | | | | | | | 20,486 | 790 |
| Yellowfin | | | | | | | 56,654 | 3,396 |
| Horse mackerel | | | | | | | 422 | 22 |
| Turbot | | | | | | | 1 | (1) |
| White bass | 484 | 24 | 65 | 5 | | | 549 | 29 |
| Whitebait | | | | | | | 275 | 19 |
| Whitefish | 10,172 | 1,599 | | | | | 10,397 | 1,612 |
| Whitefish, Menominee | 372 | 25 | | | | | 372 | 25 |
| White perch | | | | | | | 1,488 | 135 |
| Whiting | | | | | | | 14,003 | 179 |
| Wolffish | | | | | | | 2,657 | 54 |
| Yellow bass | | | 8 | 1 | | | 8 | 1 |
| Yellow perch | 6,578 | 330 | 22 | 2 | | | 7,083 | 372 |
| Yellow pike | 4,002 | 515 | 25 | 4 | | | 4,027 | 519 |
| Yellowtail | | | | | | | 4,863 | 217 |
| Miscellaneous fish | | | 73 | 5 | | | 217 | 10 |
| Total | 89,612 | 5,875 | 53,466 | 3,310 | 609,305 | 12,178 | 2,836,894 | 75,155 |
| SHELLFISH, ETC. | | | | | | | | |
| Abalone | | | | | | | 647 | 130 |
| Clams: | | | | | | | | |
| Cockle | | | | | | | 59 | 15 |
| Hard | | | | | | | 9,250 | 2,472 |
| Pismo | | | | | | | 22 | 10 |
| Razor | | | | | 853 | 48 | 2,074 | 228 |
| Soft | | | | | | | 14,492 | 813 |
| Surf | | | | | | | 461 | 54 |
| Mixed | | | | | | | 5 | 1 |
| Conchs | | | | | | | 55 | 3 |
| Crabs: | | | | | | | | |
| Hard | | | | | 195 | 18 | 74,162 | 1,752 |
| King | | | | | | | 6,184 | 29 |
| Rock | | | | | | | 1 | (1) |
| Soft | | | | | | | 8,860 | 789 |
| Stone | | | | | | | 308 | 27 |
| Crawfish | 51 | 3 | 8 | 1 | | | 236 | 22 |
| Lobsters: | | | | | | | | |
| Common | | | | | | | 13,916 | 3,587 |
| Spiny | | | | | | | 1,682 | 290 |
| Mussels, sea | | | | | | | 306 | 16 |
| Mussel shells | 5,285 | 160 | 54,205 | 932 | | | 59,490 | 1,092 |
| Octopus | | | | | | | 167 | 11 |
| Oysters: | | | | | | | | |
| Eastern, market, public | | | | | | | 35,377 | 3,460 |
| Eastern, market, private | | | | | | | 50,955 | 8,163 |
| Eastern, seed, public | | | | | | | 29,370 | 3,105 |
| Eastern, seed, private | | | | | | | 8,722 | 1,236 |
| Western, market | | | | | | | 316 | 259 |
| Japanese, market | | | | | | | 228 | 83 |
| Periwinkle | | | | | | | 330 | 39 |
| Scallops: | | | | | | | | |
| Bay | | | | | | | 4,217 | 760 |
| Sea | | | | | | | 2,450 | 450 |
| Shrimp | | | 147 | 15 | 932 | 42 | 92,327 | 3,134 |
| Squid | | | | | | | 18,484 | 293 |
| Terrapin | | | | | | | 75 | 30 |
| Turtles | | | 97 | 3 | | | 195 | 7 |
| Frogs | | | 232 | 20 | | | 232 | 20 |
| Irish moss | | | | | | | 93 | 6 |
| Sponges | | | | | | | 549 | 931 |
| Bloodworms | | | | | | | 54 | 63 |
| Sandworms | | | | | | | 58 | 61 |
| Miscellaneous shellfish | | | 16 | 3 | | | 16 | 3 |
| Pearls and slugs | | 12 | | 101 | | | | 113 |
| Total | 5,336 | 175 | 54,705 | 1,075 | 1,980 | 108 | 436,425 | 33,557 |

[1] Less than 500 pounds or $500.

*Fisheries of the United States and Alaska, 1930*—Continued

CATCH: BY SECTIONS—Continued

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Species | Lakes | | Mississippi River and tributaries | | Alaska | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| WHALE PRODUCTS [10] | | | | | | | | |
| Oil, sperm | | | | | 909 | 41 | 909 | 46 |
| Oil, whale | | | | | 6,125 | 37 | 9,969 | 538 |
| Whale meal and scrap | | | | | 2,340 | 51 | 2,340 | 51 |
| Other whale products | | | | | 43 | 2 | 43 | 2 |
| Total | | | | | 9,417 | 470 | 13,261 | 637 |
| Grand total | 94,948 | 6,050 | 108,171 | 4,385 | 620,702 | 12,756 | 3,286,580 | 109,349 |

CATCH: BY STATES

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| State | Marine and coastal rivers | | Mississippi River and tributaries | | Lakes [11] | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| Alabama | 7,113 | 315 | 1,921 | 42 | | | 9,034 | 357 |
| Arkansas | | | 24,964 | 744 | | | 24,964 | 744 |
| California | 696,891 | 12,473 | | | | | 696,891 | 12,473 |
| Connecticut | 88,012 | 4,519 | | | | | 88,012 | 4,519 |
| Delaware | 51,081 | 653 | | | | | 51,081 | 653 |
| Florida | 117,548 | 4,529 | | | 2,867 | 117 | 120,415 | 4,646 |
| Georgia | 34,873 | 536 | | | | | 34,873 | 536 |
| Illinois | | | 21,713 | 996 | 1,065 | 97 | 22,778 | 1,093 |
| Indiana | | | 6,255 | 268 | 1,160 | 81 | 7,415 | 349 |
| Iowa | | | 7,924 | 350 | | | 7,924 | 350 |
| Kansas | | | 344 | 24 | | | 344 | 24 |
| Kentucky | | | 3,920 | 185 | | | 3,920 | 185 |
| Louisiana | 49,886 | 1,960 | 11,850 | 603 | | | 61,736 | 2,563 |
| Maine | 143,823 | 4,330 | | | | | 143,823 | 4,330 |
| Maryland | 71,098 | 3,985 | | | | | 71,098 | 3,985 |
| Massachusetts | 442,474 | 16,289 | | | | | 442,474 | 16,289 |
| Michigan | | | 32 | 1 | 35,579 | 2,963 | 35,611 | 2,964 |
| Minnesota | | | 5,056 | 211 | 11,364 | 388 | 16,420 | 599 |
| Mississippi | 15,736 | 740 | 3,855 | 203 | | | 19,591 | 943 |
| Missouri | | | 1,429 | 102 | | | 1,429 | 102 |
| Nebraska | | | 135 | 15 | | | 135 | 15 |
| New Hampshire | 1,069 | 69 | | | | | 1,069 | 69 |
| New Jersey | 97,276 | 7,475 | | | | | 97,276 | 7,475 |
| New York | 45,495 | 4,934 | | | 1,701 | 150 | 47,196 | 5,084 |
| North Carolina | 168,938 | 1,836 | | | | | 168,938 | 1,836 |
| Ohio | | | 1,263 | 50 | 24,115 | 1,252 | 25,378 | 1,302 |
| Oklahoma | | | 318 | 31 | | | 318 | 31 |
| Oregon | 26,459 | 2,256 | | | | | 26,459 | 2,256 |
| Pennsylvania | 17 | 3 | | ([12]) | 3,419 | 279 | 3,436 | 282 |
| Rhode Island | 25,972 | 2,287 | | | | | 25,972 | 2,287 |
| South Carolina | 5,106 | 253 | | | | | 5,106 | 253 |
| South Dakota | | | 321 | 8 | | | 321 | 8 |
| Tennessee | | | 9,176 | 255 | | | 9,176 | 255 |
| Texas | 15,693 | 777 | 1,030 | 34 | | | 16,723 | 811 |
| Virginia | 245,294 | 7,487 | | | | | 245,294 | 7,487 |
| Washington | 110,038 | 8,335 | | | | | 110,038 | 8,335 |
| West Virginia | | | 45 | 7 | | | 45 | 7 |
| Wisconsin | | | 6,620 | 256 | 16,545 | 840 | 23,165 | 1,096 |
| Alaska | 620,702 | 12,756 | | | | | 620,702 | 12,756 |
| Total | 3,080,594 | 98,797 | 108,171 | 4,385 | 97,815 | 6,167 | 3,286,580 | 109,349 |

[10] The weight of whales caught was not determined; therefore, the weight of the manufactured product is shown.

[11] Includes Lake Ontario, Lake Erie, Lake Huron, Lake Michigan, LakeSuperior, Rainy Lake, Namakan Lake, Lake of the Woods, Lake Okeechobee, and several mussel-bearing streams tributary to Lakes Huron and Michigan.

[12] Less than $500.

*Yield of marine fisheries of the United States, 1930: By gear*

| Gear | New England | | Middle Atlantic | | Chesapeake | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Purse seines | 83,344,140 | $1,678,805 | 58,108,240 | $528,657 | 115,599,007 | $832,726 |
| Haul seines | 4,334,554 | 123,566 | 6,156,131 | 175,977 | 5,734,552 | 326,897 |
| Gill nets | 27,051,446 | 800,404 | 4,457,543 | 304,193 | 3,066,406 | 380,319 |
| Lines | 136,994,604 | 4,295,936 | 14,170,459 | 643,599 | 50,569,342 | 887,771 |
| Pound nets | 16,296,727 | 323,109 | 31,458,940 | 1,173,658 | 71,477,764 | 2,659,770 |
| Floating traps | 13,313,815 | 300,587 | 356,444 | 20,864 | | |
| Weirs | 32,615,387 | 183,934 | 3,974,060 | 16,243 | | |
| Stop nets | | | 137,008 | 18,659 | 31,800 | 3,636 |
| Fyke nets | 209,122 | 20,201 | 3,715,253 | 110,383 | 1,336,855 | 77,044 |
| Dip nets | 6,896,327 | 91,929 | 126,332 | 21,465 | 3,359,848 | 262,185 |
| Cast nets | | | 8,707 | 1,279 | 24,000 | 2,520 |
| Scap nets | | | 92,614 | 8,693 | | |
| Bag nets | 165,213 | 22,578 | | | | |
| Drag nets | | | 146,170 | 21,473 | | |
| Push nets | 70,200 | 20,550 | 23,680 | 4,856 | | |
| Pocket nets | 1,550 | 293 | | | | |
| Otter trawls | 324,670,060 | 10,456,829 | 14,754,753 | 496,143 | 1,882,747 | 86,319 |
| Traps | 209,825 | 7,729 | | | | |
| Pots | 15,217,939 | 3,444,182 | 3,462,348 | 492,830 | 291,860 | 25,445 |
| Harpoons | 5,241,197 | 875,957 | 234,140 | 37,887 | | |
| Spears | 169,124 | 19,332 | 231,117 | 29,842 | 16,600 | 1,244 |
| Scrapes, crab | | | | | 7,428,389 | 426,452 |
| Dredges | 18,044,906 | 3,219,820 | 46,234,785 | 7,308,141 | 17,816,643 | 1,361,773 |
| Tongs | 2,436,536 | 518,414 | 3,016,720 | 843,674 | 36,782,927 | 4,002,538 |
| Rakes | 1,354,593 | 330,354 | 1,550,045 | 481,311 | 866,972 | 103,687 |
| Forks | 11,588,903 | 499,068 | 605,460 | 199,079 | | |
| Hoes | 2,097,266 | 163,683 | 327,419 | 40,921 | | |
| Picks | | | | | 19,432 | 7,564 |
| Gaffs | | | 4,350 | 784 | | |
| By hand | 27,545 | 6,219 | 515,263 | 83,061 | 87,780 | 24,160 |
| Total | 701,350,979 | 27,493,479 | 193,867,981 | 13,063,672 | 316,392,924 | 11,472,050 |

| Gear | South Atlantic and Gulf | | Pacific | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Purse seines | 198,360,548 | $803,822 | 248,983,923 | $4,595,310 | 704,395,858 | $8,439,320 |
| Haul seines | 26,775,958 | 1,000,661 | 5,750,111 | 508,288 | 48,751,306 | 2,135,389 |
| Gill nets | 37,867,157 | 1,645,386 | 31,501,924 | 2,710,774 | 103,944,476 | 5,841,076 |
| Trammel nets | 5,399,327 | 317,993 | 813,607 | 87,378 | 6,212,934 | 405,374 |
| Lines | 24,870,957 | 1,252,261 | 156,287,360 | 8,849,242 | 382,892,722 | 15,928,808 |
| Pound nets | 12,660,693 | 302,194 | 21,047,315 | 1,740,620 | 151,941,439 | 6,199,351 |
| Floating traps | | | | | 13,670,259 | 411,459 |
| Weirs | 5,000 | 250 | 437,800 | 2,579 | 37,032,247 | 203,001 |
| Wheels | 141,000 | 1,725 | 280,713 | 34,086 | 421,713 | 35,811 |
| Stop nets | | | | | 168,808 | 22,296 |
| Fyke nets | 1,156,996 | 59,917 | 471,750 | 58,374 | 6,889,976 | 325,911 |
| Dip nets | 517,829 | 32,303 | 2,628,623 | 113,652 | 13,528,959 | 521,535 |
| Cast nets | 119,083 | 6,789 | | | 151,790 | 10,589 |
| Scap nets | | | | | 92,614 | 8,693 |
| Bag nets | | | 1,296,247 | 19,444 | 1,461,460 | 42,022 |
| Drag nets | | | 191,501 | 12,171 | 337,671 | 33,644 |
| Push nets | | | | | 93,880 | 25,406 |
| Pocket nets | | | | | 1,550 | 293 |
| Reef nets | | | 5,162 | 380 | 5,162 | 380 |
| Lampara nets | | | 329,089,383 | 1,769,106 | 329,089,383 | 1,769,106 |
| Paranzella nets | | | 18,926,040 | 840,980 | 18,926,040 | 840,980 |
| Otter trawls | 87,967,911 | 2,989,583 | | | 429,275,471 | 14,028,374 |
| Beam trawls | | | 2,054,893 | 46,447 | 2,054,893 | 46,447 |
| Traps | 116,073 | 6,714 | 6,504,771 | 702,072 | 6,830,669 | 716,515 |
| Pots | 696,426 | 53,911 | | | 19,668,573 | 4,016,368 |
| Harpoons | | | 4,379,252 | 240,810 | 9,854,589 | 1,154,654 |
| Spears | 172,016 | 14,964 | | | 588,857 | 65,382 |
| Scrapes, crab | | | | | 7,428,389 | 426,452 |
| Dredges | 8,815,612 | 620,309 | | | 90,911,946 | 12,519,043 |
| Tongs | 7,209,318 | 717,623 | [1] 2,090,894 | 602,089 | 51,536,395 | 6,684,338 |
| Rakes | 438,645 | 55,573 | | | 4,210,255 | 970,925 |
| Forks | 97,928 | 7,630 | | | 12,292,291 | 705,777 |
| Hoes | | | | | 2,424,685 | 204,604 |
| Grabs | 3,111,470 | 119,863 | | | 3,111,470 | 119,863 |
| Picks | | | | | 19,432 | 7,564 |
| Gaffs | | | | | 4,350 | 784 |
| Hooks | 238,418 | 220,758 | | | 238,418 | 220,758 |
| Diving apparatus, abalone or sponge | 333,583 | 710,402 | 647,316 | 130,331 | 980,899 | 840,733 |
| By hand | 687,518 | 115,188 | 58 | 7 | 1,318,164 | 228,635 |
| Total | 417,759,466 | 11,064,819 | 833,388,643 | 23,064,140 | 2,462,759,993 | 86,158,160 |

[1] Includes catch by rakes and shovels.

*Industries related to the fisheries of the United States and Alaska, 1930* [1]

| Item | New England | Middle Atlantic | Chesapeake | South Atlantic and Gulf | Pacific |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged— | | | | | |
| On vessels | 363 | 101 | 855 | 437 | 249 |
| On boats | 1 | 117 | | 349 | |
| Total | 364 | 218 | 855 | 786 | 249 |
| Vessels— | | | | | |
| Steam | 3 | | | | 1 |
| Net tonnage | 150 | | | | 33 |
| Motor | 147 | 35 | 404 | 142 | 98 |
| Net tonnage | 1,835 | 525 | 5,273 | 1,418 | 2,250 |
| Sail | | | 24 | 43 | |
| Net tonnage | | | 737 | 409 | |
| Total vessels | 150 | 35 | 428 | 185 | 99 |
| Total net tonnage | 1,985 | 525 | 6,010 | 1,827 | 2,283 |
| Boats | 1 | 176 | | 221 | |
| Wholesale and manufacturing: | | | | | |
| Establishments | 450 | 444 | 543 | 587 | 309 |
| Persons engaged— | | | | | |
| Proprietors | 364 | 531 | 812 | 726 | 385 |
| Salaried employees | 1,028 | 964 | 294 | 374 | 897 |
| Wage earners: | | | | | |
| Average for season | 9,862 | 4,254 | 10,569 | 13,535 | 10,554 |
| Average for year | 5,163 | 3,198 | 4,708 | 5,848 | 5,080 |
| Salaries and wages paid | $8,455,460 | $7,956,080 | $2,976,346 | $3,464,041 | $8,636,995 |
| Manufactured products [5] | $26,755,350 | $15,421,325 | $10,383,691 | $12,320,405 | $45,958,393 |
| Fishermen's manufactured products: | | | | | |
| Persons engaged | 4,147 | 592 | 531 | 1,011 | (6) |
| Products | 862,965 | 460,113 | 108,140 | 265,165 | (6) |

| Item | Lakes | Mississippi River and tributaries | Alaska | Total |
|---|---|---|---|---|
| Transporting: | | | | |
| Persons engaged— | | | | |
| On vessels | 76 | 27 | 1,926 | 4,034 |
| On boats | | | (2) | 467 |
| Total | 76 | 27 | 1,926 | 4,501 |
| Vessels— | | | | |
| Steam | 6 | | 20 | 30 |
| Net tonnage | 193 | | 32,948 | 33,324 |
| Motor | 16 | 13 | 466 | 1,321 |
| Net tonnage | 249 | 214 | 14,927 | 26,691 |
| Sail | | | 1 | 68 |
| Net tonnage | | | 1,590 | 2,736 |
| Total vessels | 22 | 13 | 487 | 1,419 |
| Total net tonnage | 442 | 214 | 49,465 | 62,751 |
| Boats | | | [3] 965 | 1,363 |
| Wholesale and manufacturing: | | | | |
| Establishments | 228 | 174 | 260 | 2,995 |
| Persons engaged— | | | | |
| Proprietors | 306 | 6,383 | 15,453 | (4) |
| Salaried employees | 375 | | | (4) |
| Wage earners: | | | | |
| Average for season | 1,330 | | | (4) |
| Average for year | 1,102 | (4) | (4) | (4) |
| Salaries and wages paid | $2,985,988 | $4,639,877 | (4) | (4) |
| Manufactured products [5] | $1,763,205 | $3,804,914 | $33,852,986 | $150,260,269 |
| Fishermen's manufactured products: | | | | |
| Persons engaged | 566 | (6) | (6) | (6) |
| Products | 257,033 | (6) | (6) | (6) |

[1] Data for Mississippi River and tributaries are for 1922 with the exception of the number of establishments and value of manufactured products of the pearl button industry which are for 1930.
[2] Included on vessels.
[3] Includes scows, houseboats, pile drivers, etc.
[4] Detailed statistics not available.
[5] These production figures are not comparable with those shown in previous reports since packaged fresh and frozen fishery products of the marine and lakes sections are now included.
[6] Data not available.

## MANUFACTURED FISHERY PRODUCTS TRADE

Statistics of the products of the various manufactured fishery enterprises were collected more completely for the year 1930 than for any previous year. It will be noted that in addition to statistics on the production of cured fishery products, canned fishery products, and by-products that the data presented herewith indicate the output of all packaged fishery products, including shucked oysters, crab meat, and the like.

This compilation includes the production throughout the marine and lake areas of the United States and Alaska, but does not include the manufactured products of the Mississippi River and tributaries.

*Production of manufactured fishery products and by-products in the marine and lake sections of the United States and Alaska, 1930* [1]

| Item | | Quantity | Value |
|---|---|---|---|
| Alewives: | | | |
| Salted | pounds | 12,623,595 | $354,987 |
| Corned | do | 1,622,600 | 31,270 |
| Spiced | do | 157,500 | 13,800 |
| Pickled | do | 1,786,976 | 103,175 |
| Smoked | do | 298,231 | 13,758 |
| Canned | standard cases | 76,732 | 232,121 |
| Roe, canned | do | 56,874 | 206,604 |
| Dry scrap | tons | 1,010 | 46,254 |
| Oil | gallons | 33,889 | 7,173 |
| Barracuda, fresh fillets | pounds | 225,000 | 43,500 |
| Blue pike: | | | |
| Fresh fillets | do | 618,301 | 127,490 |
| Frozen fillets | do | 145,250 | 29,050 |
| Buffalofish, smoked | do | 743,952 | 312,493 |
| Butterfish: | | | |
| Pandressed | do | 63,986 | 7,610 |
| Smoked | do | 650,848 | 107,655 |
| Cabrilla, fresh fillets | do | 115,000 | 20,250 |
| Carp, smoked | do | 106,500 | 31,750 |
| Cisco, chubs, and tullibee, smoked | do | 8,272,227 | 2,323,455 |
| Cod: | | | |
| Fresh sticks | do | 280,390 | 49,486 |
| Fresh fillets | do | 5,642,605 | 843,373 |
| Frozen fillets | do | 1,609,928 | 215,320 |
| Salted bits | do | 21,627 | 1,808 |
| Salted, including boneless salted | do | 15,617,613 | 1,044,561 |
| Salted, packaged | do | 2,812,077 | [2] 412,740 |
| Stockfish | do | 15,600 | 2,090 |
| Pickled | do | 120,185 | 5,665 |
| Smoked fillets | do | 638,022 | 94,981 |
| Cakes, balls, etc., canned | standard cases | 28,224 | 259,659 |
| Oil, cod and cod-liver | gallons | 135,884 | 102,857 |
| Croaker: | | | |
| Pandressed | pounds | 858,705 | 83,926 |
| Fresh fillets | do | 28,400 | 3,473 |
| Cusk: | | | |
| Fresh sticks | do | 150,490 | 25,732 |
| Fresh fillets | do | 340,680 | 53,507 |
| Frozen fillets | do | 17,460 | 1,971 |
| Salted | do | 508,408 | 22,933 |
| Smoked fillets | do | 869,635 | 122,649 |
| Eels: | | | |
| Salted | do | 63,400 | 6,340 |
| Smoked | do | 77,682 | 28,160 |
| Flounders: | | | |
| Pandressed | do | 85,565 | 10,032 |
| Fresh fillets | do | 6,208,203 | 1,240,236 |
| Frozen fillets | do | 359,809 | 61,712 |
| Groupers, fresh steaks | do | 107,000 | 19,220 |

[1] The figures in the above table do not check in all instances with figures on certain manufactured products shown in the report for 1930. This is due to the fact that the above figures were obtained as the result of a more detailed survey, and several firms' production is included which is not shown in the previous report. The figures herewith include the production of every primary firm in the marine and lakes sections of the United States and Alaska manufacturing fishery products or by-products as shown above which operated in 1930 to the knowledge of the bureau.

[2] The item of 2,812,077 pounds of salted packaged cod, valued at $412,740, is included in the total, however, it should be explained that this item represents a further manufacture of salted cod which is shown elsewhere in the table.

*Production of manufactured fishery products and by-products in the marine and lake sections of the United States and Alaska, 1930*—Continued

| Item | | Quantity | Value |
|---|---|---|---|
| Haddock: | | | |
| Pandressed | pounds | 38,590 | $5,789 |
| Fresh sticks | do | 183,470 | 31,564 |
| Fresh fillets | do | 44,189,952 | 6,980,307 |
| Frozen fillets | do | 19,511,707 | 3,017,548 |
| Salted | do | 679,499 | 39,034 |
| Finnan haddie | do | 5,098,811 | 478,303 |
| Finnan haddie, canned | standard cases | 1,002 | 15,339 |
| Smoked fillets | pounds | 1,035,443 | 191,654 |
| Flakes, canned | standard cases | 62,067 | 614,475 |
| Hake: | | | |
| Sticks, fresh and frozen | pounds | 214,060 | 35,099 |
| Fresh fillets | do | 2,195,512 | 284,188 |
| Frozen fillets | do | 439,102 | 58,200 |
| Salted | do | 5,006,869 | 173,998 |
| Smoked fillets | do | 55,602 | 6,178 |
| Halibut: | | | |
| Fresh fillets | do | 46,472 | 16,217 |
| Frozen fillets | do | 10,859 | 2,810 |
| Steaks | do | 89,938 | 15,105 |
| Salted | do | 5,220 | 649 |
| Herring, sea: | | | |
| Salted, including Scotch-cured | do | 8,722,670 | 500,772 |
| Roused | do | 352,500 | 15,045 |
| Norwegian cure | do | 145,375 | 9,156 |
| Spiced and Bismark | do | 76,100 | 7,766 |
| Kippered | do | 198,163 | 43,715 |
| Smoked— | | | |
| Bloaters | do | 2,850,862 | 270,692 |
| Boneless | do | 1,387,750 | 149,283 |
| Lengthwise | do | 127,794 | 12,780 |
| Medium scaled | do | 265,088 | 26,263 |
| Miscellaneous | do | 730,959 | 105,517 |
| Canned, "sardines" | standard cases | 1,399,212 | 4,459,071 |
| Pomace | tons | 3,736 | 7,592 |
| Meal | do | 13,831 | 732,963 |
| Oil | gallons | 3,670,664 | 908,359 |
| Scales | pounds | 81,153 | 1,932 |
| Herring, lake: | | | |
| Salted | do | 8,082,003 | 248,851 |
| Spiced | do | 95,000 | 13,350 |
| Smoked, including smoked fillets | do | 637,440 | 66,670 |
| Lake trout: | | | |
| Salted | do | 201,950 | 29,571 |
| Smoked | do | 472,413 | 132,369 |
| Mackerel: | | | |
| Fresh and frozen fillets | do | 178,432 | 37,453 |
| Salted | do | 2,410,532 | 197,140 |
| Salted, fillets and split | do | 2,184,364 | 247,356 |
| Smoked | do | 328,571 | 65,718 |
| Canned | standard cases | 132,262 | 467,885 |
| Menhaden: | | | |
| Acid scrap | tons | 15,725 | 395,295 |
| Dry scrap | do | 23,235 | 1,113,201 |
| Meal | do | 9,752 | 514,717 |
| Oil | gallons | 3,311,215 | 654,195 |
| Mullet: | | | |
| Salted and dry-salted | pounds | 2,071,289 | 128,011 |
| Roe, salted | do | 75,184 | 19,295 |
| Pilchard or sardines: | | | |
| Salted | do | 65,490 | 3,472 |
| Canned | standard cases | 2,979,333 | 8,741,928 |
| Meal | tons | 25,938 | 1,414,858 |
| Oil | gallons | 5,803,166 | 1,826,319 |
| Pollock: | | | |
| Fresh fillets | pounds | 277,714 | 36,298 |
| Frozen fillets | do | 25,773 | 3,594 |
| Salted | do | 3,133,905 | 171,113 |
| Rockfishes, fresh fillets | do | 761,500 | 120,400 |
| Sablefish: | | | |
| Salted | do | 176,009 | 12,107 |
| Pickled | do | 10,800 | 540 |
| Smoked | do | 333,477 | 75,782 |
| Salmon: | | | |
| Steaks | do | 34,917 | 5,565 |
| Dried | do | 1,593,600 | 115,585 |
| Mild-cured | do | 10,157,175 | 2,065,553 |
| Salted | do | 189,546 | 24,684 |
| Pickled | do | 863,150 | 103,661 |
| Kippered | do | 2,672,214 | [1] 594,547 |

[1] An item of 300,000 pounds of kippered salmon valued at $115,000, and an item of 6,844,175 pounds of smoked salmon, valued at $2,665,881, are included in the total; however, it should be explained that these items represent a further manufacture of mild-cured salmon which is shown elsewhere in the table.

*Production of manufactured fishery products and by-products in the marine and lake sections of the United States and Alaska, 1930*—Continued

| Item | Quantity | Value |
|---|---|---|
| Salmon—Continued. | | |
| Smoked ... pounds | 7,660,931 | [3] $2,935,420 |
| Canned ... standard cases | 6,086,479 | 42,828,172 |
| Meal ... tons | 2,487 | 136,745 |
| Oil ... gallons | 233,941 | 53,778 |
| Eggs— | | |
| For food, canned ... standard cases | 1,667 | 15,683 |
| For bait, canned ... do | 4,345 | 103,753 |
| Sea bass, black, fresh fillets ... pounds | 55,500 | 7,825 |
| Sea bass, white, fresh fillets ... do | 326,250 | 79,375 |
| Shad: | | |
| Smoked ... do | 169,784 | [4] 38,020 |
| Canned ... standard cases | 12,248 | 42,190 |
| Roe, canned ... do | 3,339 | 69,579 |
| Shark oil ... gallons | 4,460 | 1,190 |
| Spanish mackerel, dry-salted ... pounds | 75,421 | 5,714 |
| Spot: | | |
| Pandressed ... do | 34,445 | 4,451 |
| Salted and dry-salted ... do | 172,000 | 10,220 |
| Squeteague: | | |
| Pandressed ... do | 802,309 | 85,014 |
| Fresh fillets ... do | 233,935 | 37,410 |
| Sun-dried ... do | 27,717 | 8,316 |
| Sturgeon: | | |
| Smoked ... do | 2,060,699 | 1,592,277 |
| Roe— | | |
| Fresh ... do | 182 | 164 |
| Salted ... do | 740 | 741 |
| Caviar, canned ... standard cases | 8,024 | 1,004,820 |
| Totuava, fillets ... pounds | 260,000 | 52,000 |
| Tuna and tunalike fishes: | | |
| Salted bonito ... do | 18,134 | 1,567 |
| Canned ... standard cases | 2,010,640 | 13,055,876 |
| Meal ... tons | 8,554 | 428,556 |
| Oil ... gallons | 56,748 | 14,153 |
| Whales: | | |
| Pickled meat ... pounds | 37,000 | 1,850 |
| Meal ... tons | 1,170 | 51,400 |
| Bone ... pounds | 5,600 | 308 |
| Oil— | | |
| Whale ... gallons | 1,325,229 | 536,904 |
| Sperm ... do | 128,027 | 48,009 |
| Whitefish: | | |
| Salted ... pounds | 112,523 | 8,221 |
| Smoked ... do | 661,759 | 221,385 |
| Caviar ... do | 950 | 476 |
| Caviar, canned ... standard cases | 866 | 26,804 |
| Whiting, pandressed ... pounds | 88,445 | 6,023 |
| Wolffish: | | |
| Fresh fillets ... do | 19,812 | 3,719 |
| Frozen fillets ... do | 37,737 | 5,280 |
| Yellow perch, fresh fillets ... do | 180,224 | 38,706 |
| Crab meat: | | |
| Packaged, fresh cooked ... do | 5,573,474 | 1,783,498 |
| Canned ... standard cases | 1,596 | 57,810 |
| King crab, scrap ... tons | 636 | 24,061 |
| Lobster meat, packaged, fresh cooked ... pounds | 103,716 | 129,488 |
| Spiny lobster, whole, cooked ... do | 1,064,250 | 287,693 |
| Shrimp: | | |
| Headless, packaged— | | |
| Fresh ... do | 1,123,129 | 287,282 |
| Frozen ... do | 1,485,387 | 266,878 |
| Cooked, fresh ... do | 330,615 | 103,844 |
| Canned ... standard cases | 826,242 | 5,013,337 |
| Sun-dried ... pounds | 1,740,329 | 368,684 |
| Meal ... tons | 2,386 | 74,287 |
| Abalone, steaks ... pounds | 583,580 | 248,025 |
| Clams, hard: | | |
| Fresh-shucked ... gallons | 27,931 | 61,615 |
| Canned— | | |
| Whole ... standard cases | 28,502 | 164,883 |
| Chowder ... do | 254,449 | 1,011,499 |
| Minced ... do | 4,476 | 29,583 |
| Cocktail juice and broth ... do | 12,945 | 98,703 |

[4] An item of 16,050 pounds of smoked shad, valued at $4,182, is included in the total; however, it should be explained that this item represents a further manufacture of mild-cured shad which is included elsewhere in the table.

*Production of manufactured fishery products and by-products in the marine and lake sections of the United States and Alaska, 1930*—Continued

| Item | | Quantity | Value |
|---|---|---|---|
| Clams, razor, canned: | | | |
| Whole | standard cases | 5,793 | $50,157 |
| Chowder | do | 640 | 1,600 |
| Minced | do | 67,533 | 612,754 |
| Juice | do | 566 | 2,311 |
| Clams, soft: | | | |
| Fresh shucked | gallons | 189,577 | 232,079 |
| Canned— | | | |
| Whole | standard cases | 95,203 | 419,636 |
| Chowder | do | 71,240 | 209,989 |
| Juice and broth | do | 16,388 | 54,782 |
| Marine-shell products: | | | |
| Blanks | gross | 721,346 | 336,628 |
| Buttons | do | 4,286,617 | 3,651,983 |
| Novelties | | | 776,334 |
| Mussels, fresh-water: | | | |
| Shells— | | | |
| Blanks | gross | 176,740 | 36,812 |
| Buttons | do | 1,023,618 | 369,705 |
| Novelties | | | 75 |
| Oysters: | | | |
| Eastern— | | | |
| Fresh-shucked | gallons | 5,435,368 | 9,937,898 |
| Canned | standard cases | 403,981 | 1,871,804 |
| Japanese, fresh-shucked | gallons | 27,950 | 97,825 |
| Western, fresh-shucked | do | 39,405 | 311,125 |
| Shell products— | | | |
| Poultry feed | tons | 279,470 | 2,316,576 |
| Lime | do | 58,113 | 194,444 |
| Lime, "burned" | do | 9,847 | 89,290 |
| Scallops, bay, fresh-shucked | gallons | 463,863 | 821,574 |
| Scallops, sea, fresh-shucked | do | 272,153 | 502,229 |
| Squid, dried | pounds | 1,383,660 | 55,346 |
| Turtle meat and soup, canned | standard cases | 4,663 | 94,889 |
| Terrapin meat and stew, canned | do | 96 | 8,003 |
| Unclassified products: | | | |
| Fillets and steaks [5] | pounds | 737,796 | 89,806 |
| Miscellaneous packaged [6] | do | 172,230 | 29,603 |
| Salted— | | | |
| Cheeks and tongues | do | 12,858 | 1,016 |
| Other [7] | do | 509,503 | 40,661 |
| Pickled and spiced [8] | do | 163,313 | 30,653 |
| Smoked [9] | do | 189,900 | 46,389 |
| Canned— | | | |
| Fish for cat and dog food | standard cases | 16,587 | 50,460 |
| Other [10] | do | 131,492 | 1,028,716 |
| Dry scrap | tons | 893 | 39,767 |
| Meal [11] | do | 16,660 | 1,026,191 |
| Oil— | | | |
| Tanner's | gallons | 40,618 | 10,137 |
| Miscellaneous [12] | do | 72,445 | 21,573 |
| Glue | do | 524,082 | 1,240,558 |
| Other by-products [13] | | | 344,777 |
| Total fresh and frozen packaged products | pounds | 157,378,368 | 28,996,454 |
| Total cured products | do | 124,496,656 | 16,837,406 |
| Total canned products | do | 577,782,585 | 83,015,055 |
| Total by-products | | | 19,559,856 |
| Grand total | | | 148,408,771 |

[5] Includes amberjack, bluefish, butterfish, grouper, lake trout, mullet, jack pike, red snapper, salmon sauger pike, shad, snook, Spanish mackerel, whitefish, and whiting fillets; amberjack, "lingcod," red snapper and rockfish steaks; and red snapper and whiting sticks.

[6] Includes fresh alewife roe, pandressed bluefish; cisco caviar; packaged fish cakes; fresh-shucked conchs; and frozen packaged scallops.

[7] Includes salted anchovies, barracuda, bluefish, cabrilla, ciscoes, black and white sea bass, shad and yellowtail; corned shad; and mild-cured shad.

[8] Includes spiced carp; pickled lake herring, sea herring, lake trout, and Dolly Varden trout.

[9] Includes smoked flounders, pilchard, sablefish, and salmon fillets.

[10] Includes canned smoked eels, fish cakes, etc., haddock fillets, creamed fish, smoked sea herring, spiced and soused salmon, salmon roe, smoked sturgeon, shrimp gumbo soup, abalone, clam cakes, pickled mussels, squid, herring for bait, and miscellaneous fish eggs for food.

[11] Includes meal from mackerel, king crabs, clams, kelp, and mixed species.

[12] Includes oil from blackfish, mackerel, shark livers, and mixed species.

[13] Includes agar-agar; alginates, crab scrap, fish flour, isinglass, menhaden for bait, poultry feed and lime from fresh-water mussel shells, sea herring skins, and shark fins, meat, skins, and teeth.

## CANNED FISHERY PRODUCTS AND BY-PRODUCTS TRADE

The output of canned fishery products and by-products in the United States and Alaska in 1931 was valued at $79,513,846. Of the total, canned products comprised $62,948,791 and by-products $16,565,055, a decrease of 24 per cent in the value of canned products and 30 per cent in the value of by-products when compared with the respective values of the same groups for the previous year.

Fishery products were canned at 412 establishments in the United States and Alaska during 1931. The combined output of these canneries amounted to 12,580,826 standard cases. The net weight of the products canned amounted to 506,414,020 pounds.

Canned fishery products or by-products were prepared in 27 States and Alaska during 1931. Alaska ranked first in the value of these products, accounting for 38 per cent of the total; California ranked second with 19 per cent of the total; and Washington ranked third with 9 per cent.

*Canned fishery products and by-products of the United States and Alaska, 1931*

SUMMARY OF PRODUCTION: BY COMMODITIES

| Product | Number of plants | Standard cases | Pounds | Value |
|---|---|---|---|---|
| Canned products: | | | | |
| Salmon— | | | | |
| United States | 50 | 1,336,234 | 64,139,232 | $8,986,308 |
| Alaska | 116 | 5,403,811 | 259,382,928 | 29,096,868 |
| Sardines— | | | | |
| Maine | 27 | 885,408 | 22,135,200 | 2,647,187 |
| California | 22 | 1,713,407 | 82,243,536 | 4,715,089 |
| Tuna and tunalike fishes | 15 | 1,216,976 | 29,207,424 | 7,279,392 |
| Alewives | 16 | 34,620 | 1,661,760 | 78,973 |
| Alewife roe | 31 | 32,740 | 1,571,520 | 132,073 |
| Shad | 4 | 747 | 35,856 | 2,091 |
| Shad roe | 9 | 2,100 | 100,800 | 63,060 |
| Mackerel | 8 | 102,392 | 4,914,816 | 246,848 |
| Fish flakes | 5 | 28,486 | 1,367,328 | 514,553 |
| Fish cakes, balls, etc | 7 | 103,704 | 4,977,792 | 779,411 |
| Cat and dog food | 4 | 52,509 | 2,520,432 | 143,345 |
| Salmon roe and caviar | 5 | 3,360 | 161,280 | 30,486 |
| Sturgeon caviar | 8 | 4,630 | 222,240 | 609,502 |
| Whitefish roe and caviar | 6 | 829 | 39,792 | 23,498 |
| Salmon eggs (for bait) | 10 | 5,246 | 251,808 | 149,186 |
| Miscellaneous fish, roe, and caviar | 10 | 9,391 | 450,768 | 77,870 |
| Oysters | 43 | 306,278 | 4,594,170 | 963,525 |
| Shrimp | 55 | 821,375 | 13,758,649 | 3,982,247 |
| Clam products | 61 | 500,040 | [1] 11,882,625 | 2,256,909 |
| Crabs | 5 | 646 | 31,008 | 12,817 |
| Turtle products | 3 | 4,058 | 194,784 | 74,945 |
| Miscellaneous shellfish | 6 | 11,839 | 568,272 | 82,608 |
| Total | [2] 412 | 12,580,826 | 506,414,020 | 62,948,791 |

| | Quality | Value |
|---|---|---|
| By-products: | | |
| Oyster-shell products ... tons | 306,229 | $1,992,024 |
| Fresh-water mussel-shell products | | 4,970,240 |
| Marine pearl-shell products | | 3,552,903 |
| Scrap, meal, etc ... tons | 84,183 | 2,986,395 |
| Marine-animal oils ... gallons | 8,565,651 | 1,619,936 |
| Miscellaneous by-products | | 1,443,557 |
| Total | | 16,565,055 |
| Grand total | | 79,513,846 |

[1] "Cut out" or "Drained" weights of can contents are included for whole and minced clams, and gross can contents for chowder, bouillon, broth, juice, and cocktail.
[2] Exclusive of duplication.

*Canned fishery products and by-products of the United States and Alaska, 1931*—Continued

VALUE OF PRODUCTION: BY STATES

| State | Canned products | By-products [1] | Total |
|---|---|---|---|
| Maine | $3,580,321 | $219,647 | $3,799,968 |
| Massachusetts and Rhode Island | 1,134,691 | 1,650,629 | 2,785,320 |
| Connecticut | | 992,744 | 992,744 |
| New York and New Jersey | 1,345,155 | 2,826,450 | 4,171,605 |
| Pennsylvania | | 572,905 | 572,905 |
| Delaware | | 96,155 | 96,155 |
| Maryland | 77,831 | 695,692 | 773,523 |
| Virginia | 129,551 | 939,218 | 1,068,769 |
| North Carolina | 22,439 | 152,443 | 174,882 |
| South Carolina | 293,688 | 75,604 | 369,292 |
| Georgia and Florida | 937,312 | 441,099 | 1,378,411 |
| Alabama | 270,886 | 47,456 | 318,342 |
| Mississippi | 1,283,437 | 225,200 | 1,508,637 |
| Louisiana | 1,863,897 | 683,945 | 2,547,842 |
| Texas, Utah, and Wisconsin | 458,756 | 157,249 | 616,005 |
| Missouri, Illinois, and Kentucky | | 75,988 | 75,988 |
| Iowa | | 3,583,013 | 3,583,013 |
| Washington | 6,752,088 | 133,035 | 6,885,123 |
| Oregon | 2,858,046 | 15,170 | 2,873,216 |
| California | 12,529,384 | 2,290,600 | 14,819,984 |
| Alaska | 29,411,309 | 690,813 | 30,102,122 |
| Total | 62,948,791 | 16,565,055 | 79,513,846 |

[1] Including menhaden, fresh-water mussel-shell, and marine pearl-shell products.

*Pack of canned salmon, Pacific Coast States and Alaska, 1931, standard cases*

| Product | Alaska | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Southeast | | Central | | Western | | Total | |
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Chinook or king: | | | | | | | | |
| 1-pound tall | 7,093 | $46,476 | 9,126 | $65,671 | 5,719 | $39,597 | 21,938 | $151,744 |
| 1-pound flat | 3,155 | 33,216 | 10,722 | 117,342 | 2,844 | 28,185 | 16,721 | 178,743 |
| ½-pound flat | 4,648 | 55,133 | 7,751 | 93,677 | 809 | 8,090 | 13,208 | 156,900 |
| Total | 14,896 | 134,825 | 27,599 | 276,690 | 9,372 | 75,872 | 51,867 | 487,387 |
| Blueback, red or sockeye: | | | | | | | | |
| 1-pound tall | 116,327 | 1,074,133 | 383,495 | 3,471,793 | 1,095,276 | 9,859,166 | 1,595,098 | 14,405,092 |
| 1-pound flat | 17,972 | 179,720 | 19,175 | 186,951 | 3,855 | 38,210 | 41,002 | 404,881 |
| ½-pound flat | 13,596 | 217,725 | 36,483 | 458,175 | 8,099 | 100,215 | 58,178 | 776,115 |
| Total | 147,895 | 1,471,578 | 439,153 | 4,116,919 | 1,107,230 | 9,997,591 | 1,694,278 | 15,586,088 |
| Silver or coho: | | | | | | | | |
| 1-pound tall | 77,885 | 506,653 | 79,037 | 471,763 | 92 | 556 | 157,014 | 978,972 |
| 1-pound flat | 2,663 | 20,239 | 239 | 1,670 | | | 2,902 | 21,909 |
| ½-pound flat | 7,907 | 89,649 | 2,055 | 16,104 | | | 9,962 | 105,753 |
| Total | 88,455 | 616,541 | 81,331 | 489,537 | 92 | 556 | 169,878 | 1,106,634 |
| Humpback or pink: | | | | | | | | |
| 1-pound tall | 1,967,051 | 6,797,186 | 935,875 | 3,141,778 | | | 2,902,926 | 9,938,964 |
| 1-pound flat | 2,242 | 8,849 | 2,168 | 7,805 | | | 4,410 | 16,654 |
| ½-pound flat | 44,149 | 246,768 | 2,375 | 13,112 | | | 46,524 | 259,880 |
| Total | 2,013,442 | 7,052,803 | 940,418 | 3,162,695 | | | 2,953,860 | 10,215,498 |
| Chum or keta: | | | | | | | | |
| 1-pound tall | 270,256 | 870,630 | 192,768 | 606,056 | 66,555 | 202,202 | 529,579 | 1,678,888 |
| 1-pound flat | | | 35 | 140 | | | 35 | 140 |
| ½-pound flat | 3,992 | 20,745 | 250 | 912 | | | 4,242 | 21,657 |
| Total | 274,248 | 891,375 | 193,053 | 607,108 | 66,555 | 202,202 | 533,856 | 1,700,685 |
| Steelhead: 1-pound tall | 72 | 576 | | | | | 72 | 576 |
| Grand total | 2,539,008 | 10,167,698 | 1,681,554 | 8,652,949 | 1,183,249 | 10,276,221 | 5,403,811 | 29,096,868 |

*Pack of canned salmon, Pacific Coast States and Alaska, 1931, standard cases*—Con.

| Product | United States | | | | | | Grand total, Alaska and United States | |
|---|---|---|---|---|---|---|---|---|
| | Washington | | Oregon and California | | Total | | | |
| | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* | *Cases* | *Value* |
| Chinook or king: | | | | | | | | |
| 1-pound tall | 27,471 | $169,084 | 16,005 | $62,358 | 43,476 | $231,442 | 65,414 | $383,186 |
| 1-pound oval | 960 | 19,200 | 2,086 | 42,063 | 3,046 | 61,263 | 3,046 | 61,263 |
| 1-pound flat | 18,817 | 230,015 | 87,672 | 851,347 | 106,489 | 1,081,362 | 123,210 | 1,260,105 |
| ½-pound oval | 87 | 2,001 | 759 | 17,457 | 846 | 19,458 | 846 | 19,458 |
| ½-pound flat | 65,073 | 876,776 | 109,047 | 1,421,569 | 174,120 | 2,298,345 | 187,328 | 2,455,245 |
| ¼-pound flat | | | 1,158 | 30,762 | 1,158 | 30,762 | 1,158 | 30,762 |
| Total | 112,408 | 1,297,076 | 216,727 | 2,425,556 | 329,135 | 3,722,632 | 381,002 | 4,210,019 |
| Blueback, red or sockeye: | | | | | | | | |
| 1-pound tall | 1,803 | 17,128 | | | 1,803 | 17,128 | 1,596,901 | 14,422,220 |
| 1-pound flat | 4,629 | 60,177 | | | 4,629 | 60,177 | 45,631 | 465,058 |
| ½-pound flat | 87,282 | 1,346,238 | 2,245 | 35,920 | 89,527 | 1,382,158 | 147,705 | 2,158,273 |
| Total | 93,714 | 1,423,543 | 2,245 | 35,920 | 95,959 | 1,459,463 | 1,790,237 | 17,045,551 |
| Silver or coho: | | | | | | | | |
| 1-pound tall | 46,915 | 333,069 | 2,012 | 12,474 | 48,927 | 345,543 | 205,941 | 1,324,515 |
| 1-pound flat | 21,032 | 159,748 | 14,801 | 112,488 | 35,833 | 272,236 | 38,735 | 294,145 |
| ½-pound flat | 14,839 | 135,593 | 7,612 | 66,986 | 22,451 | 202,579 | 32,413 | 308,332 |
| ¼-pound oval | 67 | 1,206 | | | 67 | 1,206 | 67 | 1,206 |
| ¼-pound flat | 2,151 | 27,963 | 5,072 | 65,936 | 7,223 | 93,899 | 7,223 | 93,899 |
| Total | 85,004 | 657,579 | 29,497 | 257,884 | 114,501 | 915,463 | 284,379 | 2,022,097 |
| Humpback or pink: | | | | | | | | |
| 1-pound tall | 663,698 | 2,256,573 | | | 663,698 | 2,256,573 | 3,566,624 | 12,195,537 |
| 1-pound flat | 2,887 | 10,393 | | | 2,887 | 10,393 | 7,297 | 27,047 |
| ½-pound flat | 38,943 | 218,081 | | | 38,943 | 218,081 | 85,467 | 477,961 |
| Total | 705,528 | 2,485,047 | | | 705,528 | 2,485,047 | 3,659,388 | 12,700,545 |
| Chum or keta: | | | | | | | | |
| 1-pound tall | 67,152 | 212,549 | 11,463 | 34,575 | 78,615 | 247,124 | 608,194 | 1,926,012 |
| 1-pound flat | | | | | | | 35 | 140 |
| ½-pound flat | 199 | 995 | | | 199 | 995 | 4,441 | 22,652 |
| Total | 67,351 | 213,544 | 11,463 | 34,575 | 78,814 | 248,119 | 612,670 | 1,948,804 |
| Steelhead: | | | | | | | | |
| 1-pound tall | 80 | 480 | | | 80 | 480 | 152 | 1,056 |
| 1-pound flat | 1,438 | 10,066 | 1,479 | 10,353 | 2,917 | 20,419 | 2,917 | 20,419 |
| ½-pound oval | 1,766 | 30,375 | 3,093 | 53,200 | 4,859 | 83,575 | 4,859 | 83,575 |
| ½-pound flat | 1,392 | 15,312 | 2,782 | 30,602 | 4,174 | 45,914 | 4,174 | 45,914 |
| ¼-pound oval | | | 130 | 2,730 | 130 | 2,730 | 130 | 2,730 |
| ¼-pound flat | 62 | 1,116 | 75 | 1,350 | 137 | 2,466 | 137 | 2,466 |
| Total | 4,738 | 57,349 | 7,559 | 98,235 | 12,297 | 155,584 | 12,369 | 156,160 |
| Grand total | 1,068,743 | 6,134,138 | 267,491 | 2,852,170 | 1,336,234 | 8,986,308 | 6,740,045 | 38,083,176 |

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of 1-pound cans, 48 to the case. Salmon were canned at 34 plants in Washington, 11 in Oregon, 5 in California, and 116 in Alaska.

*Pack of canned sardines, 1931*

| Sardine (herring) | Maine | | Sardine (pilchard) | California | |
|---|---|---|---|---|---|
| | Cases | Value | | Cases | Value |
| Quarters, ¼-pound (100 cans): | | | ½-pound oval (48 cans): | | |
| In olive oil | 1,771 | $10,802 | In tomato sauce | 22,440 | $53,285 |
| In cottonseed oil | 789,499 | 2,386,728 | In other sauces or oils | 771 | 7,479 |
| In mustard | 39,154 | 138,044 | 1-pound oval (48 cans): | | |
| In tomato sauce | 4,224 | 15,736 | In tomato sauce | 1,330,257 | 3,536,204 |
| Three-quarters, ¾-pound (48 cans): In mustard | 35,250 | 95,877 | In cottonseed oil | 13,756 | 38,524 |
| | | | In mustard | 111,683 | 293,964 |
| | | | In natural oil | 28,441 | 72,971 |
| | | | In other sauces or oils | 9,284 | 22,226 |
| | | | ¼-pound square (100 cans): | | |
| | | | In various sauces or oils | 1,656 | 13,646 |
| | | | 5-ounce (100 cans): | | |
| | | | In natural oil | 125,821 | 353,635 |
| | | | In other sauces or oils | 4,024 | 11,267 |
| | | | 6-ounce (100 cans): In miscellaneous sauces or oils | 29,967 | 79,778 |
| | | | 1-pound tall (48 cans): | | |
| | | | In natural oil | 85,758 | 200,840 |
| | | | In other sauces or oils | 12,360 | 27,495 |
| | | | Other sizes, various sauces or oils (standard cases) | 1,460 | 3,775 |
| Total | 869,898 | 2,647,187 | Total | 1,777,678 | 4,715,089 |
| Total (standard cases) | 885,408 | | Total (standard cases) | 1,713,407 | |

NOTE.—"Standard cases" represent the various sized cases converted to the uniform basis of ¼-pound cans, 100 to case, of sardines (herring), and 1-pound cans, 48 to the case, of sardines (pilchard). Sardines were canned at 27 plants in Maine and 22 in California.

*Pack of canned tuna and tunalike fishes in California, 1931*

| Size | Albacore | | Yellowfin | | Bluefin | | Striped | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| ¼-pound (48 cans) | [1] 9,813 | $50,666 | 106,530 | $456,764 | 1,231 | $3,770 | 26,979 | $95,411 |
| ¼-pound (100 cans) | | | 10,227 | 76,096 | 9,920 | 72,176 | 9,497 | 65,989 |
| ½-pound (48 cans) | 111,900 | 798,206 | 427,389 | 2,703,344 | 23,145 | 121,487 | 173,043 | 863,546 |
| 1-pound (48 cans) | [2] 14,506 | 193,268 | [2] 51,773 | 582,206 | [2] 3,855 | 34,894 | 14,528 | 119,431 |
| Flakes (standard cases) | 11,840 | 53,525 | 56,671 | 236,151 | 5,092 | 20,596 | 12,043 | 48,945 |
| Total | 148,059 | 1,095,665 | 652,590 | 4,054,561 | 43,243 | 252,923 | 236,090 | 1,193,322 |
| Total (standard cases) | 157,658 | | 651,523 | | 46,895 | | 237,524 | |

| Size | "Tonno" | | Bonito | | Yellowtail | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| ¼-pound (48 cans) | | | 222 | $610 | | | 144,775 | $607,221 |
| ¼-pound (100 cans) | 56,259 | $381,858 | 14,520 | 96,021 | 354 | $1,947 | 100,777 | 694,087 |
| ½-pound (48 cans) | [3] 8,087 | 53,129 | 14,332 | 59,288 | 408 | 1,684 | 758,304 | 4,600,684 |
| 1-pound (48 cans) | | | 11,201 | 74,349 | 1,241 | 9,237 | 97,104 | 1,013,385 |
| Flakes (standard cases) | | | 1,423 | 4,665 | 38 | 133 | 87,107 | 364,015 |
| Total | 64,346 | 434,987 | 41,698 | 234,933 | 2,041 | 13,001 | 1,188,067 | 7,279,392 |
| Total (standard cases) | 66,687 | | 53,392 | | 3,297 | | 1,216,976 | |

[1] Includes the pack in ⅛-pound jars, 96 to the case and 7-ounce jars, 24 to the case, which have been converted to the equivalent of ¼-pound cans, 48 to the case.

[2] Includes the pack in 4-pound cans, 12 to the case, which have been converted to the equivalent of 1-pound cans, 48 to the case.

[3] Includes the pack in ½-pound cans, 50 the case, which have been converted to the equivalent of ½-pound cans, 48 to the case.

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of forty-eight ½-pound cans to the case. Tuna and tunalike fishes were canned in 15 plants in California.

*Pack of canned alewives and alewife roe, 1931*

STANDARD CASES

| Product | Maryland | | Virginia | | North Carolina | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| Alewives | 17,650 | $41,155 | 16,970 | $37,818 | | | 34,620 | $78,973 |
| Alewife roe | 7,896 | 35,416 | 21,270 | 83,264 | 3,574 | $13,393 | 32,740 | 132,073 |
| Total | 25,546 | 76,571 | 38,240 | 121,082 | 3,574 | 13,393 | 67,360 | 211,046 |

ACTUAL CASES

| Product and size | Cases | Value |
|---|---|---|
| Alewives: | | |
| 16-ounce (48 cans) | 17,519 | $39,034 |
| 17-ounce (24 cans) | 4,206 | 5,423 |
| 15 and 19-ounce (24 cans) | 28,763 | 34,516 |
| Total | | 78,973 |
| Alewife roe: | | |
| 7½, 8, and 8½-ounce (48 cans) | 9,181 | 30,438 |
| 16-ounce (24 cans) | 3,278 | 5,851 |
| 17-ounce (24 cans) | 41,341 | 79,279 |
| 19-ounce (24 cans) | 5,746 | 12,037 |
| Other sizes (standard cases) | 997 | 4,468 |
| Total | | 132,073 |
| Grand total | | 211,046 |

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of 1-pound cans, 48 to the case. Alewives or alewife roe were canned at 8 plants in Maryland, 20 in Virginia, and 3 in North Carolina.

*Pack of canned shrimp, 1931*

STANDARD CASES

| State | Dry pack (in tins) | | Wet pack (in tins) | | Wet pack (in glass)[1] | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Cases | Value | Cases | Value | Cases | Value | Cases | Value |
| South Carolina and Alabama | 10,946 | $48,677 | 46,315 | $216,317 | | | 57,261 | $264,994 |
| Georgia | 16,551 | 85,101 | 41,945 | 222,411 | | | 58,496 | 307,512 |
| Florida | 2,203 | 11,530 | 31,755 | 165,833 | 14,235 | $135,569 | 48,193 | 312,932 |
| Mississippi | 60,194 | 243,140 | 141,765 | 548,813 | | | 201,959 | 791,953 |
| Louisiana | 85,054 | 429,004 | 278,193 | 1,336,583 | | | 363,247 | 1,765,587 |
| Texas | 7,305 | 35,938 | 58,564 | 264,779 | 15,820 | 142,408 | 81,689 | 443,125 |
| Georgia and Louisiana | | | | | 10,530 | 96,144 | 10,530 | 96,144 |
| Total | 182,253 | 853,390 | 598,537 | 2,754,736 | 40,585 | 374,121 | 821,375 | 3,982,247 |

[1] The pack of shrimp in glass for Georgia and Louisiana has been grouped to avoid the disclosure of private enterprise.

*Pack of canned shrimp, 1931*—Continued

ACTUAL CASES

| Size | Cases | Value |
|---|---|---|
| In tins, dry: | | |
| 4-ounce (48 cans) | 8,251 | $32,349 |
| 5-ounce (48 cans) | 153,212 | 687,965 |
| 8, 8¼, and 8½ ounce (24 cans) | 22,145 | 110,623 |
| Other sizes (standard cases) | 4,163 | 22,453 |
| In tins, wet: | | |
| 3¾, 4, and 5 ounce (48 cans) | 18,752 | 91,129 |
| 5¼-ounce (48 cans) | 571,072 | 2,583,495 |
| 8¼ to 9¾ ounce (24 cans) | 6,341 | 28,412 |
| Other sizes (standard cases) | 7,141 | 51,700 |
| In glass, wet: | | |
| 5¼-ounce (24 cans) | 75,802 | 330,298 |
| 5¾-ounce (24 cans) | 7,333 | 21,408 |
| Other sizes (standard cases) | 2,315 | 22,415 |
| Total | | 3,982,247 |

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of 5-ounce cans, 48 to the case, in the dry pack and 5¾-ounce cans, 48 to the case, in the wet pack. Shrimp were canned at 2 plants in South Carolina, 5 in Georgia, 6 in Florida, 2 in Alabama, 15 in Mississippi, 19 in Louisiana, and 6 in Texas.

*Pack of canned oysters, 1931*

STANDARD CASES

| State | Cases | Value | State | Cases | Value |
|---|---|---|---|---|---|
| North Carolina, Georgia, and Florida | 16,388 | $50,218 | Louisiana | 24,415 | $85,278 |
| South Carolina | 74,186 | 224,248 | Washington | 7,930 | 40,805 |
| Alabama | 23,551 | 75,332 | Total | 306,278 | 963,525 |
| Mississippi | 159,808 | 487,644 | | | |

ACTUAL CASES

| Size | Cases | Value |
|---|---|---|
| 4-ounce (48 cans) | 37,388 | $102,233 |
| 5-ounce (48 cans) | 219,521 | 669,512 |
| 6-ounce (48 cans) | 2,717 | 13,653 |
| 8-ounce (24 cans) | 22,557 | 74,892 |
| 10-ounce (24 cans) | 35,543 | 103,235 |
| Total | | 963,525 |

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of 5-ounce cans, 48 to the case. Oysters were canned at 1 plant in North Carolina, 7 in South Carolina, 2 in Georgia, 2 in Florida, 3 in Alabama, 16 in Mississippi, 8 in Louisiana, and 4 in Washington. The pack during the spring period (January to May, 1931) amounted to 238,850 standard cases, valued at $757,468 and that during the fall period (September to December, 1931) amounted to 67,428 standard cases, valued at $206,057. The pack during the spring period of 1930 amounted to 333,174 standard cases, valued at $1,605,647 and during the fall period of 1930, 63,000 standard cases, valued at $231,215.

*Pack of canned clams and clam products, 1931*

| Item and State | Cases | Value |
|---|---|---|
| Razor clams (Washington, Oregon, and Alaska): | | |
| Whole— | | |
| No. 1, 5-ounce (48 cans) | 3,819 | $37,808 |
| No. 2, 10-ounce (24 cans) | 140 | 1,260 |
| Other sizes (standard cases) | 104 | 822 |
| Minced— | | |
| ½-pound flat, 4-ounce (48 cans) | 61,254 | 427,428 |
| No. 1, 5-ounce (48 cans) | 20,712 | 176,058 |
| No. 2, 10-ounce (24 cans) | 1,056 | 9,188 |
| Other sizes (standard cases) | 2,307 | 21,873 |
| Juice—All sizes (standard cases) | 364 | 1,120 |
| Total | 89,756 | 675,557 |
| Total (standard cases) | 77,505 | |
| Hard clams (Rhode Island, New York, New Jersey, Georgia, Florida, Washington, and Alaska):[1] | | |
| Whole— | | |
| No. 1, 5-ounce (48 cans) | 4,670 | 39,833 |
| 1-pound 8-ounce (48 cans) | 3,133 | 21,751 |
| No. 2, 10-ounce (24 cans) | 7,700 | 48,312 |
| No. 10, 52-ounce (6 cans) | 4,250 | 21,250 |
| Other sizes (standard cases) | 763 | 3,879 |
| Minced— | | |
| No. 1, 5-ounce (48 cans) | 908 | 6,801 |
| No. 2, 10-ounce (24 cans) | 1,483 | 10,383 |
| Other sizes (standard cases) | 5,997 | 38,787 |
| Chowder— | | |
| No. 1, 10-ounce (48 cans) | 163,857 | 604,266 |
| 33-ounce (24 jars) | 133 | 1,319 |
| Other sizes (standard cases) | 56,291 | 234,384 |
| Juice— | | |
| No. 1, 10-ounce (48 cans) | 527 | 1,716 |
| No. 10, 102-ounce (6 cans) | 1,697 | 5,489 |
| Other sizes (standard cases) | 3,223 | 17,625 |
| Cocktail— | | |
| 3 and 4 ounce (48 jars) | 1,092 | 7,374 |
| 8-ounce (24 jars) | 249 | 1,387 |
| Other sizes (standard cases) | 216 | 2,513 |
| Broth and bouillon— | | |
| 3½ and 4 ounce (48 jars) | 299 | 1,302 |
| 10-ounce (48 jars) | 1,148 | 6,411 |
| Other sizes (standard cases) | 3,082 | 16,311 |
| Total | 260,718 | 1,091,093 |
| Total (standard cases) | 263,377 | |
| Soft clams (Maine and Massachusetts): | | |
| Whole— | | |
| No. 1, 5-ounce (48 cans) | 66,333 | 240,763 |
| 1-pound 8-ounce (48 cans) | 7,945 | 46,734 |
| No. 2, 10-ounce (24 cans) | 10,159 | 34,473 |
| Other sizes (standard cases) | 9,501 | 20,793 |
| Chowder— | | |
| No. 1, 10-ounce (48 cans) | 17,082 | 53,850 |
| No. 2, 20-ounce (24 cans) | 1,132 | 3,923 |
| Other sizes (standard cases) | 27,180 | 54,898 |
| Bouillon and juice— | | |
| No. 2, 20-ounce (24 cans) | 5,788 | 10,419 |
| Other sizes (standard cases) | 8,951 | 24,400 |
| Total | 154,071 | 490,259 |
| Total (standard cases) | 159,158 | |
| Grand total (standard cases) | 500,040 | 2,256,909 |

[1] Includes a small amount of coquina broth packed in Florida.

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of 5-ounce cans, 48 No. 1 to the case, for whole and minced clams; and 48 No. 1, 10-ounce cans to the case, for other clam products. Razor clam products were canned at 12 plants in Washington, 5 in Oregon, and 6 in Alaska; hard clam products, at 1 plant in Rhode Island, 3 in New York, 1 in New Jersey, 1 in Georgia, 1 in Florida, 5 in Washington, and 1 in Alaska; soft clam products, at 21 plants in Maine and 2 in Massachusetts; and coquina clam products, at 2 plants in Florida.

*Pack of miscellaneous canned fishery products in the United States and Alaska, 1931*

| Item | Standard cases | Value | Item | Standard cases | Value |
|---|---|---|---|---|---|
| Mackerel | 102,392 | $246,848 | Salmon eggs (for bait) | 5,246 | $149,186 |
| Shad | 747 | 2,091 | Sturgeon caviar [2] | 4,630 | 609,502 |
| Shad roe | 2,100 | 63,060 | Whitefish roe and caviar | 829 | 23,498 |
| Fish flakes | 28,486 | 514,553 | Miscellaneous roe and caviar [3] | 1,966 | 13,896 |
| Fish cakes, balls, etc. | 103,704 | 779,411 | Crabs | 646 | 12,817 |
| Cat and dog food | 52,509 | 143,345 | Turtle products | 4,058 | 74,945 |
| Miscellaneous fish [1] | 7,425 | 63,974 | Miscellaneous shellfish [4] | 11,839 | 82,608 |
| Salmon roe and caviar | 3,360 | 30,486 | Total | 329,937 | 2,810,220 |

[1] Includes canned carp, eels, fillets, finnan haddie, smoked salmon, anchovy paste, halibut and salmon fish pudding, haddock chowder, and bait herring and candlefish.
[2] Produced principally from imported sturgeon.
[3] Includes canned fish roe from various species of ground fish and imported roe from fish other than sturgeon.
[4] Includes canned terrapin products, mussels, abalone, squid, and shrimp creole gumbo.

NOTE.—"Standard cases" represent the various sized cases converted to the equivalent of 1-pound cans, 48 to the case.

*Production of miscellaneous by-products, 1931*

| Product | Atlantic and Gulf coasts | | Pacific coast (including Alaska) | | Total | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Dried scrap: | | | | | | |
| Alewife ... tons | 515 | $19,113 | | | 515 | $19,113 |
| Crab, blue, and king ... do | 3,178 | 62,364 | | | 3,178 | 62,364 |
| Miscellaneous [1] ... do | 516 | 17,030 | | | 516 | 17,030 |
| Meal: | | | | | | |
| Herring (Alaska) ... do | | | 7,911 | $272,825 | 7,911 | 272,825 |
| Herring (Maine) ... do | 1,398 | 34,540 | | | 1,398 | 34,540 |
| Pilchard ... do | | | 16,319 | 610,462 | 16,319 | 610,462 |
| Salmon ... do | | | 2,435 | 108,682 | 2,435 | 108,682 |
| Tuna ... do | | | 5,078 | 169,505 | 5,078 | 169,505 |
| Ground fish ... do | 10,928 | 646,252 | | | 10,928 | 646,252 |
| Shrimp ... do | [2] 1,282 | [2] 24,985 | (2) | (2) | 1,282 | 24,985 |
| Miscellaneous [3] ... do | 1,466 | 58,535 | 2,376 | 119,411 | 3,842 | 177,946 |
| Miscellaneous green scrap [4] ... do | 917 | 4,757 | | | 917 | 4,757 |
| Oil: | | | | | | |
| Alewife ... gallons | 16,696 | 2,598 | | | 16,696 | 2,598 |
| Cod and cod-liver ... do | 95,809 | 62,600 | | | 95,809 | 62,600 |
| Herring (Alaska) ... do | | | 2,152,706 | 376,582 | 2,152,706 | 376,582 |
| Herring (Maine) ... do | 91,003 | 12,249 | | | 91,003 | 12,249 |
| Pilchard ... do | | | 3,916,336 | 807,647 | 3,916,336 | 807,647 |
| Salmon ... do | | | 250,871 | 41,129 | 250,871 | 41,129 |
| Tuna ... do | | | 15,939 | 3,296 | 15,939 | 3,296 |
| Miscellaneous [5] ... do | 8,470 | 5,705 | 36,031 | 5,822 | 44,501 | 11,527 |
| Liquid glue ... do | [6] 433,030 | [6] 1,043,290 | (6) | (6) | 433,030 | 1,043,290 |
| Miscellaneous by-products [7] ... pounds | 404,630 | 34,860 | 32,304 | 365,407 | 436,934 | 400,267 |
| Total | | 2,028,878 | | 2,880,768 | | 4,909,646 |

[1] Includes ground fish and miscellaneous dried scrap.
[2] A small quantity of shrimp meal produced in California is included with the production of the Atlantic and Gulf coasts.
[3] Includes king crab meal, clam meal, mackerel meal, salmon egg and liver meal, fish flour, and miscellaneous meal.
[4] Includes herring pomace (Maine), herring waste (Maine), and miscellaneous green scrap.
[5] Includes tanners oil, shark oil, mackerel oil, and miscellaneous oil.
[6] A quantity of liquid glue produced by one firm in California is included with the production of the Atlantic and Gulf coasts.
[7] Includes herring skins and scales, fish scale ornaments, shark skins and fins, ground clam shells, agar-agar and kelp products.

NOTE.—The oils produced on the Pacific coast are reported in trade gallons (7½ pounds) and those produced on the Atlantic and Gulf coasts are reported in United States gallons (about 7.74 pounds).

*Production of oyster-shell products, 1931*

| State | Crushed oyster shell for poultry feed | | Oyster-shell lime | | Total | |
|---|---|---|---|---|---|---|
| | Tons | Value | Tons | Value | Tons | Value |
| Rhode Island and New Jersey | 6,700 | $69,270 | 1,760 | $7,620 | 8,460 | $76,890 |
| Pennsylvania | 4,123 | 44,822 | 1,453 | 6,166 | 5,576 | 50,988 |
| Maryland | 34,045 | 235,024 | 15,593 | 32,668 | 49,638 | 267,692 |
| Virginia | 19,941 | 175,669 | [1] 23,702 | 149,370 | 43,643 | 325,039 |
| North Carolina and South Carolina | 7,263 | 66,193 | 525 | 2,670 | 7,788 | 68,863 |
| Florida and California | 47,204 | 252,952 | 2,215 | 7,869 | 49,419 | 260,821 |
| Alabama and Texas | 7,824 | 48,381 | 1,075 | 925 | 8,899 | 49,306 |
| Mississippi | 32,801 | 224,200 | 1,855 | 1,000 | 34,656 | 225,200 |
| Louisiana | 93,729 | 654,027 | 4,421 | 13,198 | 98,150 | 667,225 |
| Total | 253,630 | 1,770,538 | 52,599 | 221,486 | 306,229 | 1,992,024 |

[1] Of this amount, 11,207 tons, valued at $85,884, were reported as "burned" lime.

NOTE.—Crushed oyster-shell products were prepared at 2 plants in Rhode Island, 5 in New Jersey, 5 in Pennsylvania, 6 in Maryland, 8 in Virginia, 3 in North Carolina, 4 in South Carolina, 3 in Florida, 2 in Alabama, 6 in Mississippi, 4 in Louisiana, 1 in Texas, and 3 in California.

*Production of fresh-water mussel-shell products, 1931*

| Item | Iowa | | New York | | Other States | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| Pearl buttons ... gross | 11,088,981 | $3,356,426 | 4,517,622 | $1,116,894 | 1,081,893 | $267,494 | 16,688,496 | $4,740,814 |
| Crushed shell for poultry feed ... tons | 9,871 | 90,661 | | | 305 | 2,353 | 10,176 | 93,014 |
| Lime ... do | 9,091 | 9,091 | (1) | (1) | [1] 267 | [1] 486 | 9,358 | 9,577 |
| Other products [2] | | 126,835 | | | | | | 126,835 |
| Total | | 3,583,013 | | 1,116,894 | | 270,333 | | 4,970,240 |

[1] A small production made in New York has been included with "Other States."
[2] Includes stucco, colored shells, and "pearl novelties."

*Production of marine pearl-shell products,[1] 1931*

| Item | Maine, Massachusetts, and Connecticut | | Rhode Island | | New York | | New Jersey | |
|---|---|---|---|---|---|---|---|---|
| | Gross | Value | Gross | Value | Gross | Value | Gross | Value |
| Pearl buttons | 1,328,513 | $964,520 | | | 98,764 | $100,295 | 1,310,536 | $1,017,334 |
| Novelties [2] | | 103,845 | | $18,067 | | 37,848 | | 322,329 |
| Total | | 1,068,365 | | 18,067 | | 138,143 | | 1,339,663 |

| Item | Pennsylvania, Maryland, and Florida | | California | | Total | |
|---|---|---|---|---|---|---|
| | Gross | Value | Gross | Value | Gross | Value |
| Pearl buttons | 1,741,650 | $801,515 | | | 4,479,463 | $2,883,664 |
| Novelties [2] | | 148,777 | | $38,373 | | 669,239 |
| Total | | 950,292 | | 38,373 | | 3,552,903 |

[1] Produced principally from imported shells.
[2] Includes buckles, inlays for jewelry, knife handles, lamps, handles for manicure sets, ornaments, etc.

NOTE.—Marine pearl-shell products were manufactured at 1 plant in Maine, 2 in Massachusetts, 3 in Rhode Island, 6 in Connecticut, 10 in New York, 23 in New Jersey, 3 in Pennsylvania, 1 in Maryland, 3 in Florida, and 3 in California.

*Fish utilized and products of the menhaden industry, 1931*

| State | Menhaden utilized | Products | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Dry scrap and meal | | Acidulated scrap | | Oil | | Total |
| | *Number* | *Tons* | *Value* | *Tons* | *Value* | *Gallons* | *Value* | *Value* |
| New Jersey, Delaware, South Carolina, and Georgia | 69, 540, 000 | 2, 140 | $83, 812 | 6, 487 | $94, 181 | 397, 028 | $63, 891 | $241, 884 |
| Virginia | 155, 801, 000 | 11, 373 | 366, 107 | | | 1, 122, 974 | 169, 471 | 535, 578 |
| North Carolina | 45, 099, 000 | 2, 747 | 92, 417 | 805 | 14, 449 | 283, 656 | 40, 165 | 147, 031 |
| Florida | 82, 444, 000 | 4, 833 | 159, 205 | 1, 419 | 27, 763 | 178, 129 | 28, 781 | 215, 749 |
| Total | [1] 352, 884, 000 | [2] 21, 093 | 701, 541 | 8, 771 | 136, 393 | 1, 981, 790 | 302, 308 | 1, 140, 242 |

[1] 211,730,400 pounds.
[2] Of this quantity 18,185 tons, valued at $586,413, were reported as dry scrap, and 2,908 tons, valued at $115,128, as fish meal.

NOTE.—The menhaden factories were located as follows: 2 in New Jersey, 1 in Delaware, 8 in Virginia, 9 in North Carolina, 1 in South Carolina, 1 in Georgia, and 5 in Florida.

## PACKAGED-FISH TRADE

In 1931, the production of fresh, frozen, and smoked packaged fish in the United States amounted to 65,550,700 pounds, valued at $9,223,507. The most important species packaged was haddock, which alone accounted for 42,976,541 pounds valued at $6,095,930.

*Production of fresh, frozen, and smoked packaged fish in the United States, 1931*

| Species | Maine | | Massachusetts and Connecticut | | New York | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | | | | | 172, 400 | $36, 537 |
| Cod | 350, 426 | $55, 079 | 6, 797, 265 | $834, 253 | 2, 247, 346 | 330, 703 |
| Cusk | 209, 025 | 34, 850 | 1, 275, 566 | 188, 939 | | |
| Flounders, including "sole" | (1) | (1) | [1] 929, 545 | [1] 190, 149 | 511, 080 | 90, 670 |
| Haddock | 426, 439 | 70, 257 | 39, 480, 663 | 5, 570, 200 | 2, 879, 939 | 427, 187 |
| Hake | 292, 295 | 38, 168 | 1, 944, 252 | 214, 129 | 1, 425, 293 | 166, 936 |
| Halibut | | | 474, 973 | 85, 343 | | |
| Mackerel | | | [2] 136, 063 | [2] 23, 869 | | |
| Pollock | | | 445, 923 | 43, 422 | | |
| Salmon | | | 222, 033 | 41, 242 | | |
| Wolffish | | | 199, 554 | 23, 603 | | |
| Yellow perch | | | | | (4) | (4) |
| Miscellaneous [3] | | | 1, 161, 177 | 89, 154 | | |
| Total | 1, 278, 185 | 198, 354 | 53, 067, 014 | 7, 304, 303 | 7, 236, 058 | 1, 052, 033 |

| Species | Pennsylvania | | Virginia and North Carolina | | Florida, Alabama, and Texas | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | 649, 393 | $124, 999 | | | | |
| Croaker | | | 49, 170 | $5, 593 | | |
| Drum, red or redfish | | | | | 8, 200 | $1, 568 |
| Flounders, including "sole" | | | 37, 900 | 5, 393 | | |
| Groupers | | | | | 154, 000 | 22, 200 |
| Haddock | | | 189, 500 | 28, 286 | | |
| Mullet | | | | | 19, 000 | 2, 800 |
| Sea bass | | | 27, 030 | 4, 157 | | |
| Snapper, red | | | | | [5] 149, 553 | [5] 28, 822 |
| Spanish mackerel | | | | | 15, 500 | 3, 140 |
| Squeteague or "sea trout" | | | 597, 000 | 58, 048 | 24, 000 | 7, 160 |
| Yellow perch | [4] 41, 560 | [4] 8, 261 | | | | |
| Miscellaneous [6] | | | 11, 000 | 1, 021 | 35, 715 | 9, 483 |
| Total | 690, 953 | 133, 260 | 911, 600 | 102, 498 | 405, 968 | 75, 173 |

See footnotes at end of table.

*Production of fresh, frozen, and smoked packaged fish in the United States, 1931*—Continued

| Species | Ohio, Illinois, Minnesota, and Wisconsin | | California and Washington | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | 703,922 | $136,305 | | | 1,525,715 | $297,841 |
| Cod | | | | | 9,395,037 | 1,220,035 |
| Croaker | | | | | 49,170 | 5,593 |
| Cusk | | | | | 1,484,591 | 223,789 |
| Drum, red or redfish | | | | | 8,200 | 1,568 |
| Flounders, including "sole" | | | | | 1,478,525 | 286,212 |
| Groupers | | | | | 154,000 | 22,200 |
| Haddock | | | | | 42,976,541 | 6,095,930 |
| Hake | | | | | 3,661,840 | 419,233 |
| Halibut | | | 142,000 | $20,000 | 616,973 | 105,343 |
| Mackerel | | | (2) | (2) | 136,063 | 23,869 |
| Mullet | | | | | 19,000 | 2,800 |
| Pollock | | | | | 445,923 | 43,422 |
| Salmon | | | 80,000 | 10,150 | 302,033 | 51,392 |
| Sea bass | | | | | 27,030 | 4,157 |
| Snapper, red | | | (3) | (3) | 149,553 | 28,822 |
| Spanish mackerel | | | | | 15,500 | 3,140 |
| Squeteague or "sea trout" | | | | | 621,000 | 65,208 |
| Wolffish | | | | | 199,554 | 23,603 |
| Yellow perch | 826,945 | 156,718 | | | 868,505 | 164,979 |
| Yellow pike | 24,000 | 5,100 | | | 24,000 | 5,100 |
| Miscellaneous [5] | 35,690 | 6,255 | 148,365 | 23,358 | 1,391,947 | 129,271 |
| Total | 1,590,557 | 304,378 | 370,365 | 53,508 | [6] 65,550,700 | [6] 9,223,507 |

[1] A small amount of flounders in Maine has been included with Massachusetts and Connecticut.
[2] A small amount of mackerel in California has been included with Massachusetts and Connecticut.
[3] A small amount of red snapper in Washington has been included with Florida, Alabama, and Texas.
[4] A small amount of yellow perch in New York has been included with Pennsylvania.
[5] Includes amberfish, bluefish, butterfish, cabio, frog legs, jewfish, lake herring, lake trout, "lingcod," mangrove snapper, pinfish, pompano, sablefish, sauger pike, sheepshead, snook, spots, swordfish, tripletail, whitefish, whiting, and a small amount of mixed fish.
[6] Of this amount 61,928,737 pounds, valued at $8,761,731, were fillets; 1,142,521 pounds, valued at $154,895, were dressed or pan dressed; 1,837,224 pounds, valued at $204,386, were sticks; 495,193 pounds, valued at $77,271, were steaks; and 147,025 pounds, valued at $25,224, were prepared by other methods. Of the total quantity of fillets prepared 44,437,899 pounds, valued at $6,364,430, were fresh; 15,451,637 pounds, valued at $2,071,684, were frozen; and 2,039,201 pounds, valued at $325,617, were smoked. Of the dressed and pan dressed 596,229 pounds, valued at $63,768, were fresh; 502,308 pounds, valued at $84,529, were frozen; and 43,984 pounds, valued at $6,598, were smoked. Of the sticks, 686,680 pounds, valued at $117,844, were fresh; and 1,150,544 pounds, valued at $86,542, were frozen. Of the steaks, 62,000 pounds, valued at $14,620, were fresh and 433,193 pounds, valued at $62,651, were frozen. There were prepared by other methods 147,025 pounds, valued at $25,224.

NOTE.—Fish products were packaged at 6 plants in Maine; 58 in Massachusetts; 35 in New York; 1 in Connecticut; 8 in Pennsylvania; 6 in Virginia; 1 in North Carolina; 7 in Florida; 1 in Alabama; 23 in Ohio; 1 in Illinois; 1 in Minnesota; 2 in Wisconsin; 3 in California; and 5 in Washington—a total of 158 plants.

## FROZEN-FISH TRADE

### FISH FROZEN

In 1931 the freezing plants in the United States and Alaska, reporting their activities to the Government, packed 112,257,416 pounds of frozen fishery products. These products at the time they were held in cold-storage plants were estimated to be valued at $11,000,000. Compared with the pack in 1930, which was the largest frozen pack of fishery products on record, this is a decrease of 19 per cent in the volume of the pack. Over 60 per cent of the pack consisted of six groups of fishery products. Of first importance was the cod, haddock, haddock fillets, hake, and pollock group with 14 per cent of the total. Haddock fillets accounted for the bulk of the volume of this group. Of next importance were the salmons and halibut, each with 12 per cent of the total. Mackerel made up 11 per cent of the total; whiting, 7 per cent; and sea herring, 6 per cent. Considerable quantities of shellfish; weakfish, including southern

"sea trout"; cisco or lake herring; butterfish; and squid, also were frozen. Frozen squid and sea herring are marketed primarily for bait, although quantities of each are used for human consumption.

*Production of frozen fishery products, 1931*

BY SPECIES AND MONTHS

| Species | Month ended the 15th of— | | | | | | |
|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 10,672 | 14,313 | 8,013 | 2,574 | 20,965 | 11,968 | 7,098 |
| Butterfish (all trade sizes) | 9,110 | 8,986 | 2,419 | 3,643 | 35,965 | 496,044 | 222,197 |
| Catfish | 45,135 | 18,655 | 10,861 | 3,831 | 84,679 | 66,645 | 82,324 |
| Cisco (Lake Erie) | 15,620 | ---------- | ---------- | ---------- | 929 | 362 | 7,641 |
| Cisco (lake herring), including bluefin, blackfin, and chub | 88,429 | 102,893 | 22,354 | 4,393 | 20,952 | 47,616 | 48,726 |
| Cisco (tullibees, Canadian lakes) | 45,508 | 65,356 | 42,653 | 2,097 | 22,976 | 1,741 | 18,448 |
| Cod, haddock, hake, pollock | 256,763 | 45,732 | 72,695 | 98,060 | 113,987 | 91,578 | 174,754 |
| Croaker | 6,028 | 10,570 | 42,144 | 6,508 | 528,525 | 173,570 | 155,249 |
| Flounders | 53,818 | 7,179 | 12,717 | 11,656 | 198,399 | 292,991 | 98,302 |
| Haddock fillets | 650,238 | 455,758 | 363,271 | 1,576,376 | 1,749,624 | 1,103,885 | 1,560,296 |
| Halibut (all trade sizes) | 339,931 | 213,250 | 59,716 | 275,795 | 2,459,219 | 2,140,703 | 2,357,612 |
| Herring, sea (including alewives and bluebacks) | 124,435 | 43,093 | 51,715 | 168,644 | 963,268 | 467,725 | 361,740 |
| Lake trout | 20,762 | 7,623 | 3,561 | 93,902 | 50,356 | 23,403 | 82,583 |
| Mackerel (except Spanish) | 149,693 | 162,449 | 103,755 | 99,314 | 48,507 | 776,093 | 2,507,914 |
| Pike, blue and sauger | 28,232 | 2,639 | 5,292 | 2,728 | 429,975 | 130,241 | 36,088 |
| Pike, yellow or wall-eyed | 59,546 | 57,987 | 26,895 | 57,248 | 55,640 | 23,493 | 20,480 |
| Pike (including pickerel, jacks, and yellow jack) | 51,917 | 58,091 | 46,352 | 34,234 | 54,175 | 15,499 | 20,171 |
| Sablefish (black cod) | 18,474 | 140,032 | 11,283 | 9,774 | 48,667 | 29,316 | 91,762 |
| Salmon, chinook | 420 | 6,782 | 4,758 | 2,170 | 122,208 | 113,365 | 389,876 |
| Salmon, silver | 71,945 | 99,149 | 36,763 | 19,344 | 28,232 | 46,408 | 86,312 |
| Salmon, fall and pink | 53,304 | 48,827 | 20,858 | 16,135 | 14,517 | 41,485 | 16,010 |
| Salmon, steelhead trout | 57,190 | 770 | 7,365 | 9,911 | 18,691 | 18,748 | 372,381 |
| Salmon, all other | 58,140 | 59,435 | 161,985 | 137,836 | 155,848 | 544,228 | 340,957 |
| Scup (porgies) | 3,052 | 1,243 | 4,238 | 297 | 3,075 | 156,834 | 48,412 |
| Shad and shad roe | 86,017 | 13,395 | 25,665 | 34,150 | 84,092 | 166,630 | 72,648 |
| Shellfish | 607,824 | 176,215 | 151,366 | 133,698 | 288,642 | 516,073 | 475,357 |
| Smelts, eulachon, etc | 316,396 | 380,248 | 285,680 | 42,715 | 3,007 | 9,078 | 5,919 |
| Squid | 17,791 | 6,566 | 2,767 | 95,824 | 292,205 | 890,960 | 142,323 |
| Sturgeon and spoonbill cat | 68,483 | 4,715 | 1,572 | 9,530 | 43,656 | 112,233 | 70,484 |
| Suckers | 18,905 | 6,929 | ---------- | 440 | 22,269 | 4,943 | 11,920 |
| Weakfish (including southern "sea trout") | 24,205 | 75,452 | 70,745 | 32,981 | 157,565 | 215,779 | 45,153 |
| Whitefish | 83,442 | 44,251 | 56,904 | 10,862 | 79,587 | 86,838 | 208,412 |
| Whiting | 96,484 | 249,117 | 279,717 | 330,770 | 131,683 | 2,782,800 | 1,983,218 |
| Miscellaneous fish | 768,512 | 572,420 | 493,794 | 653,797 | 1,522,864 | 1,360,620 | 1,204,694 |
| Total | 4,306,421 | 3,160,120 | 2,489,873 | 3,980,966 | 9,864,949 | 12,959,901 | 13,327,461 |

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | August | September | October | November | December | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 246,005 | 314,737 | 401,153 | 169,072 | 27,998 | 1,234,568 |
| Butterfish (all trade sizes) | 300,713 | 197,986 | 148,744 | 519,711 | 167,963 | 2,113,301 |
| Catfish | 45,359 | 90,523 | 101,960 | 65,812 | 58,455 | 674,239 |
| Cisco (Lake Erie) | 43,521 | 40,127 | 15,910 | 45,986 | 66,429 | 236,525 |
| Cisco (lake herring), including bluefin, blackfin, and chub | 117,178 | 84,072 | 195,187 | 681,730 | 897,785 | 2,311,315 |
| Cisco (tullibees, Canadian lakes) | 20,609 | 18,007 | 18,905 | 35,812 | 44,538 | 336,645 |
| Cod, haddock, hake, pollock | 410,836 | 201,670 | 481,146 | 431,669 | 452,096 | 2,830,986 |
| Croaker | 417,140 | 247,826 | 58,183 | 47,033 | 11,065 | 1,703,841 |
| Flounders | 44,637 | 85,453 | 156,813 | 98,174 | 94,938 | 1,154,986 |
| Haddock fillets | 1,656,055 | 1,277,577 | 940,073 | 665,155 | 945,489 | 12,943,797 |
| Halibut (all trade sizes) | 2,480,697 | 1,447,465 | 572,764 | 431,831 | 200,709 | 12,979,692 |
| Herring, sea (including alewives and bluebacks) | 1,050,573 | 825,881 | 942,705 | 1,691,225 | 452,184 | 7,143,188 |
| Lake trout | 35,033 | 29,585 | 140,088 | 580,898 | 227,718 | 1,295,512 |
| Mackerel (except Spanish) | 1,745,618 | 5,041,176 | 1,291,930 | 284,915 | 140,972 | 12,352,336 |
| Pike, blue and sauger | 59,369 | 19,473 | 75,950 | 283,567 | 356,010 | 1,429,564 |
| Pike, yellow or wall-eyed | 7,007 | 10,155 | 108,567 | 63,709 | 43,040 | 533,767 |
| Pike (including pickerel, jacks, and yellow jack) | 25,842 | 3,316 | 75,568 | 78,697 | 35,656 | 499,518 |

*Production of frozen fishery products, 1931*—Continued

BY SPECIES AND MONTHS—Continued

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | August | September | October | November | December | Total |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Sablefish (black cod) | 155,108 | 179,543 | 368,641 | 473,652 | 224,031 | 1,750,283 |
| Salmon, chinook | 388,221 | 135,865 | 33,675 | 32,748 | 2,389 | 1,232,477 |
| Salmon, silver | 895,271 | 1,534,794 | 1,481,338 | 739,064 | 70,311 | 5,108,931 |
| Salmon, fall and pink | 387,609 | 159,511 | 82,997 | 1,226,023 | 82,279 | 2,149,555 |
| Salmon, steelhead trout | 630,273 | 298,125 | 55,035 | 11,517 | 5,160 | 1,485,160 |
| Salmon, all other | 575,117 | 481,704 | 237,341 | 234,280 | 47,488 | 3,034,359 |
| Scup (porgies) | 56,698 | 59,479 | 35,730 | 25,810 | 3,219 | 398,087 |
| Shad and shad roe | 114,756 | 41,283 | 41,638 | 65,603 | 20,677 | 766,554 |
| Shellfish | 219,617 | 390,320 | 607,655 | 1,160,985 | 982,730 | 5,710,482 |
| Smelts, eulachon, etc | 3,104 | 15,334 | 40,133 | 45,866 | 184,874 | 1,332,354 |
| Squid | 91,596 | 139,471 | 40,576 | 110,496 | 44,408 | 1,874,983 |
| Sturgeon and spoonbill cat | 23,484 | 19,719 | 29,238 | 18,365 | 8,091 | 409,570 |
| Suckers | 1,005 | 470 | 4,471 | 12,059 | 6,251 | 89,662 |
| Weakfish (including southern "sea trout") | 318,437 | 514,038 | 438,142 | 369,263 | 78,368 | 2,340,128 |
| Whitefish | 59,623 | 125,895 | 59,774 | 67,098 | 194,735 | 1,077,421 |
| Whiting | 610,948 | 318,720 | 591,971 | 393,733 | 141,983 | 7,911,144 |
| Miscellaneous fish | 983,014 | 1,273,676 | 1,416,281 | 1,807,838 | 1,754,964 | 13,812,480 |
| Total | 14,220,073 | 15,622,976 | 11,290,282 | 12,969,396 | 8,074,998 | 112,257,416 |

BY GEOGRAPHICAL SECTIONS AND SPECIES [1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Species | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| Bluefish (all trade sizes) | 30 | 1,120 | 12 | 70 | 2 | | | 1,234 |
| Butterfish (all trade sizes) | 390 | 1,638 | 49 | 34 | 2 | | | 2,113 |
| Catfish | 47 | 5 | 175 | 109 | 318 | 20 | | 674 |
| Cisco (Lake Erie) | | 237 | | | | | | 237 |
| Cisco (lake herring), including bluefin, blackfin, and chub | | 382 | | 1,407 | 522 | | | 2,311 |
| Cisco (tullibees, Canadian lakes) | 50 | 106 | 20 | 97 | 63 | 1 | | 337 |
| Cod, haddock, hake, pollock | 2,226 | 316 | 2 | 76 | 44 | 3 | 164 | 2,831 |
| Croaker | | 731 | 897 | 76 | | | | 1,704 |
| Flounders | 456 | 664 | 1 | 15 | | | 19 | 1,155 |
| Haddock fillets | 11,949 | 261 | 11 | 351 | 244 | 17 | 111 | 12,944 |
| Halibut (all trade sizes) | 254 | 604 | 2 | 931 | 90 | 1 | 11,098 | 12,980 |
| Herring, sea (including alewives and bluebacks) | 5,358 | 821 | 4 | 373 | | 2 | 1,085 | 7,143 |
| Lake trout | | 133 | 12 | 909 | 238 | 1 | 3 | 1,296 |
| Mackerel (except Spanish) | 10,599 | 1,267 | 1 | 124 | 26 | | 335 | 12,352 |
| Pike, blue and sauger | | 992 | | 383 | | 5 | 50 | 1,430 |
| Pike, yellow or wall-eyed | | 76 | | 174 | 284 | | | 534 |
| Pike (including pickerel, jacks, and yellow jack) | | 16 | | 113 | 371 | | | 500 |
| Sablefish (black cod) | | 1 | | 127 | 38 | | 1,584 | 1,750 |
| Salmon, Chinook | 16 | 15 | | 38 | 7 | | 1,156 | 1,232 |
| Salmon, silver | 34 | 235 | | 90 | 49 | | 4,701 | 5,109 |
| Salmon, fall and pink | 100 | 15 | | 66 | 64 | | 1,905 | 2,150 |
| Salmon, steelhead trout | 2 | 37 | 1 | 3 | | | 1,442 | 1,485 |
| Salmon, all other | 87 | 325 | 8 | 112 | 19 | | 2,483 | 3,034 |
| Scup (porgies) | 62 | 335 | | 1 | | | | 398 |
| Shad and shad roe | 251 | 256 | 4 | 61 | 2 | 2 | 191 | 767 |
| Shellfish | 497 | 2,392 | 849 | 838 | 272 | 9 | 853 | 5,710 |
| Smelts, eulachon, etc | 38 | 1,143 | | 59 | 4 | | 88 | 1,332 |
| Squid | 1,096 | 758 | | 9 | | | 12 | 1,875 |
| Sturgeon and spoonbill cat | | 194 | 10 | 22 | 58 | 98 | 28 | 410 |
| Suckers | | 1 | | 82 | | 7 | | 90 |
| Weakfish (including southern "sea trout") | | 2,085 | 255 | | | | | 2,340 |
| Whitefish | 24 | 398 | 28 | 580 | 47 | | | 1,077 |
| Whiting | 5,899 | 791 | 12 | 10 | 1,199 | | | 7,911 |
| Miscellaneous fish | 1,917 | 2,492 | 2,144 | 2,798 | 708 | 1,509 | 2,244 | 13,812 |
| Total | 41,382 | 20,342 | 4,497 | 10,138 | 4,671 | 1,675 | 29,552 | 112,257 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; Pacific—Washington, Oregon, California, and Alaska.

*Production of frozen fishery products, 1931*—Continued

BY GEOGRAPHICAL SECTIONS AND MONTHS [1]

[Expressed in thousands of pounds; that is, 000 omitted]

| Month ended the 15th of— | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific | Total |
|---|---|---|---|---|---|---|---|---|
| January | 992 | 1,344 | 298 | 708 | 333 | 113 | 518 | 4,306 |
| February | 470 | 1,061 | 69 | 370 | 490 | 58 | 642 | 3,160 |
| March | 277 | 1,011 | 12 | 200 | 406 | 112 | 472 | 2,490 |
| April | 1,687 | 560 | 23 | 287 | 542 | 93 | 789 | 3,981 |
| May | 2,947 | 1,695 | 416 | 954 | 457 | 256 | 3,130 | 9,855 |
| June | 5,658 | 2,574 | 283 | 832 | 344 | 217 | 3,052 | 12,960 |
| July | 6,648 | 1,239 | 433 | 724 | 299 | 286 | 3,699 | 13,328 |
| August | 5,727 | 1,309 | 770 | 475 | 271 | 60 | 5,608 | 14,220 |
| September | 8,266 | 1,820 | 535 | 367 | 261 | 61 | 4,313 | 15,623 |
| October | 4,199 | 2,488 | 310 | 1,029 | 251 | 147 | 2,866 | 11,290 |
| November | 2,685 | 3,376 | 459 | 1,885 | 684 | 159 | 3,721 | 12,969 |
| December | 1,826 | 1,865 | 889 | 2,307 | 335 | 113 | 742 | 8,075 |
| Total | 41,382 | 20,342 | 4,497 | 10,138 | 4,671 | 1,675 | 29,552 | 112,257 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; Pacific—Washington, Oregon, California, and Alaska.

## HOLDINGS

During 1931 the average monthly holdings of frozen fish and shellfish were 12 per cent less than the average monthly holdings during 1930, and 5 per cent greater than the 5-year average of monthly holdings. Individual monthly holdings during the year were above normal for 7 months of the year when compared with the 5-year average, being from less than 1 to 27 per cent higher. Compared with the respective monthly holdings in 1930, they were from 8 to 15 per cent greater during 4 months of the year, and 8 to 27 per cent less during the remaining 8 months of the year. Monthly holdings in 1931 were largest in January and from September to December, inclusive, being, in some instances, over double those for certain months from February to August, inclusive. A maximum of 74,725,000 pounds was held on November 15, and a minimum of 28,095,000 pounds on April 15. Holdings during the year averaged 54,999,000 pounds monthly.

*Holdings of frozen fishery products, by species and months, 1931*

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | January | February | March | April | May | June |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 514,141 | 403,792 | 240,335 | 134,267 | 119,865 | 100,588 |
| Butterfish (all trade sizes) | 534,291 | 366,585 | 169,185 | 79,589 | 55,300 | 521,562 |
| Catfish | 491,776 | 389,900 | 203,073 | 111,294 | 141,012 | 190,344 |
| Cisco (Lake Erie) | 275,251 | 245,672 | 99,781 | 61,335 | 45,151 | 41,227 |
| Cisco (lake herring), including bluefin, blackfin, and chub | 1,795,845 | 1,361,049 | 1,013,578 | 620,060 | 484,270 | 443,304 |
| Cisco (tullibees, Canadian lakes) | 1,294,644 | 1,218,217 | 812,210 | 474,664 | 534,572 | 688,762 |
| Cod, haddock, hake, pollock | 1,914,169 | 1,716,179 | 1,290,678 | 1,037,708 | 986,832 | 915,664 |
| Croaker | 919,201 | 591,923 | 221,291 | 126,622 | 609,136 | 755,777 |
| Flounders | 728,018 | 599,741 | 469,915 | 326,060 | 413,981 | 593,120 |
| Haddock fillets | 6,650,017 | 5,469,663 | 4,216,387 | 4,349,429 | 5,006,965 | 4,851,787 |
| Halibut (all trade sizes) | 7,223,395 | 4,665,669 | 2,422,259 | 2,196,011 | 4,188,499 | 6,110,776 |

*Holdings of frozen fishery products, by species and months, 1931*—Continued

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | January | February | March | April | May | June |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Herring, sea (including alewives and bluebacks) | 2,796,289 | 2,291,366 | 1,767,238 | 1,306,644 | 1,648,639 | 1,373,827 |
| Lake trout | 1,649,411 | 1,358,140 | 919,804 | 693,912 | 647,414 | 626,000 |
| Mackerel (except Spanish) | 4,781,239 | 3,333,710 | 1,834,634 | 574,224 | 489,709 | 1,141,368 |
| Pike, blue and sauger | 1,349,446 | 936,956 | 388,509 | 244,341 | 644,549 | 801,246 |
| Pike, yellow or wall-eyed | 531,545 | 531,066 | 338,815 | 338,214 | 349,569 | 332,096 |
| Pike (including pickerel, jacks, and yellow jack) | 373,099 | 552,150 | 484,205 | 444,077 | 339,892 | 349,267 |
| Sablefish (black cod) | 1,659,105 | 1,465,153 | 1,077,947 | 850,554 | 755,714 | 614,151 |
| Salmon, chinook | 1,443,991 | 1,108,282 | 659,155 | 421,734 | 444,849 | 482,145 |
| Salmon, silver | 3,481,184 | 2,377,032 | 1,029,002 | 556,329 | 342,932 | 343,642 |
| Salmon, fall and pink | 1,708,354 | 1,271,128 | 697,483 | 527,860 | 455,408 | 435,244 |
| Salmon, steelhead trout | 509,124 | 401,632 | 253,826 | 227,291 | 224,569 | 201,870 |
| Salmon, all other | 2,156,548 | 1,044,138 | 636,463 | 506,318 | 512,622 | 891,977 |
| Scup (porgies) | 516,332 | 426,441 | 287,220 | 47,845 | 32,862 | 182,055 |
| Shad and shad roe | 642,352 | 528,886 | 296,783 | 191,992 | 226,076 | 364,329 |
| Shellfish | 2,740,682 | 2,334,991 | 1,610,745 | 998,482 | 945,209 | 1,323,069 |
| Smelts, eulachon, etc | 804,898 | 972,478 | 1,207,839 | 488,468 | 419,154 | 400,278 |
| Squid | 2,021,826 | 1,668,707 | 1,229,775 | 687,483 | 737,914 | 1,582,234 |
| Sturgeon and spoonbill cat | 869,702 | 786,085 | 688,084 | 625,000 | 488,104 | 629,570 |
| Suckers | 121,675 | 101,209 | 88,532 | 68,420 | 63,754 | 68,191 |
| Weakfish (including southern "sea trout") | 1,976,996 | 1,321,749 | 559,304 | 78,663 | 212,630 | 399,125 |
| Whitefish | 1,359,770 | 1,319,975 | 1,249,596 | 753,946 | 617,918 | 608,143 |
| Whiting | 6,017,992 | 4,885,675 | 3,743,028 | 2,777,158 | 2,371,354 | 4,684,762 |
| Miscellaneous fish | 9,964,897 | 8,514,701 | 6,360,212 | 5,169,423 | 5,726,970 | 6,336,844 |
| Total | 71,817,205 | 56,560,040 | 38,566,891 | 28,095,417 | 31,283,394 | 39,384,344 |

| Species | Month ended the 15th of— | | | | | |
|---|---|---|---|---|---|---|
| | July | August | September | October | November | December |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Bluefish (all trade sizes) | 78,718 | 303,419 | 788,439 | 1,124,417 | 1,136,460 | 1,017,132 |
| Butterfish (all trade sizes) | 708,736 | 988,247 | 1,161,764 | 1,255,883 | 1,655,114 | 1,607,098 |
| Catfish | 273,718 | 298,697 | 336,209 | 398,419 | 482,594 | 498,493 |
| Cisco (Lake Erie) | 25,514 | 81,791 | 185,157 | 297,683 | 211,412 | 291,221 |
| Cisco (lake herring), including bluefin, blackfin, and chub | 608,709 | 650,558 | 705,562 | 881,118 | 1,389,160 | 1,921,049 |
| Cisco (tullibees, Canadian lakes) | 616,432 | 666,183 | 596,826 | 462,268 | 462,939 | 511,840 |
| Cod, haddock, hake, pollock | 952,208 | 1,313,692 | 1,248,284 | 1,342,961 | 1,311,660 | 1,380,124 |
| Croaker | 894,146 | 1,221,064 | 1,371,934 | 1,304,078 | 1,206,702 | 1,057,562 |
| Flounders | 465,614 | 447,398 | 454,763 | 498,092 | 539,280 | 501,249 |
| Haddock fillets | 5,463,072 | 6,337,573 | 6,424,296 | 6,179,916 | 5,265,232 | 5,583,849 |
| Halibut (all trade sizes) | 8,499,702 | 10,866,432 | 11,974,153 | 11,817,147 | 10,156,830 | 7,993,672 |
| Herring sea (including alewives and bluebacks) | 1,245,567 | 1,240,802 | 1,456,337 | 2,001,653 | 2,781,550 | 2,980,793 |
| Lake trout | 631,035 | 630,132 | 629,690 | 697,027 | 1,260,563 | 1,282,097 |
| Mackerel (except Spanish) | 3,648,846 | 5,290,973 | 10,528,130 | 11,470,169 | 10,560,441 | 9,790,145 |
| Pike, blue and sauger | 507,284 | 283,739 | 149,927 | 226,268 | 391,370 | 747,865 |
| Pike, yellow or wall-eyed | 292,100 | 262,136 | 246,964 | 342,124 | 380,546 | 349,601 |
| Pike (including pickerel, jacks, and yellow jack) | 346,125 | 351,235 | 311,554 | 344,779 | 484,522 | 534,210 |
| Sablefish (black cod) | 615,724 | 637,550 | 803,506 | 1,042,544 | 1,334,908 | 1,294,809 |
| Salmon, chinook | 804,128 | 1,116,958 | 1,199,827 | 1,129,410 | 1,025,342 | 870,019 |
| Salmon, silver | 387,460 | 1,234,827 | 2,688,686 | 3,956,130 | 4,318,263 | 3,564,743 |
| Salmon, fall and pink | 464,216 | 813,119 | 904,334 | 736,212 | 1,728,769 | 1,449,004 |
| Salmon, steelhead trout | 531,865 | 1,115,299 | 1,265,955 | 1,323,483 | 1,176,501 | 1,008,853 |
| Salmon, all other | 1,087,461 | 1,542,677 | 1,811,472 | 1,932,868 | 2,005,764 | 1,744,713 |
| Scup (porgies) | 228,067 | 264,900 | 328,249 | 359,272 | 368,025 | 291,122 |
| Shad and shad roe | 430,255 | 483,721 | 484,539 | 536,944 | 583,123 | 547,094 |
| Shellfish | 1,450,752 | 1,215,002 | 1,231,421 | 1,395,085 | 2,228,854 | 2,753,972 |
| Smelts, eulachon, etc | 408,975 | 397,740 | 390,354 | 415,547 | 402,581 | 671,572 |
| Squid | 1,608,563 | 1,520,308 | 1,360,238 | 1,244,559 | 1,196,147 | 1,037,326 |
| Sturgeon and spoonbill cat | 652,057 | 676,894 | 1,012,564 | 851,521 | 490,315 | 322,373 |
| Suckers | 70,062 | 54,143 | 30,844 | 39,783 | 48,737 | 44,527 |
| Weakfish (including southern "sea trout") | 400,110 | 676,957 | 1,142,356 | 1,536,698 | 1,869,978 | 1,502,712 |
| Whitefish | 816,142 | 930,607 | 979,733 | 966,335 | 1,068,433 | 1,298,401 |
| Whiting | 6,384,450 | 6,579,190 | 6,176,934 | 6,288,959 | 6,085,647 | 5,599,689 |
| Miscellaneous fish | 6,846,633 | 7,023,572 | 7,701,521 | 8,742,733 | 9,117,227 | 10,233,469 |
| Total | 48,445,446 | 57,517,535 | 68,082,522 | 73,144,085 | 74,724,989 | 72,362,398 |

*Monthly holdings of frozen fishery products, 1931, by geographical sections* [1]

[Expressed in thousands of pounds; that is 000 omitted]

| Month ended the 15th of— | New England | Middle Atlantic | South Atlantic | North Central, East | North Central, West | South Central | Pacific [2] | Total |
|---|---|---|---|---|---|---|---|---|
| January | 18,797 | 16,511 | 4,072 | 10,734 | 4,514 | 1,074 | 16,115 | 71,817 |
| February | 14,794 | 13,612 | 3,015 | 9,303 | 4,613 | 941 | 10,282 | 56,560 |
| March | 10,334 | 9,606 | 1,550 | 6,513 | 3,777 | 725 | 6,062 | 38,567 |
| April | 7,374 | 6,183 | 536 | 4,892 | 3,458 | 689 | 4,963 | 28,095 |
| May | 7,511 | 6,736 | 915 | 5,083 | 3,314 | 700 | 7,024 | 31,283 |
| June | 10,855 | 8,894 | 1,142 | 5,309 | 3,307 | 714 | 9,163 | 39,384 |
| July | 15,189 | 9,568 | 1,630 | 5,409 | 3,432 | 886 | 12,331 | 48,445 |
| August | 17,615 | 10,983 | 2,338 | 5,365 | 3,317 | 778 | 17,121 | 57,517 |
| September | 23,286 | 12,838 | 2,752 | 5,023 | 3,184 | 743 | 20,257 | 68,083 |
| October | 24,740 | 14,274 | 2,926 | 5,825 | 3,231 | 715 | 21,434 | 73,145 |
| November | 23,207 | 15,790 | 3,335 | 6,855 | 3,839 | 858 | 20,841 | 74,725 |
| December | 21,543 | 16,705 | 3,917 | 8,692 | 3,921 | 959 | 16,625 | 72,362 |
| Average | 16,271 | 11,808 | 2,344 | 6,584 | 3,659 | 815 | 13,518 | 54,999 |

[1] New England includes the 6 States of that section; Middle Atlantic—New York, New Jersey, and Pennsylvania; South Atlantic—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; North Central, East—Ohio, Indiana, Illinois, Michigan, and Wisconsin; North Central, West—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; South Central—Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma, and Arkansas; Pacific—Washington, Oregon, California, and Alaska.

[2] Includes a very small amount of fish held in Colorado in the Mountain section.

## COLD-STORAGE HOLDINGS OF CURED FISH

Only cured herring and mild-cured salmon are reported held in cold-storage warehouses in the United States and Alaska. Other species are also held in cold storage, but no report is made on them to the Government as their volume reaches but small proportions. During 1931 the monthly holdings of cured herring varied between 11,093,000 pounds in July and 17,070,000 pounds in October. Monthly holdings of mild-cured salmon varied between 2,131,000 pounds in April and 6,952,000 pounds in October. The average monthly holdings of cured fish held in cold storage in 1931 were 12 per cent less than the average monthly holdings during the year 1930, and 24 per cent less than the 5-year average of monthly holdings. The respective monthly holdings in 1931 compared with the respective monthly holdings in 1930 show decreases of from 8 to 24 per cent with the exception of December, which shows an increase of less than one-half of 1 per cent. Compared with the respective normal monthly holdings there were decreases of from 15 to 35 per cent.

*Holdings of cured fish, 1931, by species and months*

| Month ended the 15th of— | Cured herring | Mild-cured salmon | Total |
|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* |
| January | 13,725,701 | 4,566,769 | 18,292,470 |
| February | 12,920,892 | 3,818,845 | 16,739,737 |
| March | 11,763,133 | 2,810,112 | 14,573,245 |
| April | 11,379,111 | 2,130,664 | 13,509,775 |
| May | 12,295,824 | 2,277,581 | 14,573,405 |
| June | 12,020,472 | 3,494,996 | 15,515,468 |
| July | 11,093,454 | 4,083,623 | 15,177,077 |
| August | 13,020,236 | 6,333,197 | 19,353,433 |
| September | 15,387,573 | 6,926,350 | 22,313,923 |
| October | 17,070,455 | 6,951,711 | 24,022,166 |
| November | 15,660,290 | 6,470,950 | 22,131,240 |
| December | 15,525,499 | 5,732,539 | 21,258,038 |

## FOREIGN FISHERY TRADE

Foreign trade in fishery products in the United States in 1931 amounted to $54,607,646 of which $43,033,389 represents the value of these products imported for consumption, and $11,574,257 the value of exports of domestic fishery products. Compared with the previous year, there is a decrease of 20 per cent in the total trade, 15 per cent in the value of imports, and 33 per cent in the value of exports.

Imports consisted of 276,646,946 pounds of edible products, valued at $28,936,684 and nonedible products, valued at $14,096,705. Fishery exports consisted of 114,334,877 pounds of edible products, valued at $11,380,015 and nonedible products valued at $194,242.

*Exports of domestic fishery products, 1931*

| Item | | Quantity | Value |
|---|---|---|---|
| Edible fishery products: | | | |
| Fish, fresh, frozen, or packed in ice— | | | |
| Salmon | pounds | 3,989,224 | $533,696 |
| Other fresh fish | do | 5,074,591 | 421,370 |
| Total | do | 9,063,815 | 955,066 |
| Fish, salted or dry cured— | | | |
| Cod | do | 1,021,290 | 109,491 |
| Haddock, hake, and pollock | do | 1,045,890 | 62,274 |
| Herring | do | 1,251,926 | 70,943 |
| Salmon | do | 3,636,426 | 375,129 |
| Other | do | 788,195 | 73,193 |
| Total | do | 7,743,727 | 691,030 |
| Fish, pickled— | | | |
| Salmon | do | 943,600 | 197,866 |
| Other | do | 2,747,600 | 84,593 |
| Total | do | 3,691,200 | 282,459 |
| Fish, canned— | | | |
| Salmon | do | 24,221,633 | 4,039,993 |
| Sardines | do | 53,246,898 | 3,445,770 |
| Mackerel | do | 1,550,161 | 111,218 |
| Other | do | 782,628 | 118,673 |
| Total | do | 79,801,320 | 7,715,654 |
| Shellfish— | | | |
| Canned | do | 3,126,378 | 565,340 |
| Not canned | do | 9,035,467 | 1,033,689 |
| Total | do | 12,161,845 | 1,599,029 |
| Other fish products | do | 1,872,970 | 136,777 |
| Total edible products | do | 114,334,877 | 11,380,015 |
| Nonedible fishery products: | | | |
| Marine-animal oils | do | 1,597,895 | 81,547 |
| Buttons, pearl or shell | gross | 95,683 | 27,306 |
| Sponges | pounds | 68,036 | 85,389 |
| Total | | | 112,695 |
| Total nonedible products | | | 194,242 |
| Grand total | | | 11,574,257 |

*Imports of fishery products entered for consumption, 1931*

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS | | |
| Fish, fresh or frozen: | | |
| Whole, beheaded, or eviscerated or both— | | |
| Salmon | 5,601,687 | $587,420 |
| Fresh-water fish, not elsewhere specified: | | |
| Yellow pike | 7,462,927 | 746,590 |
| Whitefish | 8,176,536 | 823,854 |
| Tullibees | 2,396,508 | 147,321 |
| Jacks or grass pike | 2,408,473 | 104,896 |
| Lake trout | 2,310,192 | 236,239 |
| Yellow perch | 726,684 | 44,861 |
| Lake herring, ciscoes and chubs | 2,319,104 | 265,972 |
| Fresh-water fish, not specially provided for | 17,514,434 | 1,173,542 |
| Eels | 356,693 | 26,746 |
| Cod, haddock, hake, pollock, and cusk | 1,236,518 | 63,373 |
| Halibut: | | |
| Fresh | 3,844,247 | 404,816 |
| Frozen | 254,011 | 35,564 |
| Mackerel | 1,825,846 | 90,421 |
| Swordfish | 2,127,889 | 207,417 |
| Sturgeon | 3,434,942 | 740,540 |
| Fish, not specially provided for | 2,561,405 | 205,819 |
| Whether or not whole— | | |
| Smelts | 6,640,047 | 840,349 |
| Tuna fish | 7,857,846 | 578,615 |
| Sea herring— | | |
| Fresh | 13,238,367 | 52,518 |
| Frozen | 2,918,543 | 91,451 |
| Fillets, skinned, boned, sliced, or divided, not specially provided for | 3,008,143 | 326,578 |
| Total | 98,221,042 | 7,794,902 |
| Fish, salted, dried, smoked, pickled or preserved: | | |
| Dried and unsalted— | | |
| Cod, haddock, hake, pollock, and cusk | 2,400,218 | 229,711 |
| Other | 1,800,895 | 286,932 |
| In oil or in oil and other substances— | | |
| Sardines | 29,417,669 | 3,931,024 |
| Anchovies | 1,888,220 | 560,410 |
| Antipasto | 365,185 | 107,381 |
| Other | 1,648,765 | 293,751 |
| Not in oil or in oil and other substances— | | |
| In air-tight containers weighing with contents, not over 15 pounds each— | | |
| Anchovies | 2,929,333 | 269,134 |
| Salmon | 137,350 | 12,653 |
| Herring and sardines | 4,902,191 | 426,971 |
| Fish cakes, balls, and pudding | 911,219 | 70,715 |
| Other | 1,467,195 | 187,140 |
| Pickled or salted— | | |
| Not in oil, etc., and not in air-tight containers weighing, with contents, 15 pounds or less each: | | |
| Salmon | 640,593 | 66,356 |
| Cod, haddock, hake, pollock, and cusk, neither skinned nor boned (except that vertibral column may be removed)— | | |
| Containing not more than 43 per cent moisture by weight | 23,350,117 | 1,367,042 |
| Containing more than 43 per cent moisture by weight | 13,467,714 | 600,450 |
| Cod, haddock, hake, pollock, and cusk, skinned or boned | 2,128,359 | 197,579 |
| Herring— | | |
| In bulk or in containers weighing, with contents, more than 15 pounds each (net weight) | 41,562,791 | 2,573,487 |
| In containers (not air-tight), weighing, with contents, not more than 15 pounds each | 32,552 | 2,252 |
| Mackerel— | | |
| In bulk or in containers weighing, with contents, more than 15 pounds each (net weight) | 6,726,970 | 312,742 |
| In containers (not air-tight) weighing, with contents, not more than 15 pounds each | 245 | 88 |
| Pickled or salted, not specially provided for— | | |
| In bulk or in containers weighing, with contents, more than 15 pounds each (net weight) | 1,909,065 | 158,463 |
| In containers (not air-tight) weighing, with contents, not more than 15 pounds each | 42,259 | 4,976 |
| Smoked or kippered— | | |
| Not in oil, etc., and not in air-tight containers weighing, with contents, 15 pounds or less each— | | |
| Salmon | 4,278 | 1,622 |
| Herring— | | |
| Whole or beheaded | 1,189,092 | 59,350 |
| Eviscerated, split, skinned, boned, or divided | 865,919 | 81,483 |
| Cod, haddock, hake, pollock, and cusk— | | |
| Whole, or beheaded, or eviscerated or both | 850,506 | 78,208 |
| Filleted, skinned, boned, sliced, or divided | 836,008 | 96,140 |
| Smoked or kippered, not specially provided for | 143,814 | 14,097 |

*Imports of fishery products entered for consumption, 1931*—Continued

| Item | Pounds | Value |
|---|---|---|
| EDIBLE FISHERY PRODUCTS—continued | | |
| Fish, salted, dried, smoked, pickled or preserved—Continued. | | |
| Fish paste and fish sauce | 67,288 | $21,978 |
| Prepared or preserved, not specially provided for— | | |
| In containers weighing, with contents, not more than 15 pounds each | 378,642 | 49,703 |
| In bulk or in containers weighing, with contents, more than 15 pounds each (net weight) | 80,437 | 9,538 |
| Total | 142,144,889 | 12,071,376 |
| Caviar and other fish roe: | | |
| Not boiled, etc.— | | |
| Sturgeon | 352,255 | 456,019 |
| Fish roe, not specially provided for | 91,313 | 18,124 |
| Boiled, packed in air-tight containers | 81,073 | 9,172 |
| Total | 524,641 | 483,315 |
| Shellfish: | | |
| Crab meat, crab sauce, and crab paste | 11,426,096 | 4,430,721 |
| Clams, clam juice, or either in combination with other substances, in air-tight containers | 1,056,296 | 154,088 |
| Oysters, oyster juice, or either in combination with other substances, in air-tight containers | 124,617 | 24,130 |
| Lobsters (including spiny lobsters and crawfish)— | | |
| Not canned | 9,983,824 | 2,171,337 |
| Canned | 1,702,721 | 820,144 |
| Clams not in air-tight containers | 3,144,295 | 64,699 |
| Shrimp and prawn | 1,077,704 | 151,509 |
| Scallops | 153,427 | 24,382 |
| Oysters, not in air-tight containers | 2,269,509 | 133,203 |
| Shellfish, not specially provided for | 4,140,719 | 509,360 |
| Pastes and sauces of shellfish, not specially provided for | 126,226 | 9,522 |
| Crabs | 35,906 | 2,692 |
| Turtles | 515,034 | 31,304 |
| Total | 35,756,374 | 8,587,091 |
| Total edible fishery products | 276,646,946 | 28,936,684 |
| NONEDIBLE FISHERY PRODUCTS | | |
| Marine-animal oils: | *Quantity* | |
| Cod oil ... gallons | 1,794,359 | 610,126 |
| Cod-liver oil ... do | 1,737,207 | 1,311,831 |
| Eulachon oil ... do | 1,375 | 688 |
| Herring oil ... do | 4,243,420 | 1,219,419 |
| Menhaden and sod oil ... do | 91,563 | 23,888 |
| Seal oil ... do | 79,870 | 24,741 |
| Whale oil— | | |
| Sperm, crude ... do | 327,115 | 110,010 |
| Sperm, refined or otherwise processed ... do | 46,107 | 17,466 |
| Whale oil, not specially provided for ... do | 10,826,250 | 4,815,690 |
| Total | 19,147,266 | 8,133,859 |
| Pearls and imitation pearls: | | |
| Pearls and parts, not strung or set | | 1,281,019 |
| Imitation pearls— | | |
| Half pearls and hollow or filled | | 17,114 |
| Solid pearls, not elsewhere specified: | | |
| Valued at not more than one-fourth cent an inch ... inches | 1,661,234 | 1,891 |
| Valued at more than one-fourth cent and not more than 1 cent an inch ... inches | 246,470 | 1,534 |
| Iridescent solid pearls: | | |
| Valued at not more than 10 cents per inch ... do | 41,102 | 226 |
| Valued at more than 10 cents per inch ... do | 90 | 12 |
| Total | | 1,301,796 |
| Shells and buttons of pearl or shell: | | |
| Shells, unmanufactured— | | |
| Green snail shell ... pounds | 114,521 | 13,620 |
| Mother-of-pearl ... do | 4,438,168 | 1,298,015 |
| Shells, not specially provided for ... do | 2,719,310 | 71,234 |
| Shells and mother-of-pearl, engraved, cut, ornamented, or manufactured | | 22,205 |
| Shell pearl buttons— | | |
| Ocean or trochus ... gross | 131,543 | 56,105 |
| Buttons (from Philippine Islands) ... do | 849,009 | 384,743 |
| Total | | 1,846,522 |

*Imports of fishery products entered for consumption, 1931*—Continued

| Item | Quantity | Value |
|---|---|---|
| NONEDIBLE FISHERY PRODUCTS—continued | | |
| Sponges: | | |
| Sheepswool ..... pounds | 208,539 | $425,384 |
| Yellow, grass, or velvet ..... do | 324,728 | 154,875 |
| Other ..... do | 38,904 | 83,263 |
| Manufactures of ..... do | 2,557 | 1,071 |
| Total | 574,728 | 664,593 |
| Agar-agar ..... pounds | 469,335 | 304,466 |
| Ambergris ..... do | 7 | 1,940 |
| Cod-liver oil cake and cod-liver oil cake meal ..... do | 944,856 | 30,195 |
| Cuttlefish bone ..... do | 432,970 | 57,361 |
| Goldfish, live ..... number | 1,518,641 | 20,306 |
| Fish for other than human consumption | | 56,698 |
| Fish sounds ..... pounds | 97,766 | 17,509 |
| Fish scrap and fish meal ..... tons | 38,447 | 1,351,842 |
| Skins, fish, raw or salted ..... pounds | 131,904 | 13,453 |
| Skins, seal, raw (not fur skins) ..... do | 2,208,166 | 292,813 |
| Spermaceti wax ..... do | 24,261 | 2,767 |
| Whalebone, unmanufactured ..... do | 14 | 31 |
| Whalebone, manufactures of | | 554 |
| Total | | 2,149,935 |
| Total nonedible fishery products | | 14,096,705 |
| Grand total | | 43,033,389 |

## FISHERIES OF THE NEW ENGLAND STATES [4]

The yield of fishery products in the New England States during 1930 amounted to 701,350,979 pounds, valued at $27,493,479. This is an increase of 1 per cent in the volume of the catch, but a decrease of 5 per cent in its value as compared with the catch in the previous year. Of the total catch in 1930, 645,574,206 pounds, valued at $19,232,205 were fish, and 55,776,773 pounds, valued at $8,261,274 were shellfish and miscellaneous products. These fisheries gave employment to 17,077 fishermen which is a decrease of less than one-half of 1 per cent as compared with the number of fishermen in 1929. Of the total number of fishermen employed during 1930, 6,192 regular fishermen were engaged on vessels and 7,961 regular and 2,924 casual fishermen were employed in the boat and shore fisheries.

*Fisheries of the New England States, 1930*

SUMMARY OF CATCH

| Product | Maine | | New Hampshire | | Massachusetts | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 124,465,169 | $1,828,711 | 888,490 | $28,781 | 427,521,214 | $14,030,256 |
| Shellfish, etc | 19,358,465 | 2,500,695 | 180,587 | 40,363 | 14,952,751 | 2,258,822 |
| Total | 143,823,634 | 4,329,406 | 1,069,077 | 69,144 | 442,473,965 | 16,289,078 |

| Product | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 16,935,860 | $699,748 | 75,763,473 | $2,644,709 | 645,574,206 | $19,232,205 |
| Shellfish, etc | 9,036,033 | 1,587,522 | 12,248,937 | 1,873,872 | 55,776,773 | 8,261,274 |
| Total | 25,971,893 | 2,287,270 | 88,012,410 | 4,518,581 | 701,350,979 | 27,493,479 |

[4] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure" which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

*Fisheries of the New England States, 1930*—Continued

OPERATING UNITS: BY STATES

| Item | Maine | New Hampshire | Massachusetts | Rhode Island | Connecticut | Total |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 439 | | 4,445 | 356 | 952 | 6,192 |
| On boats and shore— | | | | | | |
| Regular | 3,760 | 46 | 2,859 | 870 | 426 | 7,961 |
| Casual | 952 | 40 | 1,377 | 403 | 152 | 2,924 |
| Total | 5,151 | 86 | 8,681 | 1,629 | 1,530 | 17,077 |
| Vessels: | | | | | | |
| Steam | | | 22 | 9 | 33 | 64 |
| Net tonnage | | | 3,291 | 265 | 5,477 | 9,033 |
| Motor | 78 | | 395 | 74 | 102 | 649 |
| Net tonnage | 962 | | 15,384 | 747 | 1,490 | 18,583 |
| Sail | 1 | | 1 | | 3 | 5 |
| Net tonnage | 19 | | 6 | | 25 | 50 |
| Total vessels | 79 | | 418 | 83 | 138 | 718 |
| Total net tonnage | 981 | | 18,681 | 1,012 | 6,992 | 27,666 |
| Boats: | | | | | | |
| Motor | 2,166 | 38 | 1,669 | 578 | 237 | 4,688 |
| Other | 1,726 | 5 | 1,477 | 673 | 218 | 4,099 |
| Accessory boats | 189 | | 979 | 160 | 62 | 1,373 |
| Apparatus: | | | | | | |
| Purse seines— | | | | | | |
| Mackerel | 31 | 2 | 105 | 4 | 9 | 151 |
| Length, yards | 7,994 | 500 | 50,098 | 560 | 1,620 | 60,772 |
| Menhaden | | | | | 2 | 2 |
| Length, yards | | | | | 720 | 720 |
| Other | 28 | | 3 | 1 | | 32 |
| Length, yards | 6,724 | | 410 | 320 | | 7,454 |
| Haul seines | 78 | 1 | 13 | 27 | 28 | 147 |
| Length, yards | 10,026 | 100 | 2,225 | 3,100 | 2,710 | 18,161 |
| Gill nets— | | | | | | |
| Anchor | 1,415 | | 2,034 | | 32 | 3,481 |
| Square yards | 209,750 | | 653,340 | | 5,370 | 868,460 |
| Drift | 74 | | 9,461 | 161 | 230 | 9,926 |
| Square yards | 11,681 | | 3,286,236 | 59,640 | 22,770 | 3,380,327 |
| Runaround | | | | 12 | | 12 |
| Square yards | | | | 24,100 | | 24,100 |
| Stake | 105 | | | | | 105 |
| Square yards | 4,725 | | | | | 4,725 |
| Lines— | | | | | | |
| Hand | 4,375 | 160 | 583 | 432 | 288 | 5,838 |
| Hooks | 4,403 | 160 | 849 | 587 | 297 | 6,296 |
| Trawl | 33,050 | 3,600 | 54,956 | 1,193 | 1,726 | 94,525 |
| Hooks | 1,629,100 | 180,000 | 2,730,464 | 56,550 | 84,380 | 4,680,494 |
| Pound nets | | | 136 | 62 | 11 | 209 |
| Floating traps | 25 | | 19 | 62 | 8 | 114 |
| Weirs | 213 | | 6 | | | 219 |
| Fyke nets | 59 | | 52 | 40 | 107 | 258 |
| Dip nets | 104 | | 61 | 17 | | 182 |
| Bag nets | 165 | | | | | 165 |
| Push nets | | | 53 | | | 53 |
| Pocket nets | 17 | | | | | 17 |
| Otter trawls | 36 | | 331 | 66 | 132 | 565 |
| Yards at mouth | 1,117 | | 9,750 | 1,824 | 3,274 | 15,965 |
| Box traps | 10 | | 1 | 4 | | 15 |
| Pots— | | | | | | |
| Crab | 1,635 | | 1,735 | | 160 | 3,530 |
| Eel | 440 | | 1,782 | 2,015 | 808 | 5,045 |
| Lobster | 205,302 | 2,570 | 69,249 | 39,165 | 16,505 | 332,791 |
| Periwinkle and cockle | | | 1,012 | 875 | | 1,887 |
| Harpoons, swordfish | 44 | 2 | 107 | 49 | 19 | 221 |
| Spears | 41 | | 201 | 37 | 40 | 319 |
| Dredges— | | | | | | |
| Oyster | | | 26 | 32 | 242 | 300 |
| Yards at mouth | | | 27 | 49 | 241 | 317 |
| Scallop | 113 | | 2,877 | 532 | | 3,522 |
| Yards at mouth | 157 | | 2,337 | 414 | | 2,908 |
| Clam | | | 78 | 6 | | 84 |
| Yards at mouth | | | 40 | 4 | | 44 |
| Tongs | | | 183 | 523 | 144 | 850 |
| Rakes | | | 552 | 156 | 30 | 738 |
| Forks | 1,598 | | 538 | 13 | 64 | 2,213 |
| Hoes | 16 | | 610 | 10 | 6 | 642 |

*Fisheries of the New England States, 1930*—Continued

CATCH: BY STATES

| Species | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | | | | | |
| Albacore | | | | | | | 34,759 | $703 | | | 34,759 | $703 |
| Alewives | 2,129,495 | $17,369 | | | 1,789,846 | $17,630 | 186,050 | 1,693 | 1,000 | $30 | 4,106,391 | 36,722 |
| Bluefish | 200 | 19 | | | 210,307 | 20,752 | 243,295 | 29,516 | 251,651 | 32,670 | 705,453 | 82,957 |
| Bonito | | | | | 82,417 | 6,519 | 57,439 | 4,221 | 116 | 13 | 139,972 | 10,753 |
| Butterfish | 112,140 | 14,891 | | | 855,113 | 72,167 | 901,120 | 48,717 | 36,179 | 3,773 | 1,904,552 | 139,548 |
| Carp | | | | | 2,976 | 59 | | | 17,995 | 1,946 | 20,971 | 2,005 |
| Catfish and bullheads | 15,425 | 158 | | | 102,125 | 2,382 | | | | | 117,550 | 2,540 |
| Cod | 13,483,964 | 356,731 | 157,800 | $3,945 | 77,522,224 | 2,358,348 | 1,552,952 | 64,819 | 8,915,229 | 259,169 | 101,632,169 | 3,043,012 |
| Croaker | | | | | 140,005 | 5,600 | | | 10,780 | 434 | 150,785 | 6,034 |
| Cunners | | | | | 18,735 | 574 | 87,600 | 2,496 | | | 106,335 | 3,070 |
| Cusk | 1,353,983 | 28,555 | 7,890 | 117 | 4,713,076 | 103,549 | | | 65,241 | 960 | 6,140,190 | 133,181 |
| Dolphin | | | | | | | | | 138 | 8 | 138 | 8 |
| Eels | 241,975 | 22,213 | | | 479,065 | 44,466 | 495,152 | 47,234 | 138,729 | 18,007 | 1,354,921 | 131,920 |
| Flounders | 1,949,966 | 88,889 | 15,780 | 473 | 31,334,909 | 1,262,638 | 4,700,571 | 146,972 | 11,164,206 | 364,478 | 49,165,432 | 1,863,450 |
| Frigate mackerel | | | | | 384,661 | 17,921 | | | | | 384,661 | 17,921 |
| Goosefish | | | | | 200 | 3 | | | | | 200 | 3 |
| Grayfish | | | | | 84,296 | 2,882 | 8,900 | 167 | | | 93,196 | 3,049 |
| Haddock | 12,508,138 | 371,773 | 394,000 | 15,780 | 202,687,789 | 6,441,249 | 886,328 | 30,121 | 48,072,674 | 1,672,619 | 264,548,929 | 8,531,542 |
| Hake | 11,685,397 | 116,335 | 78,900 | 1,174 | 19,240,569 | 412,058 | 62,860 | 1,724 | 1,137,702 | 25,212 | 32,205,428 | 556,503 |
| Halibut | 103,344 | 17,708 | 300 | 45 | 2,880,444 | 445,638 | | | 182,910 | 33,472 | 3,166,998 | 496,863 |
| Herring, sea | 73,938,780 | 385,712 | 60,000 | 450 | 8,687,049 | 113,467 | 214,711 | 3,067 | | | 82,900,540 | 502,696 |
| Hickory shad | | | | | | | 4,049 | 85 | | | 4,049 | 85 |
| King whiting or "kingfish" | | | | | 200 | 21 | | | | | 200 | 21 |
| Launce | | | | | 182,926 | 4,384 | | | | | 182,926 | 4,384 |
| Mackerel | 3,042,157 | 118,038 | 100,000 | 4,000 | 45,531,276 | 1,569,658 | 1,411,571 | 51,656 | 615,626 | 24,366 | 50,700,630 | 1,767,718 |
| Menhaden | | | | | | | 132,160 | 1,039 | 1,575,660 | 15,862 | 1,707,820 | 16,901 |
| Minnows | | | | | 6,000 | 1,200 | | | 30,035 | 2,722 | 36,035 | 3,922 |
| Mullet | | | | | | | 8,392 | 298 | | | 8,392 | 298 |
| Mummichog | | | | | | | | | 7,134 | 713 | 7,134 | 713 |
| Pike or pickerel | | | | | | | | | 275 | 41 | 275 | 41 |
| Pollock | 2,045,142 | 28,616 | 39,450 | 562 | 15,014,676 | 261,472 | 174,926 | 2,495 | 545,366 | 12,519 | 17,819,560 | 305,664 |
| Rosefish | 3,845 | 34 | | | 109,857 | 2,189 | | | 3,528 | 25 | 117,230 | 2,248 |
| Salmon | 88,295 | 27,265 | | | 55 | 10 | | | | | 88,350 | 27,275 |
| Scup or porgy | | | | | 792,008 | 35,798 | 1,645,590 | 76,273 | 285,452 | 5,697 | 2,723,050 | 117,768 |
| Sea bass | | | | | 141,587 | 9,377 | 35,734 | 2,161 | 14,253 | 2,103 | 191,574 | 13,641 |
| Sea robin | | | | | 100 | 1 | 193,928 | 2,360 | 41,056 | 207 | 235,084 | 2,568 |
| Shad | 88,635 | 1,801 | | | 54,149 | 2,941 | 4,303 | 701 | 53,942 | 10,095 | 201,029 | 15,538 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sharks | 41,010 | 1,039 | | | 49,069 | 976 | 12,980 | 216 | | | 103,059 | 2,231 |
| Skates | | | | | 51,803 | 816 | 680,350 | 6,517 | 283,833 | 2,352 | 1,015,986 | 9,685 |
| Skipper or "billfish" | | | | | | | 6,068 | 1,248 | | | 6,068 | 1,248 |
| Smelt | 720,708 | 126,399 | 8,000 | 1,600 | 6,250 | 2,719 | 50,975 | 7,680 | 9,900 | 2,123 | 795,833 | 140,521 |
| Spearfish | 94 | 11 | | | | | | | | | 94 | 11 |
| Squeteagues or "sea trout": | | | | | | | | | | | | |
| Gray | | | | | 1,238 | 149 | 141,145 | 15,416 | 43,252 | 3,822 | 185,635 | 19,387 |
| Spotted | | | | | 1,246 | 221 | | | | | 1,246 | 221 |
| Striped bass | | | | | 27,385 | 6,099 | 59,817 | 10,870 | 1,638 | 185 | 88,840 | 17,154 |
| Sturgeon | 440 | 66 | | | 7,745 | 1,015 | 1,234 | 197 | | | 9,419 | 1,278 |
| Suckers | 36,859 | 2,949 | | | | | 7,600 | 152 | 69,020 | 5,263 | 113,479 | 8,364 |
| Swordfish | 572,519 | 93,214 | | | 3,728,333 | 657,593 | 609,899 | 90,109 | 224,298 | 35,668 | 5,135,047 | 876,584 |
| Tautog | | | | | 109,710 | 6,758 | 309,635 | 15,142 | 135,545 | 10,087 | 554,890 | 31,987 |
| Tilefish | | | | | | | | | 1,783,456 | 97,068 | 1,783,456 | 97,068 |
| Tomcod | 51,252 | 897 | | | | | 22,600 | 302 | 200 | 60 | 74,052 | 1,259 |
| Tuna or "horse-mackerel" | 140,918 | 6,873 | 2,700 | 162 | 66,066 | 5,223 | 24,180 | 1,901 | 5,400 | 324 | 239,264 | 14,483 |
| White perch | | | | | 450 | 45 | 49,700 | 5,038 | | | 50,150 | 5,083 |
| Whiting | 40,630 | 228 | | | 7,902,288 | 81,719 | 1,917,287 | 26,442 | 2,500 | 10 | 9,862,705 | 108,399 |
| Wolffish | 69,470 | 883 | 23,670 | 473 | 2,520,991 | 51,970 | | | 36,856 | 501 | 2,650,987 | 53,827 |
| Yellow perch | 388 | 45 | | | | | | | 700 | 105 | 1,088 | 150 |
| Total | 124,465,169 | 1,828,711 | 888,490 | 28,781 | 427,521,214 | 14,030,256 | 16,935,860 | 699,748 | 75,763,473 | 2,644,709 | 645,574,206 | 19,232,205 |
| SHELLFISH, ETC. | | | | | | | | | | | | |
| Crabs, hard | 1,123,353 | 33,780 | | | 458,298 | 86,280 | 166,562 | 5,256 | 203,528 | 4,056 | 1,951,741 | 129,372 |
| Lobsters | 7,750,682 | 2,007,343 | 180,587 | 40,363 | 2,338,234 | 625,946 | 1,353,107 | 313,550 | 734,712 | 230,266 | 12,357,322 | 3,217,468 |
| Shrimp | | | | | 4,800 | 3,600 | | | | | 4,800 | 3,600 |
| Squid | 119,140 | 1,185 | | | 3,830,006 | 68,922 | 1,545,902 | 41,876 | 10,700 | 225 | 5,505,748 | 112,208 |
| Clams: | | | | | | | | | | | | |
| Cockle | 4,206 | 210 | | | 24,570 | 4,715 | | | | | 28,776 | 4,925 |
| Hard, public [1] | | | | | 1,889,704 | 477,010 | 1,626,427 | 317,874 | 17,428 | 8,584 | 3,533,559 | 803,468 |
| Hard, private [1] | | | | | 66,000 | 7,149 | 222,448 | 47,505 | | | 288,448 | 54,654 |
| Razor | | | | | 380,266 | 20,476 | | | | | 380,266 | 20,476 |
| Soft, public [2] | 9,648,588 | 341,612 | | | 3,273,652 | 275,934 | 28,440 | 6,442 | 71,730 | 12,989 | 13,022,410 | 636,977 |
| Soft, private [2] | 276,080 | 7,364 | | | | | | | | | 276,080 | 7,364 |
| Surf or skimmer | | | | | 38,275 | 3,750 | | | | | 38,275 | 3,750 |
| Mussels, sea | | | | | 10,800 | 2,100 | | | | | 10,800 | 2,100 |
| Oysters: | | | | | | | | | | | | |
| Market, public, spring [3] | | | | | 770 | 200 | 8,944 | 2,650 | 5,135 | 1,745 | 14,849 | 4,595 |
| Market, public, fall [3] | | | | | | | 9,079 | 2,670 | 21,741 | 3,825 | 30,820 | 6,495 |
| Market, private, spring [3] | | | | | 222,175 | 100,411 | 1,531,592 | 339,887 | 3,032,230 | 423,439 | 4,785,997 | 863,737 |
| Market, private, fall [3] | | | | | 211,569 | 90,039 | 1,832,128 | 392,709 | 2,556,605 | 389,525 | 4,600,302 | 872,273 |

[1] Statistics on hard clams used in this table are based on yields of 11 pounds of meats per bushel in Massachusetts and Rhode Island, and 8 pounds in Connecticut. In reports for previous years all hard clams in these States have been computed on the basis of a uniform yield of 8 pounds of meats to the bushel.

[2] Statistics on soft clams used in this table are based on yields of 17 pounds of meats per bushel in Maine, Massachusetts, and Rhode Island; and 15 pounds in Connecticut. In reports for previous years, all soft clams in these States have been computed on the basis of a uniform yield of 10 pounds of meats to the bushel.

[3] Statistics on market oysters used in this table are based on yields of 8.8 pounds of meats per bushel in Massachusetts, 8 pounds in Rhode Island, and 7.5 pounds in Connecticut. In reports for previous years, all market oysters have been computed on the basis of a uniform yield of 7 pounds of meats to the bushel.

*Fisheries of the New England States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | Maine | | New Hampshire | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC.—continued | | | | | | | | | | | | |
| Oysters—Continued. | | | | | | | | | | | | |
| Seed, public, spring [4] | | | | | | | 6,023 | $1,002 | 518,805 | $72,405 | 524,828 | $73,407 |
| Seed, public, fall [4] | | | | | 31,500 | $2,250 | 361 | 47 | 805,406 | 92,308 | 837,267 | 94,605 |
| Seed, private, spring [4] | | | | | 115,808 | 6,886 | 298,500 | 40,750 | 3,709,741 | 556,963 | 4,124,049 | 604,599 |
| Seed, private, fall [4] | | | | | | | | | 561,176 | 77,542 | 561,176 | 77,542 |
| Periwinkles | | | | | 17,442 | 3,887 | 312,210 | 34,680 | | | 329,652 | 38,567 |
| Scallops: | | | | | | | | | | | | |
| Bay | | | | | 1,435,144 | 396,565 | 94,310 | 40,624 | | | 1,529,454 | 437,189 |
| Sea | 436,416 | $109,201 | | | 510,738 | 77,122 | | | | | 947,154 | 186,323 |
| Irish moss | | | | | 93,000 | 5,580 | | | | | 93,000 | 5,580 |
| Total | 19,358,465 | 2,500,695 | 180,587 | $40,363 | 14,952,751 | 2,258,822 | 9,036,033 | 1,587,522 | 12,248,937 | 1,873,872 | 55,776,773 | 8,261,274 |
| Grand total | 143,823,634 | 4,329,406 | 1,069,077 | 69,144 | 442,473,965 | 16,289,078 | 25,971,893 | 2,287,270 | 88,012,410 | 4,518,581 | 701,350,979 | 27,493,479 |

[4] Statistics on seed oysters, public and private, used in this table are based on yields of 7 pounds of meats to the bushel, the same as in previous reports.

*Fisheries of the New England States, 1930*—Continued

PRODUCTION OF CERTAIN SHELLFISH IN NUMBERS AND BUSHELS

| Product | Maine | | Massachusetts | | Rhode Island | | Connecticut | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| Crabs, hard..number.. | 3,370,058 | $33,780 | 1,374,894 | $86,280 | 499,686 | $5,256 | 610,584 | $4,056 | 5,855,223 | $129,372 |
| Clams: | | | | | | | | | | |
| Cockle....bushels.. | 421 | 210 | 1,365 | 4,715 | | | | | 1,786 | 4,925 |
| Hard, public.do.... | | | 17,791 | 477,010 | 147,857 | 317,874 | 2,179 | 8,584 | 321,827 | 803,468 |
| Hard, private .....do.... | | | 6,000 | 7,149 | 20,223 | 47,505 | | | 26,223 | 54,654 |
| Razor.....do.... | | | 7,042 | 20,476 | | | | | 7,042 | 20,476 |
| Soft, public..do.... | 567,564 | 341,612 | 192,568 | 275,934 | 1,673 | 6,442 | 4,782 | 12,989 | 766,587 | 636,977 |
| Soft, private..do... | 16,240 | 7,364 | | | | | | | 16,240 | 7,364 |
| Surf or skimmer .....bushels.. | | | 3,190 | 3,750 | | | | | 3,190 | 3,750 |
| Mussels.....do.... | | | 1,080 | 2,100 | | | | | 1,080 | 2,100 |
| Oysters: | | | | | | | | | | |
| Market, public, spring..bushels.. | | | 88 | 200 | 1,118 | 2,650 | 685 | 1,745 | 1,891 | 4,595 |
| Market, public, fall .....bushels.. | | | | | 1,135 | 2,670 | 2,900 | 3,825 | 4,035 | 6,495 |
| Market, private, spring..bushels.. | | | 25,247 | 100,411 | 191,449 | 339,887 | 404,459 | 423,439 | 621,155 | 863,737 |
| Market, private, fall.....bushels.. | | | 24,042 | 90,039 | 229,016 | 392,709 | 341,017 | 389,525 | 594,075 | 872,273 |
| Seed, public, spring .....bushels.. | | | | | 860 | 1,002 | 74,115 | 72,405 | 74,975 | 73,407 |
| Seed, public, fall .....bushels.. | | | 4,500 | 2,250 | 52 | 47 | 115,058 | 92,308 | 119,610 | 94,605 |
| Seed, private, spring..bushels.. | | | 16,544 | 6,886 | 42,643 | 40,750 | 529,963 | 556,963 | 589,150 | 604,599 |
| Seed, private, fall .....bushels.. | | | | | | | 80,168 | 77,542 | 80,168 | 77,542 |
| Periwinkles.....do.... | | | 969 | 3,887 | 17,345 | 34,680 | | | 18,314 | 38,567 |
| Scallops: | | | | | | | | | | |
| Bay.....do.... | | | 239,191 | 398,565 | 15,718 | 40,624 | | | 254,909 | 437,189 |
| Sea.....do.... | 72,736 | 109,201 | 85,123 | 77,122 | | | | | 157,859 | 186,323 |

*Industries related to the fisheries of the New England States, 1930*

| Item | Maine | New Hampshire | Massachusetts | Rhode Island | Connecticut | Total |
|---|---|---|---|---|---|---|
| Transporting: | | | | | | |
| Persons engaged— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 239 | 3 | 30 | 19 | 72 | 363 |
| On boats | 1 | | | | | 1 |
| Total | 240 | 3 | 30 | 19 | 72 | 364 |
| Vessels— | | | | | | |
| Steam | | | | | 3 | 3 |
| Net tonnage | | | | | 150 | 150 |
| Motor | 115 | 1 | 12 | 6 | 13 | 147 |
| Net tonnage | 1,260 | 16 | 199 | 55 | 305 | 1,835 |
| Total vessels | 115 | 1 | 12 | 6 | 16 | 150 |
| Total net tonnage | 1,260 | 16 | 199 | 55 | 455 | 1,985 |
| Boats | 1 | | | | | 1 |
| Wholesale and manufacturing— | | | | | | |
| Establishments | 187 | 3 | 193 | 34 | 33 | 450 |
| Persons engaged— | | | | | | |
| Proprietors | 214 | 5 | 77 | 28 | 40 | 364 |
| Salaried employees | 155 | | 762 | 58 | 53 | 1,028 |
| Wage earners— | | | | | | |
| Average for season | 5,888 | 9 | 2,734 | 328 | 903 | 9,862 |
| Average for year | 1,814 | 8 | 2,429 | 218 | 694 | 5,163 |
| Salaries and wages paid | $1,822,209 | $17,780 | $5,192,823 | $372,328 | $1,050,320 | $8,455,460 |
| Manufactured products [1] | $6,877,816 | (2) | $15,869,420 | $1,291,225 | $2,716,889 | $26,755,350 |
| Fishermen's manufactured products: | | | | | | |
| Persons engaged | 355 | | 3,325 | 467 | | 4,147 |
| Products | $133,956 | | $691,678 | $37,331 | | $862,965 |

[1] These production figures are not comparable with those shown in previous bulletins since packaged fresh and frozen fishery products are now included.

[2] Included with Maine.

NOTE.—Of the total number of persons employed on transporting craft, 8 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 2,950 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## MAINE

*Fisheries of Maine, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | | Lines | | Floating traps |
|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | Anchor | Drift | Stake | Hand | Trawl | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 97 | 95 | 2 | 37 | 6 | | 12 | 190 | |
| On boats and shore— | | | | | | | | | |
| Regular | 38 | 19 | 164 | 136 | 8 | | 532 | 839 | 32 |
| Casual | | | 3 | 59 | 7 | 5 | 686 | | 3 |
| Total | 135 | 114 | 169 | 232 | 21 | 5 | 1,230 | 1,029 | 35 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 9 | 16 | 1 | 5 | | | 5 | 8 | |
| 11 to 20 tons | 5 | 5 | | 2 | | | | 7 | |
| 21 to 30 tons | | 1 | | | | | | 2 | |
| 31 to 40 tons | 1 | | | | | | | 2 | |
| 41 to 50 tons | | 1 | | | | | | | |
| 51 to 60 tons | | | | | | | | 2 | |
| Total | 15 | 23 | 1 | 7 | | | 5 | 21 | |
| Net tonnage | 174 | 242 | 9 | 67 | | | 32 | 410 | |
| Sail— | | | | | | | | | |
| 10 to 20 tons | 1 | | | | 1 | | | 1 | |
| Net tonnage | 19 | | | | 19 | | | 19 | |
| Total vessels | 16 | 23 | 1 | 7 | 1 | | 5 | 22 | |
| Total net tonnage | 193 | 242 | 9 | 67 | 19 | | 32 | 429 | |
| Boats: | | | | | | | | | |
| Motor | 14 | 5 | 77 | 71 | 4 | 1 | 303 | 581 | 17 |
| Other | 14 | 6 | 79 | 59 | 4 | 5 | 157 | 162 | 3 |
| Accessory boats | 22 | 29 | 1 | | | | 1 | 138 | |
| Apparatus: | | | | | | | | | |
| Number | 31 | 28 | 78 | 1,415 | 74 | 105 | 4,375 | 33,050 | 25 |
| Length, yards | 7,994 | 6,724 | 10,026 | | | | | | |
| Square yards | | | | 209,750 | 11,681 | 4,725 | | | |
| Hooks, baits, or snoods | | | | | | | 4,403 | 1,629,100 | |

| Item | Weirs | Fyke nets | Dip nets | Bag nets | Pocket nets | Otter trawls | Box traps | Pots | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Crab | Eel | Lobster |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | | | | | | 39 | | | | 10 |
| On boats or shore— | | | | | | | | | | |
| Regular | 246 | | 6 | 33 | | 61 | | 37 | 13 | 2,138 |
| Casual | 83 | 13 | 98 | 60 | 6 | | 10 | | 11 | 2 |
| Total | 329 | 13 | 104 | 93 | 6 | 100 | 10 | 37 | 24 | 2,150 |
| Vessels: | | | | | | | | | | |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | | | | | | 7 | | | | 5 |
| 11 to 20 tons | | | | | | 3 | | | | |
| Total | | | | | | 10 | | | | 5 |
| Net tonnage | | | | | | 92 | | | | 27 |
| Boats: | | | | | | | | | | |
| Motor | 136 | 1 | | 15 | 2 | 30 | | 28 | 2 | 1,804 |
| Other | 182 | 12 | | 58 | 4 | 4 | 2 | 10 | 22 | 849 |
| Apparatus: | | | | | | | | | | |
| Number | 213 | 59 | 104 | 165 | 17 | 36 | 10 | 1,635 | 440 | 205,302 |
| Yards at mouth | | | | | | 1,117 | | | | |

*Fisheries of Maine, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Harpoons, swordfish | Spears | Dredges, scallop | Forks | Hoes | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 179 | | 21 | | | | 439 |
| On boats and shore— | | | | | | | |
| Regular | 54 | 4 | 109 | 1,605 | 16 | | 3,760 |
| Casual | | 37 | | 28 | | 1 | 952 |
| Total | 233 | 41 | 130 | 1,633 | 16 | 1 | 5,151 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | 3 | | 5 | | | | 49 |
| 11 to 20 tons | 7 | | 2 | | | | 21 |
| 21 to 30 tons | 2 | | | | | | 3 |
| 31 to 40 tons | 2 | | | | | | 2 |
| 41 to 50 tons | | | | | | | 1 |
| 51 to 60 tons | 2 | | | | | | 2 |
| Total | 16 | | 7 | | | | 78 |
| Net tonnage | 374 | | 65 | | | | 962 |
| Sail— | | | | | | | |
| 10 to 20 tons | 1 | | | | | | 1 |
| Net tonnage | 19 | | | | | | 19 |
| Total vessels | 17 | | 7 | | | | 79 |
| Total net tonnage | 393 | | 65 | | | | 981 |
| Boats: | | | | | | | |
| Motor | 27 | 1 | 94 | 224 | | | 2,166 |
| Other | | 40 | 7 | 581 | 3 | | 1,726 |
| Accessory boats | 14 | | | | | | 189 |
| Apparatus: | | | | | | | |
| Number | 44 | 41 | 113 | 1,598 | 16 | | 248,974 |
| Yards at mouth | | | 157 | | | | |

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 135,000 | $4,000 | | | | | 47,516 | $660 | | |
| Butterfish | 1,300 | 39 | | | | | | | | |
| Cod | | | | | | | 2,996,823 | 93,208 | | |
| Cusk | | | | | | | 17,890 | 354 | | |
| Flounders | | | | | | | 4,992 | 97 | | |
| Haddock | | | | | | | 910,435 | 23,931 | | |
| Hake | | | | | | | 334,677 | 6,054 | | |
| Halibut | | | | | | | 238 | 29 | | |
| Herring, sea | 6,381,032 | 62,546 | 32,602,280 | $169,471 | 2,561,391 | $13,873 | 3,065 | 61 | 25,000 | $214 |
| Mackerel | 1,900,205 | 74,198 | 150,000 | 7,200 | | | 349,900 | 14,140 | 89,462 | 3,282 |
| Pollock | 143 | 3 | 65,810 | 658 | | | 980,627 | 14,387 | | |
| Salmon | 43 | 7 | | | | | 15,152 | 4,826 | 600 | 180 |
| Shad | 54,026 | 816 | 1,500 | 30 | | | 1,720 | 121 | 29,800 | 808 |
| Sharks | | | | | | | 34,189 | 871 | | |
| Smelts | 2,500 | 375 | | | 268,770 | 44,343 | 82,797 | 15,851 | | |
| Sturgeon | | | | | | | 190 | 16 | 250 | 50 |
| Tomcod | | | | | 11,252 | 207 | | | | |
| Whiting | 12,000 | 60 | | | | | | | | |
| Wolffish | | | | | | | 67 | 1 | | |
| Lobsters | | | | | | | 36 | 15 | | |
| Total | 8,486,249 | 142,044 | 32,819,590 | 177,359 | 2,841,413 | 58,513 | 5,786,314 | 174,022 | 145,112 | 4,534 |

*Fisheries of Maine, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets—Stake | | Lines | | | | Floating traps | | Weirs | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Hand | | Trawl | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | | | 630,833 | $5,650 |
| Bluefish | | | | | | | 200 | $19 | | |
| Butterfish | | | | | | | 110,840 | 14,852 | | |
| Catfish and bullheads | | | | | 15,425 | $158 | | | | |
| Cod | | | 1,796,906 | $41,085 | 7,905,720 | 202,487 | | | | |
| Cusk | | | 16,975 | 173 | 1,312,165 | 27,957 | | | | |
| Eels | | | | | 15,640 | 1,564 | | | | |
| Flounders | | | | | 57,739 | 1,578 | | | | |
| Haddock | | | 1,250,936 | 32,705 | 9,500,613 | 294,998 | | | | |
| Hake | | | 1,250,419 | 12,061 | 9,833,249 | 95,654 | | | | |
| Halibut | | | 15,647 | 2,729 | 87,330 | 14,929 | | | | |
| Herring, sea | | | | | | | 1,474,000 | 9,766 | 30,892,012 | 129,781 |
| Mackerel | | | | | | | 546,590 | 18,918 | 6,000 | 300 |
| Pollock | | | 498,713 | 6,513 | 493,255 | 7,046 | | | | |
| Rosefish | | | | | 3,845 | 34 | | | | |
| Salmon | 9,000 | $2,700 | | | | | 8,958 | 2,381 | 50,512 | 15,760 |
| Shad | | | | | | | 1,589 | 26 | | |
| Sharks | | | | | 5,121 | 123 | 1,500 | 41 | | |
| Smelts | 7,334 | 1,100 | 207,270 | 38,392 | | | 150 | 23 | 6,124 | 1,144 |
| Whiting | | | | | | | 28,630 | 168 | | |
| Wolffish | | | | | 67,447 | 861 | | | | |
| Squid | | | | | | | 119,140 | 1,185 | | |
| Total | 16,334 | 3,800 | 5,036,866 | 133,658 | 29,297,549 | 647,389 | 2,291,597 | 47,379 | 31,585,481 | 152,635 |

| Species | Fyke nets | | Dip nets | | Bag nets | | Pocket nets | | Otter trawls | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 1,316,146 | $7,059 | | | | | | |
| Cod | | | | | | | | | 784,515 | $19,951 |
| Cusk | | | | | | | | | 6,953 | 71 |
| Eels | 1,595 | $160 | 8,640 | 864 | | | | | 8,000 | 240 |
| Flounders | | | | | | | | | 1,887,235 | 87,214 |
| Haddock | | | | | | | | | 846,154 | 20,139 |
| Hake | | | | | | | | | 267,052 | 2,566 |
| Halibut | | | | | | | | | 129 | 21 |
| Pollock | | | | | | | | | 594 | 9 |
| Salmon | | | 4,030 | 1,411 | | | | | | |
| Sharks | | | | | | | | | 200 | 4 |
| Smelts | | | 19,000 | 2,900 | 125,213 | $21,978 | 1,550 | $293 | | |
| Suckers | 36,859 | 2,949 | | | | | | | | |
| Tomcod | | | | | 40,000 | 600 | | | | |
| Wolffish | | | | | | | | | 1,956 | 21 |
| Yellow perch | 388 | 45 | | | | | | | | |
| Total | 38,842 | 3,154 | 1,347,816 | 12,234 | 165,213 | 22,578 | 1,550 | 293 | 3,802,788 | 130,236 |

| Species | Box traps | | Pots | | | | | | Harpoons, swordfish | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Eel | | Lobster | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | 31,875 | $4,232 | | | 139,680 | $10,442 | | | | |
| Spearfish | | | | | | | | | 94 | $11 |
| Swordfish | | | | | | | | | 572,519 | 93,214 |
| Tuna or "horse mackerel" | | | | | | | | | 140,918 | 6,873 |
| Crabs, hard | | | 991,353 | $29,390 | | | 132,000 | $4,390 | | |
| Lobsters | | | 14,771 | 4,654 | | | 7,735,875 | 2,002,674 | | |
| Total | 31,875 | 4,232 | 1,006,124 | 34,044 | 139,680 | 10,442 | 7,867,875 | 2,007,064 | 713,531 | 100,098 |

| Species | Spears | | Dredges, scallop | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | 36,545 | 4,711 | | | | | | | | |
| Clams: | | | | | | | | | | |
| Cockle | | | | | | | | | 4,206 | $210 |
| Soft, public | | | | | 9,457,338 | $334,862 | 191,250 | $6,750 | | |
| Soft, private | | | | | 276,080 | 7,364 | | | | |
| Scallops, sea | | | 436,416 | $109,201 | | | | | | |
| Total | 36,545 | 4,711 | 436,416 | 109,201 | 9,733,418 | 342,226 | 191,250 | 6,750 | 4,206 | 210 |

*Fisheries of Maine, 1930*—Continued

OPERATING UNITS: BY COUNTIES

| Item | Cumberland | Hancock | Kennebec | Knox | Lincoln | Penobscot | Sagadahoc | Waldo | Washington | York |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | 256 | 15 | ------ | 89 | 48 | ------ | ------ | ------ | 23 | 8 |
| On boats and shore— | | | | | | | | | | |
| Regular | 603 | 930 | ------ | 606 | 400 | ------ | 145 | 23 | 866 | 187 |
| Casual | ------ | 251 | 2 | 133 | 177 | 15 | 208 | 85 | 81 | ------ |
| Total | 859 | 1,196 | 2 | 828 | 625 | 15 | 353 | 108 | 970 | 195 |
| Vessels: | | | | | | | | | | |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | 14 | 5 | ------ | 19 | 7 | ------ | ------ | ------ | 3 | 1 |
| 11 to 20 tons | 12 | ------ | ------ | 5 | 2 | ------ | ------ | ------ | 1 | 1 |
| 21 to 30 tons | 2 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ |
| 31 to 40 tons | 2 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| 41 to 50 tons | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ |
| 51 to 60 tons | 2 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Total | 32 | 5 | ------ | 24 | 9 | ------ | ------ | ------ | 6 | 2 |
| Net tonnage | 529 | 31 | ------ | 202 | 78 | ------ | ------ | ------ | 102 | 20 |
| Sail—10 to 20 tons | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Net tonnage | 19 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Total vessels | 33 | 5 | ------ | 24 | 9 | ------ | ------ | ------ | 6 | 2 |
| Total net tonnage | 548 | 31 | ------ | 202 | 78 | ------ | ------ | ------ | 102 | 20 |
| Boats: | | | | | | | | | | |
| Motor | 324 | 526 | 1 | 438 | 206 | 1 | 57 | 18 | 500 | 95 |
| Other | 163 | 551 | 1 | 126 | 119 | 14 | 66 | 42 | 594 | 50 |
| Accessory boats | 140 | 1 | ------ | 24 | 12 | ------ | ------ | ------ | 9 | 3 |
| Apparatus: | | | | | | | | | | |
| Purse seines— | | | | | | | | | | |
| Mackerel | 9 | ------ | ------ | 7 | 14 | ------ | ------ | ------ | ------ | 1 |
| Length, yards | 2,215 | ------ | ------ | 2,400 | 3,155 | ------ | ------ | ------ | ------ | 224 |
| Other | 6 | 4 | ------ | 7 | 4 | ------ | 1 | ------ | 6 | ------ |
| Length, yards | 870 | 922 | ------ | 1,412 | 970 | ------ | 140 | ------ | 2,410 | ------ |
| Haul seines | 36 | 7 | ------ | 16 | 10 | ------ | 6 | ------ | 2 | 1 |
| Length, yards | 3,380 | 1,226 | ------ | 1,980 | 1,540 | ------ | 600 | ------ | 1,200 | 100 |
| Gill nets— | | | | | | | | | | |
| Anchor | 412 | 32 | ------ | 53 | 315 | 91 | 6 | 44 | 281 | 181 |
| Square yards | 67,220 | 8,920 | ------ | 14,190 | 50,240 | 3,[illegible] | 1,080 | 1,919 | 34,756 | 27,910 |
| Drift | 45 | 2 | ------ | ------ | 4 | 1 | 2 | ------ | ------ | 20 |
| Square yards | 6,840 | 640 | ------ | ------ | 461 | 300 | 240 | ------ | ------ | 3,200 |
| Stake | ------ | 4 | ------ | ------ | ------ | 101 | ------ | ------ | ------ | ------ |
| Square yards | ------ | 240 | ------ | ------ | ------ | 4,485 | ------ | ------ | ------ | ------ |
| Lines— | | | | | | | | | | |
| Hand | 78 | 1,933 | ------ | 560 | 732 | ------ | 825 | 80 | 167 | ------ |
| Hooks | 88 | 1,951 | ------ | 560 | 732 | ------ | 825 | 80 | 167 | ------ |
| Trawl | 10,210 | 8,250 | ------ | 6,860 | 1,910 | ------ | 1,350 | 40 | 3,010 | 1,420 |
| Hooks | 510,500 | 412,500 | ------ | 339,400 | 95,500 | ------ | 67,500 | 2,000 | 129,700 | 72,000 |
| Floating traps | 11 | ------ | ------ | ------ | 2 | ------ | 9 | 3 | ------ | ------ |
| Weirs | ------ | 74 | ------ | 17 | 4 | 4 | 3 | 18 | 93 | ------ |
| Fyke nets | ------ | ------ | 18 | ------ | 21 | ------ | 20 | ------ | ------ | ------ |
| Dip nets | ------ | 9 | ------ | 7 | 15 | ------ | 2 | 30 | 41 | ------ |
| Bag nets | ------ | 29 | ------ | ------ | ------ | 6 | 5 | 44 | 81 | ------ |
| Pocket nets | ------ | ------ | ------ | ------ | ------ | ------ | 7 | ------ | 10 | ------ |
| Otter trawls | 14 | 15 | ------ | 6 | 1 | ------ | ------ | ------ | ------ | ------ |
| Yards at mouth | 363 | 571 | ------ | 150 | 33 | ------ | ------ | ------ | ------ | ------ |
| Box traps | ------ | 3 | ------ | 3 | 1 | ------ | ------ | ------ | 3 | ------ |
| Pots— | | | | | | | | | | |
| Crab | 805 | ------ | ------ | 60 | 210 | ------ | ------ | ------ | 500 | ------ |
| Eel | 75 | 60 | ------ | 20 | ------ | 10 | 75 | 55 | ------ | 145 |
| Lobster | 23,104 | 51,774 | ------ | 49,556 | 22,616 | ------ | 3,213 | 440 | 47,644 | 6,955 |
| Harpoons, swordfish | 28 | ------ | ------ | 1 | 4 | ------ | 8 | ------ | ------ | 3 |
| Spears | ------ | 2 | ------ | 15 | 5 | ------ | 12 | ------ | 3 | 4 |
| Dredges, scallop | 10 | 64 | ------ | 23 | ------ | ------ | ------ | ------ | 16 | ------ |
| Yards at mouth | 13 | 84 | ------ | 43 | ------ | ------ | ------ | ------ | 17 | ------ |
| Forks | 271 | 451 | ------ | 149 | 191 | ------ | 79 | 12 | 355 | 90 |
| Hoes | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 16 | ------ |

*Fisheries of Maine, 1930*—Continued

CATCH: BY COUNTIES

| Species | Cumberland | | Hancock | | Kennebec | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 501,016 | $3,878 | | |
| Bluefish | 200 | $19 | | | | |
| Butterfish | 26,540 | 2,606 | | | | |
| Catfish and bullheads | 15,425 | 158 | | | | |
| Cod | 4,316,774 | 142,726 | 3,302,790 | 69,408 | | |
| Cusk | 860,739 | 19,947 | 140,517 | 1,700 | | |
| Eels | 23,000 | 1,740 | 30,075 | 2,208 | 1,520 | $152 |
| Flounders | 442,043 | 11,048 | 872,249 | 58,577 | | |
| Haddock | 4,911,785 | 171,963 | 2,337,586 | 50,559 | | |
| Hake | 2,741,367 | 44,739 | 5,543,920 | 38,791 | | |
| Halibut | 19,203 | 3,263 | 29,308 | 4,865 | | |
| Herring, sea | 12,795,175 | 80,107 | 10,440,248 | 44,666 | | |
| Mackerel | 1,120,486 | 36,706 | | | | |
| Pollock | 1,223,166 | 17,548 | 342,832 | 3,980 | | |
| Rosefish | 3,845 | 34 | | | | |
| Salmon | 1,971 | 418 | 35,092 | 11,128 | | |
| Shad | 60,604 | 978 | | | | |
| Sharks | 41,010 | 1,039 | | | | |
| Smelts | 92,467 | 14,321 | 170,443 | 34,374 | | |
| Spearfish | 94 | 11 | | | | |
| Sturgeon | 190 | 16 | | | | |
| Suckers | | | | | 21,314 | 1,705 |
| Swordfish | 571,853 | 93,134 | | | | |
| Tomcod | 11,252 | 297 | | | | |
| Tuna or "horse mackerel" | 59,511 | 2,656 | | | | |
| Whiting | 28,630 | 168 | | | | |
| Wolffish | 51,710 | 686 | | | | |
| Crabs, hard | 766,853 | 22,961 | 1,000 | 10 | | |
| Lobsters | 1,051,067 | 298,211 | 1,915,824 | 474,327 | | |
| Squid | 34,040 | 340 | | | | |
| Clams: | | | | | | |
| Soft, public | 1,741,208 | 96,683 | 2,425,084 | 59,865 | | |
| Soft, private | | | 19,040 | 560 | | |
| Scallops, sea | 4,800 | 1,800 | 135,798 | 52,292 | | |
| Total | 33,017,008 | 1,066,323 | 28,242,822 | 911,188 | 22,834 | 1,857 |

| Species | Knox | | Lincoln | | Penobscot | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 577,716 | $3,091 | 750,500 | $7,978 | | |
| Butterfish | | | 10,600 | 1,060 | | |
| Cod | 2,267,003 | 51,340 | 1,171,903 | 27,975 | | |
| Cusk | 130,165 | 2,804 | 111,851 | 2,197 | | |
| Eels | 24,700 | 3,445 | 3,400 | 336 | 200 | $17 |
| Flounders | 596,315 | 17,458 | 37,018 | 1,736 | | |
| Haddock | 2,734,758 | 79,924 | 684,145 | 17,602 | | |
| Hake | 1,712,896 | 15,932 | 864,102 | 8,661 | | |
| Halibut | 14,839 | 2,533 | 6,663 | 1,251 | | |
| Herring, sea | 9,069,902 | 49,136 | 7,315,260 | 65,159 | | |
| Mackerel | 168,643 | 8,781 | 1,116,428 | 49,533 | | |
| Pollock | 175,945 | 2,542 | 91,170 | 1,360 | | |
| Salmon | | | 1,250 | 333 | 17,952 | 5,088 |
| Shad | 19,400 | 291 | 7,900 | 459 | | |
| Smelts | 140,537 | 21,304 | 48,533 | 7,790 | 29,099 | 4,365 |
| Suckers | | | 5,045 | 404 | | |
| Swordfish | 666 | 80 | | | | |
| Tuna or "horse mackerel" | | | 19,680 | 1,181 | | |
| Whiting | 12,000 | 60 | | | | |
| Wolffish | 2,283 | 23 | 550 | 7 | | |
| Yellow perch | | | 138 | 17 | | |
| Crabs, hard | 10,000 | 500 | 323,000 | 10,140 | | |
| Lobsters | 1,998,295 | 532,974 | 917,498 | 235,964 | | |
| Squid | | | 22,100 | 221 | | |
| Clams: | | | | | | |
| Soft, public | 743,002 | 26,077 | 903,652 | 30,011 | | |
| Soft, private | | | 257,040 | 6,804 | | |
| Scallops, sea | 270,702 | 52,219 | | | | |
| Total | 20,669,767 | 870,514 | 14,669,426 | 478,179 | 47,251 | 9,470 |

*Fisheries of Maine, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Sagadahoc | | Waldo | | Washington | | York | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 82,000 | $656 | 6,665 | $200 | 211,598 | $1,566 | | |
| Butterfish | 75,000 | 11,225 | | | | | | |
| Cod | 548,080 | 16,079 | 51,000 | 1,230 | 1,188,792 | 28,613 | 637,622 | $19,360 |
| Cusk | 12,790 | 255 | | | 34,507 | 345 | 63,414 | 1,307 |
| Eels | 46,305 | 2,631 | 39,900 | 3,191 | 24,725 | 3,677 | 48,150 | 4,815 |
| Flounders | | | | | | | 2,341 | 70 |
| Haddock | 190,870 | 5,721 | 23,665 | 710 | 798,912 | 18,808 | 826,417 | 26,486 |
| Hake | 117,500 | 1,175 | 32,750 | 655 | 466,423 | 3,512 | 206,439 | 2,870 |
| Halibut | 2,400 | 360 | | | 26,313 | 4,731 | 4,618 | 705 |
| Herring, sea | 1,725,000 | 10,870 | 136,500 | 615 | 32,396,695 | 134,559 | 60,000 | 600 |
| Mackerel | 272,400 | 8,940 | 6,000 | 300 | | | 358,200 | 13,778 |
| Pollock | 32,400 | 324 | | | 111,406 | 1,926 | 68,223 | 936 |
| Salmon | 1,950 | 488 | 22,750 | 7,114 | 7,330 | 2,696 | | |
| Shad | | | | | 731 | 73 | | |
| Smelts | 68,650 | 13,258 | 82,133 | 12,605 | 82,181 | 17,382 | 6,665 | 1,000 |
| Sturgeon | 250 | 50 | | | | | | |
| Suckers | 10,500 | 840 | | | | | | |
| Tomcod | | | 40,000 | 600 | | | | |
| Tuna or "horse mackerel" | 56,927 | 2,748 | | | | | 4,800 | 288 |
| Wolffish | | | | | | | 14,927 | 167 |
| Yellow perch | 250 | 28 | | | | | | |
| Crabs, hard | | | | | 22,500 | 169 | | |
| Lobsters | 182,422 | 47,875 | 8,957 | 2,801 | 1,372,652 | 328,936 | 303,967 | 86,255 |
| Squid | 63,000 | 624 | | | | | | |
| Clams: | | | | | | | | |
| Cockle | | | | | 4,206 | 210 | | |
| Soft, public | 405,960 | 16,003 | 35,020 | 2,840 | 2,874,462 | 79,533 | 520,200 | 30,600 |
| Scallops, sea | | | | | 25,116 | 2,890 | | |
| Total | 3,894,654 | 140,150 | 485,340 | 32,862 | 39,648,549 | 629,626 | 3,125,983 | 189,237 |

*Industries related to the fisheries of Maine, 1930*

TRANSPORTING

| Item | Cumberland County | Hancock County | Knox County | Washington County | Total |
|---|---|---|---|---|---|
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On transporting vessels | 22 | 23 | 18 | 176 | 239 |
| On transporting boats | | | | 1 | 1 |
| Total | 22 | 23 | 18 | 177 | 240 |
| Vessels: | | | | | |
| *Motor*— | | | | | |
| 5 to 10 tons | 9 | 7 | 6 | 43 | 65 |
| 11 to 20 tons | 2 | 4 | 3 | 33 | 42 |
| 21 to 30 tons | | | | 6 | 6 |
| 31 to 40 tons | | | | 1 | 1 |
| 41 to 50 tons | | | | 1 | 1 |
| Total | 11 | 11 | 9 | 84 | 115 |
| Net tonnage | 96 | 111 | 79 | 974 | 1,260 |
| Boats | | | | 1 | 1 |

*Industries related to the fisheries of Maine, 1930*—Continued

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Cumberland County | Hancock County | Knox County | Lincoln County | Penobscot, Sagadahoc, and York Counties | Washington County | Total |
|---|---|---|---|---|---|---|---|
| Establishments | 29 | 29 | 33 | 13 | 4 | 79 | 187 |
| Persons engaged: | | | | | | | |
| Proprietors | 43 | 32 | 29 | 12 | 5 | 93 | 214 |
| Salaried employees | 59 | 9 | 24 | 7 | 1 | 54 | 154 |
| Wage earners— | | | | | | | |
| Average for season | 1,428 | 614 | 474 | 209 | 21 | 3,143 | 5,809 |
| Average for year | 440 | 199 | 170 | 98 | 21 | 886 | 1,814 |
| Paid to salaried employees | $153,317 | $31,126 | $74,971 | $8,877 | $7,800 | $128,032 | $404,123 |
| Paid to wage earners | 399,505 | 177,969 | 145,919 | 78,788 | 34,005 | 581,900 | 1,418,086 |
| Total salaries and wages | 552,822 | 209,095 | 220,890 | 87,665 | 41,805 | 709,932 | 1,822,209 |

PRODUCTS MANUFACTURED [1]

| Item | Quantity | Value |
|---|---|---|
| Alewives, salted ... pounds | 582,400 | $15,119 |
| Cod: | | |
| Fresh sticks ... do | 280,390 | 49,486 |
| Salted ... do | 1,477,124 | 85,504 |
| Fish cakes, canned ... standard cases | 9,051 | 59,520 |
| Oil, cod-liver ... gallons | 33,904 | 21,662 |
| Cusk: | | |
| Fresh sticks ... pounds | 150,490 | 25,732 |
| Salted ... do | 85,269 | 3,839 |
| Flounders, fresh fillets ... do | 8,960 | 1,402 |
| Haddock: | | |
| Fresh sticks ... do | 183,470 | 31,564 |
| Fresh fillets ... do | 504,988 | 84,609 |
| Frozen fillets ... do | 566,349 | 66,702 |
| Salted ... do | 121,367 | 6,253 |
| Finnan haddie ... do | 178,800 | 25,370 |
| Smoked fillets ... do | 193,150 | 38,530 |
| Hake: | | |
| Fresh sticks ... do | 214,000 | 35,092 |
| Fresh fillets ... do | 39,605 | 4,437 |
| Salted ... do | 3,195,722 | 86,051 |
| Herring, sea: | | |
| Smoked— | | |
| Bloaters ... do | 1,639,445 | 76,434 |
| Boneless ... do | 1,387,750 | 149,283 |
| Lengthwise ... do | 127,794 | 12,780 |
| Medium-scaled ... do | 265,088 | 26,263 |
| Miscellaneous ... do | 54,447 | 8,209 |
| Canned, "sardines" ... standard cases | 1,399,212 | 4,459,071 |
| Meal ... tons | 2,126 | 77,913 |
| Scrap, dry pomace ... do | 3,736 | 7,592 |
| Oil ... gallons | 125,242 | 32,346 |
| Scales ... pounds | 81,153 | 1,932 |
| Pollock, salted ... do | 173,067 | 8,381 |
| Soft clams: | | |
| Canned— | | |
| Whole ... standard cases | 95,203 | 419,636 |
| Chowder ... do | 56,926 | 177,991 |
| Juice and bouillon ... do | 16,388 | 54,782 |
| Unclassified products: | | |
| Fresh and frozen [2] ... pounds | 173,113 | 22,953 |
| Salted [3] ... do | 290,391 | 46,014 |
| Smoked [4] ... do | 75,397 | 10,273 |
| Canned [5] ... standard cases | 44,955 | 451,259 |
| Meal, ground fish ... tons | 896 | 45,082 |
| By-products [6] | (7) | 148,750 |
| Total | | 6,877,816 |

[1] Includes a small quantity of fish smoked in Rockingham County, N. H.
[2] Includes fresh cod and cusk fillets; frozen cod, cusk, flounders, hake, and wolffish fillets; and frozen hake sticks.
[3] Includes salt cod bits, boneless cod, cheeks, tongues and sounds, herring, mackerel fillets, and mackerel split; and pickled herring.
[4] Includes smoked cod fillets, cusk fillets, and hake fillets.
[5] Includes canned clam cakes, finnan haddie, fish flakes, haddock fillets and smoked herring.
[6] Includes glue, herring skins, herring dry scrap, clam meal, tanners' oil, and buttons made from imported shells.
[7] Data not available.

*Industries related to the fisheries of Maine, 1930*—Continued

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 223]

| Item | | Quantity | Value |
|---|---|---|---|
| Alewives: | | | |
| Salted | pounds | 322,025 | $8,057 |
| Smoked | do | 208,063 | 6,937 |
| Cod, salted | do | 10,407 | 765 |
| Cusk, salted | do | 2,308 | 92 |
| Hake, salted | do | 685 | 27 |
| Herring, sea, salted | do | 9,170 | 447 |
| Mackerel, salted | do | 665 | 13 |
| Pollock, salted | do | 2,665 | 118 |
| Crab meat, packaged (fresh-cooked) | do | 15,600 | 7,800 |
| Scallops, sea, fresh-shucked | gallons | 57,476 | 109,700 |
| Total | | | 133,956 |

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 174 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## NEW HAMPSHIRE

*Fisheries of New Hampshire, 1930* [1]

OPERATING UNITS: BY GEAR

| Item | Purse seines, mackerel | Haul seines | Lines | | Pots, lobster | Harpoons, swordfish | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | | | Hand | Trawl | | | |
| Fishermen: | | | | | | | |
| On boats and shore— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | 6 | 3 | | 12 | 34 | 4 | 46 |
| Casual | | | 40 | | | | 40 |
| Total | 6 | 3 | 40 | 12 | 34 | 4 | 86 |
| Boats: | | | | | | | |
| Motor | 2 | 1 | | 6 | 32 | 2 | 38 |
| Other | 2 | 1 | | | 2 | | 5 |
| Apparatus: | | | | | | | |
| Number | 2 | 1 | 160 | 3,600 | 2,570 | 2 | |
| Length, yards | 500 | 100 | | | | | |
| Hooks | | | 160 | 180,000 | | | |

CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Lines | | | | Pots, lobster | | Harpoons, swordfish | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Hand | | Trawl | | | | | |
| | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* |
| Cod | | | | | | | 157,800 | $3,945 | | | | |
| Cusk | | | | | | | 7,890 | 117 | | | | |
| Flounders | | | | | | | 15,780 | 473 | | | | |
| Haddock | | | | | | | 394,000 | 15,780 | | | | |
| Hake | | | | | | | 78,900 | 1,174 | | | | |
| Halibut | | | | | | | 300 | 45 | | | | |
| Herring, sea | | | 60,000 | $450 | | | | | | | | |
| Mackerel | 100,000 | $4,000 | | | | | | | | | | |
| Pollock | | | | | | | 39,450 | 562 | | | | |
| Smelt | | | | | 8,000 | $1,600 | | | | | | |
| Tuna or "horse mackerel" | | | | | | | | | | | 2,700 | $162 |
| Wolffish | | | | | | | 23,670 | 473 | | | | |
| Lobsters | | | | | | | | | 180,587 | $40,363 | | |
| Total | 100,000 | 4,000 | 60,000 | 450 | 8,000 | 1,600 | 717,790 | 22,569 | 180,587 | 40,363 | 2,700 | 162 |

[1] The fisheries of New Hampshire are confined to Rockingham County.

*Industries related to the fisheries of New Hampshire, 1930*

TRANSPORTING

| | |
|---|---|
| Persons engaged on vessels | 3 |
| Vessels: | |
| Number | 1 |
| Net tonnage | 16 |

WHOLESALE AND MANUFACTURING IN ROCKINGHAM COUNTY

OPERATING UNITS, SALARIES, AND WAGES

| | |
|---|---|
| Establishments | 3 |
| Persons engaged: | |
| Proprietors | 5 |
| Wage earners [1] | 9 |
| Paid to salaried employees and wage earners | $17,780 |

NOTE.—A small amount of smoked fish produced in New Hampshire has been included with Maine to avoid the disclosure of private enterprise.

## MASSACHUSETTS

*Fisheries of Massachusetts, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | Lines | | Pound nets | Floating traps | Weirs |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | Anchor | Drift | Hand | Trawl | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | 1,019 | | | 209 | 681 | 254 | 1,243 | | | |
| On boats and shore— | | | | | | | | | | |
| Regular | 74 | 2 | 34 | 70 | 187 | 173 | 535 | 196 | 34 | 8 |
| Casual | | 6 | 8 | 2 | 3 | 10 | 1 | | | |
| Total | 1,093 | 8 | 42 | 281 | 871 | 437 | 1,779 | 196 | 34 | 8 |
| Vessels: | | | | | | | | | | |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | 5 | | | 4 | 7 | 1 | 5 | | | |
| 11 to 20 tons | 33 | | | 8 | 40 | 6 | 18 | | | |
| 21 to 30 tons | 16 | | | 9 | 12 | 1 | 1 | | | |
| 31 to 40 tons | 11 | | | | 7 | 1 | 2 | | | |
| 41 to 50 tons | 9 | | | 1 | 6 | | 6 | | | |
| 51 to 60 tons | 9 | | | | 3 | 3 | 10 | | | |
| 61 to 70 tons | 5 | | | | 1 | 4 | 14 | | | |
| 71 to 80 tons | | | | | | 1 | 7 | | | |
| 81 to 90 tons | 2 | | | | | 1 | 3 | | | |
| 91 to 100 tons | 1 | | | | | | 3 | | | |
| 111 to 120 tons | | | | | | | 2 | | | |
| 121 to 130 tons | | | | | | | 1 | | | |
| 131 to 140 tons | | | | | | | 1 | | | |
| Total | 91 | | | 22 | 76 | 18 | 73 | | | |
| Net tonnage | 2,823 | | | 433 | 1,699 | 729 | 3,685 | | | |
| Sail—5 to 10 tons | | | | | | 1 | | | | |
| Net tonnage | | | | | | 6 | | | | |
| Total vessels | 91 | | | 22 | 76 | 19 | 73 | | | |
| Total net tonnage | 2,823 | | | 433 | 1,699 | 735 | 3,685 | | | |
| Boats: | | | | | | | | | | |
| Motor | 14 | 3 | 8 | 49 | 67 | 118 | 202 | 59 | 13 | 2 |
| Other | 15 | 5 | 18 | 41 | 44 | 33 | 24 | 102 | 19 | 4 |
| Accessory boats | 109 | | | | 50 | 9 | 643 | | | |
| Apparatus: | | | | | | | | | | |
| Number | 105 | 3 | 13 | 2,034 | 9,461 | 583 | 54,956 | 136 | 19 | 6 |
| Length, yards | 50,098 | 410 | 2,225 | | | | | | | |
| Square yards | | | | 653,340 | 3,286,236 | | | | | |
| Hooks, baits, or snoods | | | | | | 849 | 2,730,464 | | | |

[1] Salaried employees are included with wage earners.

*Fisheries of Massachusetts, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Fyke nets | Dip nets | Push nets | Otter trawls | Box traps | Pots | | | | Harpoons, swordfish |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Crab | Eel | Lobster | Periwinkle or cockle | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | | | | 2,410 | | | | 5 | | 979 |
| On boats and shore— | | | | | | | | | | |
| Regular | 19 | 110 | 18 | 190 | 5 | 22 | 52 | 635 | 11 | 49 |
| Casual | 8 | 13 | 35 | | | | 7 | 287 | | |
| Total | 27 | 123 | 53 | 2,600 | 5 | 22 | 59 | 927 | 11 | 1,028 |
| Vessels: | | | | | | | | | | |
| *Steam*— | | | | | | | | | | |
| 91 to 100 tons | | | | 5 | | | | | | |
| 111 to 120 tons | | | | 6 | | | | | | |
| 121 to 130 tons | | | | 1 | | | | | | |
| 131 to 140 tons | | | | 1 | | | | | | |
| 151 to 160 tons | | | | 1 | | | | | | |
| 171 to 180 tons | | | | 2 | | | | | | |
| 181 to 190 tons | | | | 1 | | | | | | |
| 201 to 210 tons | | | | 1 | | | | | | |
| 211 to 220 tons | | | | 2 | | | | | | |
| 241 to 250 tons | | | | 1 | | | | | | |
| 261 to 270 tons | | | | 1 | | | | | | |
| Total | | | | 22 | | | | | | |
| Net tonnage | | | | 3,291 | | | | | | |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | | | | 25 | | | | 3 | | 10 |
| 11 to 20 tons | | | | 79 | | | | | | 31 |
| 21 to 30 tons | | | | 23 | | | | | | 8 |
| 31 to 40 tons | | | | 14 | | | | | | 7 |
| 41 to 50 tons | | | | 15 | | | | | | 5 |
| 51 to 60 tons | | | | 25 | | | | | | 15 |
| 61 to 70 tons | | | | 10 | | | | | | 6 |
| 71 to 80 tons | | | | 9 | | | | | | 6 |
| 81 to 90 tons | | | | 3 | | | | | | 1 |
| 91 to 100 tons | | | | 7 | | | | | | |
| 101 to 110 tons | | | | 5 | | | | | | |
| 111 to 120 tons | | | | 13 | | | | | | |
| 131 to 140 tons | | | | | | | | | | 1 |
| 151 to 160 tons | | | | 1 | | | | | | |
| 161 to 170 tons | | | | 1 | | | | | | |
| 171 to 180 tons | | | | 2 | | | | | | |
| 201 to 210 tons | | | | 1 | | | | | | |
| Total | | | | 233 | | | | 3 | | 90 |
| Net tonnage | | | | 9,649 | | | | 21 | | 3,139 |
| Total vessels | | | | 255 | | | | 3 | | 90 |
| Total net tonnage | | | | 12,940 | | | | 21 | | 3,139 |
| Boats: | | | | | | | | | | |
| Motor | 3 | 27 | | 76 | | 22 | 37 | 643 | 7 | 17 |
| Other | 19 | 11 | 28 | | 1 | | 26 | 431 | 4 | 29 |
| Accessory boats | | | | | | | | 12 | | 203 |
| Apparatus: | | | | | | | | | | |
| Number | 52 | 61 | 53 | 331 | 1 | 1,735 | 1,782 | 69,249 | 1,012 | 107 |
| Yards at mouth | | | | 9,750 | | | | | | |

*Fisheries of Massachusetts, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Spears | Dredges | | | Tongs | Rakes | Forks | Hoes | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Clam | Oyster | Scallop | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | | 26 | 11 | 68 | | 8 | | | | 4,445 |
| On boats and shore— | | | | | | | | | | |
| Regular | 114 | 123 | 18 | 371 | 137 | 436 | 343 | 322 | 10 | 2,859 |
| Casual | 97 | | 6 | 464 | 45 | 114 | 195 | 258 | 21 | 1,377 |
| Total | 211 | 149 | 35 | 903 | 182 | 558 | 538 | 580 | 31 | 8,681 |
| Vessels: | | | | | | | | | | |
| Steam— | | | | | | | | | | |
| 91 to 100 tons | | | | | | | | | | 5 |
| 111 to 120 tons | | | | | | | | | | 6 |
| 121 to 130 tons | | | | | | | | | | 1 |
| 131 to 140 tons | | | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | | | 1 |
| 171 to 180 tons | | | | | | | | | | 2 |
| 181 to 190 tons | | | | | | | | | | 1 |
| 201 to 210 tons | | | | | | | | | | 1 |
| 211 to 220 tons | | | | | | | | | | 2 |
| 241 to 250 tons | | | | | | | | | | 1 |
| 261 to 270 tons | | | | | | | | | | 1 |
| Total | | | | | | | | | | 22 |
| Net tonnage | | | | | | | | | | 3,291 |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | | 5 | 3 | 8 | | 1 | | | | 50 |
| 11 to 20 tons | | 5 | 1 | 7 | | 2 | | | | 130 |
| 21 to 30 tons | | | | | | | | | | 38 |
| 31 to 40 tons | | | | 1 | | | | | | 24 |
| 41 to 50 tons | | | | | | | | | | 25 |
| 51 to 60 tons | | | | | | | | | | 41 |
| 61 to 70 tons | | | | | | | | | | 27 |
| 71 to 80 tons | | | | | | | | | | 17 |
| 81 to 90 tons | | | | | | | | | | 6 |
| 91 to 100 tons | | | | | | | | | | 10 |
| 101 to 110 tons | | | | | | | | | | 5 |
| 111 to 120 tons | | | | | | | | | | 15 |
| 121 to 130 tons | | | | | | | | | | 1 |
| 131 to 140 tons | | | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | | | 1 |
| 161 to 170 tons | | | | | | | | | | 1 |
| 171 to 180 tons | | | | | | | | | | 2 |
| 201 to 210 tons | | | | | | | | | | 1 |
| Total | | 10 | 4 | 16 | | 3 | | | | 395 |
| Net tonnage | | 92 | 40 | 200 | | 30 | | | | 15,384 |
| Sail—5 to 10 tons | | | | | | | | | | 1 |
| Net tonnage | | | | | | | | | | 6 |
| Total vessels | | 10 | 4 | 16 | | 3 | | | | 418 |
| Total net tonnage | | 92 | 40 | 200 | | 30 | | | | 18,681 |
| Boats: | | | | | | | | | | |
| Motor | | 67 | 10 | 556 | 65 | 72 | 16 | 28 | | 1,669 |
| Other | 68 | | | | 112 | 469 | 97 | 248 | | 1,477 |
| Accessory boats | | | | | | | | | | 979 |
| Apparatus: | | | | | | | | | | |
| Number | 201 | 78 | 26 | 2,877 | 183 | 552 | 538 | 610 | | |
| Yards at mouth | | 40 | 27 | 2,337 | | | | | | |

*Fisheries of Massachusetts, 1930*—Continued

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Lbs.* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 194,600 | $2,349 | | | 879,000 | $8,790 | | | | |
| Bluefish | | | | | 900 | 108 | 4,215 | $889 | 28,000 | $2,800 |
| Butterfish | 17,130 | 1,203 | | | | | 2,450 | 180 | 500 | 45 |
| Catfish and bullheads | | | | | | | 13,200 | 480 | | |
| Cod | | | | | | | 4,198,601 | 181,595 | | |
| Cusk | | | | | | | 7,581 | 136 | | |
| Flounders | | | | | | | 2,595 | 101 | | |
| Haddock | | | | | | | 1,488,224 | 49,443 | | |
| Hake | | | | | | | 1,189,261 | 18,982 | | |
| Herring, sea | 331,660 | 4,058 | | | 2,500 | 38 | | | 6,000 | 120 |
| Launce | | | 80,750 | $1,340 | 80,000 | 1,600 | | | | |
| Mackerel | 38,390,393 | 1,289,713 | | | 23,500 | 1,175 | 253,555 | 12,639 | 5,106,885 | 200,604 |
| Pollock | | | | | | | 8,577,040 | 132,399 | | |
| Sea bass | | | | | | | | | 1,000 | 150 |
| Shad | 19,001 | 367 | | | 8,000 | 560 | 4,588 | 295 | 100 | 8 |
| Sharks | 1,921 | 104 | | | | | 9,771 | 352 | | |
| Skates | | | | | | | 388 | 25 | | |
| Striped bass | | | | | 16,000 | 3,875 | | | | |
| White perch | | | | | 450 | 45 | | | | |
| Wolffish | | | | | | | 112 | 2 | | |
| Total | 38,954,705 | 1,297,794 | 80,750 | 1,340 | 1,010,350 | 16,191 | 15,751,581 | 397,518 | 5,142,485 | 203,727 |

| Species | Lines | | | | Pounds net | | Floating traps | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trawl | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 131,151 | $1,288 | 4,000 | $55 |
| Bluefish | 129,175 | $10,940 | | | 32,417 | 3,805 | 2,935 | 358 |
| Bonito | | | | | 80,617 | 6,357 | | |
| Butterfish | | | 540 | $27 | 551,879 | 45,053 | 56,099 | 4,954 |
| Carp | | | | | 2,976 | 59 | | |
| Catfish and bullheads | | | 24,140 | 598 | | | 385 | 14 |
| Cod | 3,361,921 | 97,077 | 29,646,776 | 902,932 | 42,241 | 1,384 | 43,345 | 1,288 |
| Cusk | 223,033 | 5,787 | 3,755,171 | 83,591 | | | | |
| Eels | 3,100 | 310 | 81,488 | 1,640 | 2,147 | 172 | | |
| Flounders | 52,380 | 2,088 | 2,474,152 | 110,500 | 39,793 | 2,141 | | |
| Grayfish | | | | | 56,196 | 2,370 | | |
| Haddock | 1,513,361 | 51,554 | 43,182,335 | 1,414,691 | | | 900 | 27 |
| Hake | 228,824 | 6,712 | 7,677,567 | 149,214 | | | | |
| Halibut | 60,953 | 10,222 | 2,140,082 | 322,505 | | | | |
| Herring, sea | | | | | 2,548,092 | 29,189 | 847,672 | 12,432 |
| King whiting or "Kingfish" | | | | | 200 | 21 | | |
| Launce | | | | | | | 9,676 | 194 |
| Mackerel | 23,500 | 1,445 | 495 | 59 | 1,198,023 | 42,835 | 353,908 | 13,502 |
| Pollock | 177,943 | 3,023 | 1,483,940 | 26,812 | 6,073 | 117 | 119,010 | 1,788 |
| Rosefish | | | 294 | 4 | | | | |
| Salmon | | | | | | | 30 | 9 |
| Scup or porgy | 469,370 | 23,623 | | | 176,897 | 6,603 | | |
| Sea bass | 73,718 | 6,146 | | | 2,760 | 437 | | |
| Sea robin | | | | | 100 | 1 | | |
| Shad | | | | | 21,967 | 1,688 | | |
| Sharks | | | | | 27,815 | 194 | | |
| Skates | | | 16,500 | 330 | 1,541 | 42 | | |
| Smelt | 6,200 | 2,717 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 1,238 | 149 | | |
| Spotted | | | | | 1,246 | 221 | | |
| Striped bass | 4,500 | 1,150 | | | 4,785 | 612 | | |
| Sturgeon | | | | | 695 | 191 | | |
| Swordfish | 266 | 62 | 21,116 | 4,094 | | | | |
| Tautog | 77,850 | 4,895 | | | 31,258 | 1,843 | | |
| Tuna or "horse mackerel" | | | 85 | 8 | 58,226 | 4,520 | 5,520 | 386 |
| Whiting | | | | | 5,349,460 | 46,793 | 1,809,440 | 15,402 |
| Wolffish | 30,431 | 646 | 346,574 | 8,944 | | | | |
| Squid | | | | | 3,128,549 | 51,404 | 367,011 | 7,460 |
| Total | 6,436,525 | 228,397 | 90,851,255 | 3,025,949 | 13,498,342 | 249,489 | 3,619,931 | 57,869 |

*Fisheries of Massachusetts, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Weirs | | Fyke nets | | Dip nets | | Push nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 3,245 | $4 | | | 474,400 | $4,269 | | |
| Bluefish | 12,000 | 1,800 | | | | | | |
| Bonito | 1,800 | 162 | | | | | | |
| Butterfish | 11,525 | 1,630 | | | | | | |
| Cod | 10,711 | 89 | | | | | | |
| Eels | | | 79,460 | $9,979 | | | | |
| Grayfish | 27,500 | 500 | | | | | | |
| Herring, sea | 53,625 | 1,030 | | | 4,897,500 | 66,600 | | |
| Mackerel | 53,449 | 2,865 | | | 100,000 | 1,800 | | |
| Minnows | | | | | 6,000 | 1,200 | | |
| Striped bass | 2,100 | 462 | | | | | | |
| Tautog | 602 | 20 | | | | | | |
| Tuna or "horse mackerel" | 1,200 | 120 | | | | | | |
| Whiting | 517,703 | 12,559 | | | | | | |
| Shrimp | | | | | 4,800 | 3,600 | | |
| Squid | 334,446 | 10,058 | | | | | | |
| Scallops: Bay | | | | | | | 70,200 | $20,550 |
| Total | 1,029,906 | 31,299 | 79,460 | 9,979 | 5,482,700 | 77,469 | 70,200 | 20,550 |

| Species | Otter trawls | | Box traps | | Pots | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | | Eel | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 800 | $28 | 100,000 | $750 | | | | |
| Bluefish | 665 | 52 | | | | | | |
| Butterfish | 214,990 | 19,075 | | | | | | |
| Catfish and bullheads | 64,400 | 1,290 | | | | | | |
| Cod | 40,218,629 | 1,173,983 | | | | | | |
| Croaker | 140,005 | 5,600 | | | | | | |
| Cunner | 18,735 | 574 | | | | | | |
| Cusk | 727,291 | 14,035 | | | | | | |
| Eels | 9,670 | 345 | | | | | 237,850 | $24,254 |
| Flounders | 28,759,989 | 1,147,628 | | | | | | |
| Frigate mackerel | 384,661 | 17,921 | | | | | | |
| Goosefish | 200 | 3 | | | | | | |
| Grayfish | 600 | 12 | | | | | | |
| Haddock | 156,502,969 | 4,925,534 | | | | | | |
| Hake | 10,144,917 | 237,150 | | | | | | |
| Halibut | 679,409 | 112,911 | | | | | | |
| Launce | | | | | | | 12,500 | 1,250 |
| Mackerel | 27,568 | 3,021 | | | | | | |
| Pollock | 4,650,670 | 97,333 | | | | | | |
| Rosefish | 109,563 | 2,185 | | | | | | |
| Salmon | 25 | 1 | | | | | | |
| Scup or porgy | 145,741 | 5,572 | | | | | | |
| Sea bass | 64,109 | 2,644 | | | | | | |
| Shad | 493 | 23 | | | | | | |
| Sharks | 8,783 | 287 | | | | | | |
| Skates | 33,374 | 419 | | | | | | |
| Smelt | 50 | 2 | | | | | | |
| Sturgeon | 7,050 | 824 | | | | | | |
| Swordfish | 18,515 | 3,008 | | | | | | |
| Tuna or "horse mackerel" | 1,035 | 189 | | | | | | |
| Whiting | 225,685 | 6,965 | | | | | | |
| Wolffish | 2,143,874 | 42,378 | | | | | | |
| Crabs, hard | | | | | 396,400 | $74,350 | | |
| Total | 245,304,465 | 7,820,992 | 100,000 | 750 | 396,400 | 74,350 | 250,350 | 25,504 |

*Fisheries of Massachusetts, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Pots | | | | Harpoons, swordfish | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | Lobster | | Periwinkle or cockle | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 2,650 | $97 | | |
| Eels | | | | | | | 65,350 | $7,766 |
| Flounders | | | | | | | 6,000 | 180 |
| Sharks | | | | | 779 | 39 | | |
| Swordfish | | | | | 3,688,436 | 650,429 | | |
| Crabs, hard | 61,898 | $11,930 | | | | | | |
| Lobsters | 2,338,234 | 625,946 | | | | | | |
| Clams, cockle | | | 9,450 | $1,975 | | | | |
| Periwinkles | | | 14,742 | 3,587 | | | | |
| Total | 2,400,132 | 637,876 | 24,192 | 5,562 | 3,691,865 | 650,565 | 71,350 | 7,946 |

| Species | Dredges | | | | | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | Clam | | Oyster | | Scallop | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Cockle | | | | | 11,700 | $1,950 | | |
| Hard, public | 906,712 | $182,847 | | | | | 149,560 | $43,250 |
| Hard, private | 14,400 | 3,000 | | | | | 3,600 | 2,049 |
| Surf or skimmer | | | | | 1,600 | 350 | | |
| Mussels | | | | | 10,800 | 2,100 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | | | 700 | 200 |
| Market, private, spring | | | 103,188 | $45,262 | 9,625 | 3,750 | 108,762 | 51,399 |
| Market, private, fall | | | 82,105 | 33,519 | 5,390 | 1,750 | 116,374 | 51,770 |
| Seed, private, spring | | | 63,000 | 4,500 | 38,808 | 1,386 | 14,000 | 1,000 |
| Seed, public, fall | | | | | | | 31,500 | 2,250 |
| Periwinkles | | | | | 2,700 | 300 | | |
| Scallops: | | | | | | | | |
| Bay | | | | | 1,351,444 | 372,265 | | |
| Sea | | | | | 510,738 | 77,122 | | |
| Total | 921,112 | 185,847 | 245,893 | 83,281 | 1,942,805 | 460,973 | 424,566 | 151,918 |

| Species | Rakes | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Cockle | | | | | | | 3,420 | $790 |
| Hard, public | 833,432 | $250,913 | | | | | | |
| Hard, private | 48,000 | 2,100 | | | | | | |
| Razor | | | | | 380,266 | $20,476 | | |
| Soft public | | | 1,794,992 | $145,327 | 1,478,660 | 130,607 | | |
| Surf or skimmer | | | | | 31,875 | 2,200 | 4,800 | 1,200 |
| Oysters, market, private, fall | 7,700 | 3,000 | | | | | | |
| Scallops, bay | | | | | | | 13,500 | 3,750 |
| Irish moss | 93,000 | 5,580 | | | | | | |
| Total | 982,132 | 261,593 | 1,794,992 | 145,327 | 1,890,801 | 153,283 | 21,720 | 5,740 |

*Fisheries of Massachusetts, 1930*—Continued

OPERATING UNITS: BY COUNTIES

| Item | Barnstable | Bristol | Dukes | Essex | Nantucket | Norfolk | Plymouth | Suffolk |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 132 | 185 | 37 | 1,977 | 76 | | 5 | 2,033 |
| On boats and shore— | | | | | | | | |
| Regular | 898 | 274 | 170 | 633 | 57 | 67 | 256 | 504 |
| Casual | 321 | 94 | 75 | 337 | 61 | 58 | 331 | 100 |
| Total | 1,351 | 553 | 282 | 2,947 | 194 | 125 | 592 | 2,637 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 91 to 100 tons | | | | | | | | 5 |
| 111 to 120 tons | | | | | | | | 6 |
| 121 to 130 tons | | | | | | | | 1 |
| 131 to 140 tons | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | 1 |
| 171 to 180 tons | | | | | | | | 2 |
| 181 to 190 tons | | | | 1 | | | | |
| 201 to 210 tons | | | | | | | | 1 |
| 211 to 220 tons | | | | | | | | 2 |
| 241 to 250 tons | | | | | | | | 1 |
| 261 to 270 tons | | | | | | | | 1 |
| Total | | | | 1 | | | | 21 |
| Net tonnage | | | | 184 | | | | 3,107 |
| Motor— | | | | | | | | |
| 5 to 10 tons | 13 | 5 | 3 | 8 | 8 | | 3 | 10 |
| 11 to 20 tons | 11 | 5 | 3 | 40 | 12 | | | 59 |
| 21 to 30 tons | | 5 | 1 | 18 | 1 | | | 13 |
| 31 to 40 tons | | 5 | | 12 | | | | 7 |
| 41 to 50 tons | | 4 | | 14 | | | | 7 |
| 51 to 60 tons | | 1 | | 25 | | | | 15 |
| 61 to 70 tons | 1 | | | 15 | | | | 11 |
| 71 to 80 tons | | | | 13 | | | | 4 |
| 81 to 90 tons | | | | 3 | | | | 3 |
| 91 to 100 tons | | | | 6 | | | | 4 |
| 101 to 110 tons | | | | 1 | | | | 4 |
| 111 to 120 tons | | | | 3 | | | | 12 |
| 121 to 130 tons | | | | | | | | 1 |
| 131 to 140 tons | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | 1 |
| 161 to 170 tons | | | | | | | | 1 |
| 171 to 180 tons | | | | | | | | 2 |
| 201 to 210 tons | | | | | | | | 1 |
| Total | 25 | 25 | 7 | 158 | 21 | | 3 | 156 |
| Net tonnage | 327 | 662 | 97 | 6,815 | 233 | | 25 | 7,225 |
| Sail, 5 to 10 tons | 1 | | | | | | | |
| Net tonnage | 6 | | | | | | | |
| Total vessels | 26 | 25 | 7 | 159 | 21 | | 3 | 177 |
| Total net tonnage | 333 | 662 | 97 | 6,999 | 233 | | 25 | 10,332 |
| Boats: | | | | | | | | |
| Motor | 497 | 202 | 160 | 283 | 74 | 43 | 249 | 161 |
| Other | 498 | 153 | 142 | 346 | 47 | 23 | 253 | 15 |
| Accessory boats | 35 | 7 | 18 | 590 | 9 | | | 320 |
| Apparatus: | | | | | | | | |
| Purse seines— | | | | | | | | |
| Mackerel | 4 | 3 | 1 | 59 | | | | 38 |
| Length, yards | 1,850 | 378 | 500 | 28,890 | | | | 18,480 |
| Other | 3 | | | | | | | |
| Length, yards | 410 | | | | | | | |
| Haul seines | 5 | 1 | 1 | 5 | | | 1 | |
| Length, yards | 1,300 | 100 | 450 | 350 | | | 25 | |
| Gill nets— | | | | | | | | |
| Anchor | 686 | | | 1,281 | | 7 | 6 | 54 |
| Square yards | 159,820 | | | 476,360 | | 1,680 | 1,440 | 14,040 |
| Drift | 1,022 | 210 | 143 | 5,524 | | | 47 | 2,515 |
| Square yards | 356,760 | 75,600 | 44,616 | 1,924,020 | | | 20,240 | 865,000 |
| Lines— | | | | | | | | |
| Hand | 56 | 148 | 19 | 278 | 2 | 10 | 14 | 56 |
| Hooks | 65 | 296 | 19 | 377 | 2 | 20 | 14 | 56 |
| Trawl | 4,736 | | 240 | 23,036 | | | 180 | 26,764 |
| Hooks | 236,800 | | 7,800 | 1,143,336 | | | 6,480 | 1,336,048 |

*Fisheries of Massachusetts, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Barnstable | Bristol | Dukes | Essex | Nantucket | Norfolk | Plymouth | Suffolk |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Pound nets | 97 | 15 | 14 | 1 | 4 | | 5 | |
| Floating traps | 7 | | | 12 | | | | |
| Weirs | 6 | | | | | | | |
| Fyke nets | 42 | 7 | 3 | | | | | |
| Dip nets | 17 | | | 8 | | 7 | 14 | 15 |
| Push nets | 45 | | | | 8 | | | |
| Otter trawls | 56 | 25 | 15 | 69 | 21 | | | 145 |
| Yards at mouth | 1,575 | 850 | 395 | 2,080 | 570 | | | 4,280 |
| Box traps | | | | | | | 1 | |
| Pots— | | | | | | | | |
| Crab | | | | | | 50 | 35 | 1,650 |
| Eel | 637 | 145 | 275 | 45 | 620 | | 60 | |
| Lobster | 8,752 | 11,980 | 8,779 | 19,129 | 1,221 | 3,426 | 12,137 | 3,825 |
| Periwinkle and cockle | 850 | | | 75 | | | 87 | |
| Harpoons, swordfish | 20 | 8 | 5 | 53 | 3 | | | 18 |
| Spears | 66 | 51 | 1 | 15 | | | 68 | |
| Dredges— | | | | | | | | |
| Clam | 41 | 17 | 3 | | 17 | | | |
| Yards at mouth | 20 | 9 | 1 | | 10 | | | |
| Oyster | 20 | 4 | | | | | 2 | |
| Yards at mouth | 21 | 3 | | | | | 3 | |
| Scallop | 729 | 465 | 542 | | 406 | | 734 | 1 |
| Yards at mouth | 574 | 419 | 452 | | 277 | | 613 | 2 |
| Tongs | 64 | 70 | | | | | 49 | |
| Rakes | 295 | 46 | 87 | | 48 | | 76 | |
| Forks | 41 | 9 | 1 | 275 | | 75 | 12 | 125 |
| Hoes | 140 | | | 338 | | | 117 | 15 |

CATCH: BY COUNTIES

| Species | Barnstable | | Bristol | | Dukes | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 361,808 | $3,206 | 6,848 | $116 | 785,940 | $7,692 | 197,250 | $2,461 |
| Bluefish | 112,728 | 11,698 | 7,235 | 440 | 19,309 | 2,387 | 67,935 | 5,558 |
| Bonito | 60,581 | 4,792 | 500 | 40 | 7,236 | 559 | | |
| Butterfish | 448,980 | 36,329 | 22,536 | 1,876 | 82,118 | 6,940 | 156,589 | 13,490 |
| Carp | 2,976 | 59 | | | | | | |
| Catfish and bullheads | 29,700 | 596 | 2,700 | 54 | | | 37,725 | 1,092 |
| Cod | 4,193,539 | 152,026 | 3,020,401 | 77,974 | 265,205 | 7,447 | 25,761,505 | 803,393 |
| Croaker | | | 140,005 | 5,600 | | | | |
| Cunner | | | 415 | 23 | | | | |
| Cusk | 95,644 | 1,811 | 1,634 | 28 | | | 2,119,156 | 47,230 |
| Eels | 144,650 | 16,588 | 30,207 | 3,321 | 72,500 | 7,536 | 88,268 | 2,316 |
| Flounders | 4,506,096 | 141,856 | 4,873,326 | 239,798 | 1,117,831 | 35,910 | 2,341,666 | 105,582 |
| Frigate mackerel | | | | | | | 20,150 | 888 |
| Goosefish | | | | | | | 200 | 3 |
| Grayfish | 38,096 | 811 | 1,200 | 15 | 40,000 | 2,000 | | |
| Haddock | 4,101,828 | 123,162 | 12,422,658 | 381,483 | 204,726 | 7,023 | 53,942,434 | 1,748,115 |
| Hake | 895,775 | 17,481 | 202,802 | 2,573 | 17,040 | 328 | 5,564,841 | 101,279 |
| Halibut | 6,765 | 1,033 | 46,597 | 7,225 | | | 1,892,731 | 286,736 |
| Herring, sea | 2,737,152 | 32,365 | 25,487 | 297 | | | 1,050,140 | 14,551 |
| King whiting or "kingfish" | 100 | 13 | | | | | | |
| Launce | 90,426 | 1,534 | | | | | 92,500 | 2,850 |
| Mackerel | 3,079,155 | 109,566 | 723,090 | 16,605 | 385,929 | 15,159 | 27,390,087 | 942,841 |
| Minnows | 6,000 | 1,200 | | | | | | |
| Pollock | 155,854 | 2,805 | 53,293 | 1,050 | 6,860 | 131 | 9,868,067 | 156,413 |
| Rosefish | | | 435 | 9 | | | 21,269 | 414 |
| Salmon | | | | | | | 30 | 9 |
| Scup or porgy | 56,503 | 2,912 | 476,360 | 23,305 | 134,795 | 4,346 | | |
| Sea bass | 2,750 | 300 | 96,215 | 6,851 | 1,622 | 176 | | |
| Sea robin | 100 | 1 | | | | | | |
| Shad | 21,778 | 1,674 | 89 | 6 | | | 30,399 | 1,167 |
| Sharks | 440 | 5 | 25,575 | 135 | | | 14,298 | 587 |
| Skates | | | 2,723 | 54 | | | 463 | 27 |
| Smelt | | | | | | | 4,100 | 2,465 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 1,238 | 149 | | | | |
| Spotted | 200 | 40 | | | 546 | 81 | | |
| Striped bass | 27,385 | 6,099 | | | | | | |
| Sturgeon | 350 | 96 | 740 | 142 | | | 700 | 67 |

*Fisheries of Massachusetts, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Barnstable | | Bristol | | Dukes | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Swordfish | 341,099 | $60,182 | 155,997 | $21,190 | 297,144 | $51,893 | 2,293,767 | $416,025 |
| Tautog | 16,203 | 950 | 59,337 | 3,500 | 21,570 | 1,300 | | |
| Tuna or "horse mackerel" | 64,296 | 4,961 | | | 650 | 65 | 1,120 | 197 |
| White perch | | | 450 | 45 | | | | |
| Whiting | 6,095,473 | 60,203 | 11,152 | 198 | 6,728 | 135 | 1,201,100 | 11,112 |
| Wolffish | 48,667 | 953 | 90,347 | 1,283 | | | 391,792 | 7,564 |
| Crabs, hard | | | | | | | 37,708 | 8,117 |
| Lobsters | 326,062 | 83,308 | 259,404 | 68,350 | 356,641 | 79,202 | 607,880 | 189,771 |
| Shrimp | 4,800 | 3,600 | | | | | | |
| Squid | 3,416,401 | 61,754 | 150,689 | 2,062 | 92,921 | 1,586 | 113,195 | 2,384 |
| Clams: | | | | | | | | |
| Cockle | 7,020 | 1,690 | | | | | | |
| Hard, public | 1,069,280 | 253,940 | 316,120 | 93,550 | 160,880 | 53,798 | | |
| Hard, private | 51,600 | 4,149 | | | | | | |
| Razor | 251,546 | 14,201 | | | | | | |
| Soft public | 121,760 | 25,653 | 3,600 | 900 | 1,000 | 225 | 1,955,692 | 158,171 |
| Surf or skimmer | | | 4,800 | 1,200 | 1,600 | 350 | 31,875 | 2,200 |
| Oysters: | | | | | | | | |
| Market, private, spring | 200,808 | 92,086 | | | | | | |
| Market, private, fall | 197,794 | 85,122 | 6,160 | 1,950 | | | | |
| Seed, private, spring | | | 77,000 | 5,500 | | | | |
| Seed, public, fall | 31,500 | 2,250 | | | | | | |
| Periwinkles | 9,324 | 2,383 | | | 2,700 | 300 | 2,160 | 480 |
| Scallops: | | | | | | | | |
| Bay | 600,274 | 167,335 | 149,670 | 43,637 | 386,586 | 107,385 | | |
| Sea | 47,940 | 8,734 | 462,420 | 68,320 | | | | |
| Total | 34,079,206 | 1,603,512 | 23,931,455 | 1,080,854 | 4,470,077 | 393,954 | 137,298,792 | 5,035,555 |

| Species | Nantucket | | Norfolk | | Plymouth | | Suffolk | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 22,500 | $225 | 397,500 | $3,750 | 18,000 | $180 |
| Bluefish | 2,500 | $625 | | | | | 600 | 44 |
| Bonito | 14,100 | 1,128 | | | | | | |
| Butterfish | 35,250 | 3,878 | | | | | 109,640 | 9,654 |
| Catfish and bullheads | | | | | | | 32,000 | 640 |
| Cod | 1,120,889 | 30,786 | 11,000 | 300 | 100,518 | 3,525 | 43,049,167 | 1,282,897 |
| Cunner | | | | | | | 18,320 | 551 |
| Cusk | | | | | | | 2,496,642 | 54,480 |
| Eels | 111,000 | 11,100 | | | 22,850 | 3,266 | 9,590 | 339 |
| Flounders | 3,480,355 | 164,051 | 2,600 | 156 | 7,000 | 420 | 15,006,035 | 574,865 |
| Frigate mackerel | | | | | | | 364,511 | 17,033 |
| Grayfish | 4,400 | 44 | | | | | 600 | 12 |
| Haddock | 1,421,989 | 29,567 | | | 28,600 | 780 | 130,565,554 | 4,151,119 |
| Hake | 418 | 8 | | | | | 12,559,693 | 290,389 |
| Halibut | 3,168 | 482 | | | | | 931,183 | 150,162 |
| Herring, sea | | | 17,500 | 200 | 836,500 | 6,274 | 4,020,270 | 59,780 |
| King whiting or "kingfish" | 100 | 8 | | | | | | |
| Mackerel | 37,600 | 2,632 | 9,000 | 360 | 104,750 | 3,139 | 13,801,665 | 479,356 |
| Pollock | 5,610 | 203 | 1,650 | 60 | | | 4,923,342 | 100,810 |
| Rosefish | | | | | | | 88,153 | 1,766 |
| Salmon | | | | | | | 25 | 1 |
| Scup or porgy | 4,350 | 435 | | | | | 120,000 | 4,800 |
| Sea bass | 1,000 | 250 | | | | | 40,000 | 1,800 |
| Shad | 200 | 16 | | | | | 1,683 | 78 |
| Sharks | 1,800 | 54 | | | | | 6,956 | 195 |
| Skates | | | | | | | 48,617 | 735 |
| Smelt | | | 2,100 | 252 | | | 50 | 2 |
| Squeteagues or "sea trout," spotted | 500 | 100 | | | | | | |
| Sturgeon | | | | | | | 5,955 | 710 |
| Swordfish | 115,568 | 15,503 | | | | | 524,758 | 92,800 |
| Tautog | | | | | 12,600 | 1,008 | | |
| Whiting | | | | | 381,950 | 3,374 | 205,885 | 6,697 |
| Wolffish | | | | | | | 1,990,185 | 42,170 |
| Crabs, hard | | | 12,290 | 2,290 | 12,500 | 1,660 | 395,800 | 74,213 |
| Lobsters | 45,368 | 11,689 | 129,287 | 39,423 | 528,591 | 134,159 | 85,001 | 20,044 |
| Squid | 21,000 | 420 | | | 35,800 | 716 | | |

*Fisheries of Massachusetts, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Nantucket | | Norfolk | | Plymouth | | Suffolk | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Clams: | | | | | | | | |
| Cockle | | | | | 17,550 | 3,025 | | |
| Hard, public | 285,424 | 59,360 | | | 58,000 | 16,362 | | |
| Hard, private | 14,400 | 3,000 | | | | | | |
| Razor | | | | | 128,720 | 6,275 | | |
| Soft, public | | | 54,000 | 5,085 | 143,600 | 15,150 | 994,000 | 70,750 |
| Mussels | | | | | | | 10,800 | 2,100 |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 770 | 200 | | |
| Market, private, spring | | | | | 21,367 | 8,325 | | |
| Market, private, fall | | | | | 7,615 | 2,967 | | |
| Seed, private, spring | | | | | 38,808 | 1,386 | | |
| Periwinkles | | | | | 3,258 | 724 | | |
| Scallops: | | | | | | | | |
| Bay | 106,194 | 29,898 | | | 192,420 | 48,310 | | |
| Sea | 378 | 68 | | | | | | |
| Irish moss | | | | | 93,000 | 5,580 | | |
| Total | 6,833,561 | 365,305 | 261,927 | 48,351 | 3,174,267 | 270,375 | 232,424,680 | 7,491,172 |

*Industries related to the fisheries of Massachusetts, 1930*

TRANSPORTING

| Item | Barnstable County | Suffolk County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 2 | 28 | 30 |
| Vessels, motor— | | | |
| 5 to 10 tons | 2 | 2 | 4 |
| 11 to 20 tons | | 5 | 5 |
| 21 to 30 tons | | 2 | 2 |
| 41 to 50 tons | | 1 | 1 |
| Total | 2 | 10 | 12 |
| Net tonnage | 12 | 187 | 199 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Barnstable County | Bristol County | Dukes, Middlesex, Nantucket, and Norfolk Counties | Essex County | Plymouth County | Suffolk County | Total |
|---|---|---|---|---|---|---|---|
| Establishments | 27 | 11 | 4 | 44 | 8 | 99 | 193 |
| Persons engaged: | | | | | | | |
| Proprietors | 11 | 7 | 2 | 28 | 7 | 22 | 77 |
| Salaried employees | 27 | 22 | 4 | 211 | 6 | 492 | 762 |
| Wage earners— | | | | | | | |
| Average for season | 227 | 58 | 32 | 1,172 | 24 | 1,221 | 2,734 |
| Average for year | 166 | 41 | 30 | 1,003 | 15 | 1,174 | 2,429 |
| Paid to salaried employees | $56,478 | $28,885 | $8,276 | $541,072 | $9,380 | $1,342,606 | $1,986,697 |
| Paid to wage earners | 196,895 | 53,137 | 38,730 | 1,123,654 | 21,817 | 1,771,893 | 3,206,126 |
| Total salaries and wages | 253,373 | 82,022 | 47,006 | 1,664,726 | 31,197 | 3,114,499 | 5,192,823 |

*Industries related to the fisheries of Massachusetts, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Cod: | | | |
| Fresh fillets | pounds | 3,732,070 | $538,878 |
| Frozen fillets | do | 1,291,480 | 165,447 |
| Salted | do | 6,659,091 | 552,300 |
| Smoked fillets | do | 567,217 | 80,085 |
| Oil, cod-liver | gallons | 101,980 | 81,195 |
| Cusk: | | | |
| Fresh fillets | pounds | 282,680 | 43,067 |
| Salted | do | 398,649 | 18,448 |
| Smoked fillets | do | 867,145 | 122,400 |
| Flounders: | | | |
| Fresh fillets | do | 1,210,243 | 233,664 |
| Frozen fillets | do | 309,110 | 53,073 |
| Haddock: | | | |
| Fresh fillets | do | 40,244,170 | 6,300,610 |
| Frozen fillets | do | 12,655,276 | 1,974,343 |
| Salted | do | 558,132 | 32,781 |
| Finnan haddie | do | 4,099,511 | 346,261 |
| Smoked fillets | do | 720,748 | 125,407 |
| Canned flakes | standard cases | 20,142 | 202,864 |
| Hake: | | | |
| Fresh fillets | pounds | 2,008,907 | 259,974 |
| Frozen fillets | do | 335,127 | 45,134 |
| Salted | do | 1,800,022 | 87,789 |
| Smoked fillets | do | 14,000 | 1,900 |
| Halibut, frozen fillets | do | 8,379 | 2,409 |
| Herring, sea: | | | |
| Smoked— | | | |
| Bloaters | do | 1,131,417 | 186,258 |
| Kippered | do | 179,467 | 40,041 |
| Mackerel: | | | |
| Fresh fillets | do | 139,012 | 27,798 |
| Salted fillets | do | 1,969,626 | 229,709 |
| Salted | do | 2,277,667 | 190,299 |
| Pollock: | | | |
| Fresh fillets | do | 272,714 | 35,648 |
| Frozen fillets | do | 3,030 | 394 |
| Salted | do | 2,957,113 | 162,591 |
| Wolffish: | | | |
| Fresh fillets | do | 19,812 | 3,719 |
| Frozen fillets | do | 37,410 | 5,241 |
| Crab meat, packaged (fresh-cooked) | do | 169,383 | 93,061 |
| Lobster meat, packaged (fresh-cooked) | do | 103,716 | 129,488 |
| Clams, soft, fresh-shucked | gallons | 10,125 | 16,325 |
| Oysters, fresh-shucked | do | 2,279 | 6,305 |
| Unclassified products: | | | |
| Fresh and frozen [1] | pounds | 484,671 | 52,184 |
| Salted [2] | do | 664,802 | 35,055 |
| Smoked [3] | do | 529,612 | 210,670 |
| Canned [4] | standard cases | 167,084 | 1,189,181 |
| Glue | gallons | 497,838 | 1,175,826 |
| Meal | tons | 11,224 | 722,997 |
| By-products [5] | | (6) | 88,601 |
| Total | | | 15,869,420 |

[1] Includes fresh halibut and whiting fillets; frozen cusk, mackerel, and salmon fillets; and whiting sticks.
[2] Includes salted alewives, herring, Bismarck herring, Scotch-cured herring, split mackerel, mackerel fillets, salmon, shad, and tongues and cheeks.
[3] Includes smoked alewives, butterfish, flounders, lake trout, mackerel, salmon, shad, and whitefish.
[4] Includes the following canned products: Cod cakes, cod balls, etc., mackerel, haddock chowder, creamed fish, finnan haddie, roe, dog food, and clam products.
[5] Includes isinglass, dry scrap, blackfish oil, tanner's oil, and buttons and novelties from imported marine shells.
[6] Data not available.

*Industries related to the fisheries of Massachusetts, 1930*—Continued

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 3,325]

| Item | Quantity | Value |
|---|---|---|
| Alewives: | | |
| Salted ... pounds | 120,000 | $6,200 |
| Smoked ... do | 16,500 | 963 |
| Pickled ... do | 303,800 | 7,974 |
| Cod, salted ... do | 1,118,785 | 54,340 |
| Cusk, salted ... do | 22,182 | 554 |
| Hake, salted ... do | 10,440 | 131 |
| Halibut, salted ... do | 5,220 | 649 |
| Mackerel, salted ... do | 68,230 | 2,856 |
| Pollock, salted ... do | 1,060 | 23 |
| Clams, soft, fresh-shucked ... gallons | 129,988 | 145,988 |
| Scallops: | | |
| Bay, fresh-shucked ... do | 159,000 | 395,000 |
| Sea, fresh-shucked ... do | 56,000 | 77,000 |
| Total | | 691,678 |

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 2,606 have been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## RHODE ISLAND

*Fisheries of Rhode Island, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | Lines | | Pound nets | Floating traps |
|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | Other | | Drift | Run-around | Hand | Trawl | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 24 | 16 | | 13 | | 69 | 20 | 6 | 130 |
| On boats and shore— | | | | | | | | | |
| Regular | | | 67 | 1 | 31 | 142 | 23 | 43 | 77 |
| Casual | | | | 1 | | 32 | | | |
| Total | 24 | 16 | 67 | 15 | 31 | 243 | 43 | 49 | 207 |
| Vessels: | | | | | | | | | |
| Steam— | | | | | | | | | |
| 5 to 10 tons | | | | | | | | | 1 |
| 11 to 20 tons | | | | | | | | | 3 |
| 41 to 50 tons | | 1 | | | | | | | 2 |
| Total | | 1 | | | | | | | 6 |
| Net tonnage | | 45 | | | | | | | 139 |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 1 | | | 3 | | 21 | 7 | 2 | 1 |
| 11 to 20 tons | 3 | | | 1 | | 3 | 1 | | 3 |
| 21 to 30 tons | | | | | | | | | 1 |
| Total | 4 | | | 4 | | 24 | 8 | 2 | 5 |
| Net tonnage | 44 | | | 35 | | 187 | 61 | 12 | 68 |
| Total vessels | 4 | 1 | | 4 | | 24 | 8 | 2 | 11 |
| Total net tonnage | 44 | 45 | | 35 | | 187 | 61 | 12 | 207 |
| Boats: | | | | | | | | | |
| Motor | | | 2 | 1 | 5 | 99 | 12 | 3 | 12 |
| Other | | | 50 | 1 | 14 | 55 | | 36 | 46 |
| Accessory boats | 6 | 2 | 12 | 2 | | 24 | 8 | 4 | 35 |
| Apparatus: | | | | | | | | | |
| Number | 4 | 1 | 27 | 161 | 12 | 432 | 1,193 | 62 | 62 |
| Length, yards | 560 | 320 | 3,110 | | | | | | |
| Square yards | | | | 59,040 | 24,100 | | | | |
| Hooks, baits, or snoods | | | | | | 587 | 56,550 | | |

*Fisheries of Rhode Island, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Fyke nets | Dip nets | Otter trawls | Box traps | Pots | | | Harpoons | Spears |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Eel | Lobster | Periwinkle | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | | 212 | | | 41 | | 92 | |
| On boats and shore— | | | | | | | | | |
| Regular | 12 | 14 | 31 | 5 | 34 | 308 | 14 | 38 | 35 |
| Casual | 1 | 3 | 1 | | 6 | 108 | 6 | | 2 |
| Total | 13 | 17 | 244 | 5 | 40 | 457 | 20 | 130 | 37 |
| Vessels: | | | | | | | | | |
| Steam— | | | | | | | | | |
| 5 to 10 tons | | | 1 | | | | | | |
| 11 to 20 tons | | | 3 | | | | | | |
| Total | | | 4 | | | | | | |
| Net tonnage | | | 45 | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | | 34 | | | 18 | | 25 | |
| 11 to 20 tons | | | 9 | | | 1 | | 5 | |
| 21 to 30 tons | | | 1 | | | | | | |
| Total | | | 44 | | | 19 | | 30 | |
| Net tonnage | | | 380 | | | 136 | | 249 | |
| Total vessels | | | 48 | | | 19 | | 30 | |
| Total net tonnage | | | 425 | | | 136 | | 249 | |
| Boats: | | | | | | | | | |
| Motor | 7 | 9 | 18 | 2 | 19 | 296 | 8 | 19 | 1 |
| Other | 6 | | | 2 | 17 | 42 | 8 | 18 | 11 |
| Accessory boats | | | | | | 18 | | 31 | |
| Apparatus: | | | | | | | | | |
| Number | 40 | 17 | 66 | 4 | 2,015 | 39,165 | 875 | 49 | 37 |
| Yards at mouth | | | 1,824 | | | | | | |

| Item | Dredges | | | Tongs | Rakes | Forks | Hoes | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | Clam | Oyster | Scallop | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 2 | 68 | | | | | | | 356 |
| On boats and shore— | | | | | | | | | |
| Regular | 10 | | 100 | 337 | 118 | 10 | 6 | 2 | 870 |
| Casual | 2 | | 81 | 187 | 38 | 3 | 4 | 2 | 403 |
| Total | 14 | 68 | 181 | 524 | 156 | 13 | 10 | 4 | 1,629 |
| Vessels: | | | | | | | | | |
| Steam— | | | | | | | | | |
| 5 to 10 tons | | | | | | | | | 1 |
| 11 to 20 tons | | | | | | | | | 3 |
| 21 to 30 tons | | 1 | | | | | | | 1 |
| 41 to 50 tons | | 1 | | | | | | | 3 |
| 51 to 60 tons | | 1 | | | | | | | 1 |
| Total | | 3 | | | | | | | 9 |
| Net tonnage | | 126 | | | | | | | 265 |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 1 | 2 | | | | | | | 50 |
| 11 to 20 tons | | 9 | | | | | | | 21 |
| 21 to 30 tons | | 1 | | | | | | | 2 |
| 51 to 60 tons | | 1 | | | | | | | 1 |
| Total | 1 | 13 | | | | | | | 74 |
| Net tonnage | 7 | 231 | | | | | | | 747 |
| Total vessels | 1 | 16 | | | | | | | 83 |
| Total net tonnage | 7 | 357 | | | | | | | 1,012 |
| Boats: | | | | | | | | | |
| Motor | 5 | | 106 | 180 | 50 | | 2 | 1 | 578 |
| Other | | | 2 | 428 | 109 | 13 | 8 | 1 | 673 |
| Accessory boats | | | | 34 | | | | | 160 |
| Apparatus: | | | | | | | | | |
| Number | 6 | 32 | 532 | 523 | 156 | 13 | 10 | | |
| Yards at mouth | 4 | 49 | 414 | | | | | | |

*Fisheries of Rhode Island, 1930*—Continued

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Other | | | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | | | 3,000 | $360 | 31,000 | $5,360 |
| Eels | | | | | 165,200 | $17,740 | | | | |
| Flounders | | | | | 20,000 | 1,000 | | | | |
| Mackerel | 182,500 | $4,750 | 86,100 | $1,507 | | | 132,000 | 2,320 | | |
| Menhaden | | | 114,800 | 861 | | | | | | |
| Smelt | | | | | 50,000 | 7,500 | | | | |
| Squeteague or "sea trout," gray | | | | | 10,680 | 1,200 | | | 5,000 | 750 |
| Striped bass | | | | | 32,000 | 5,760 | | | | |
| Suckers | | | | | 7,600 | 152 | | | | |
| Tomcod | | | | | 1,600 | 32 | | | | |
| White perch | | | | | 27,600 | 2,760 | | | | |
| Total | 182,500 | 4,750 | 200,900 | 2,368 | 314,680 | 36,144 | 135,000 | 2,680 | 36,000 | 6,110 |

| Species | Lines | | | | Pound nets | | Floating traps | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Trawl | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Albacore | | | | | | | 34,759 | $703 |
| Alewives | | | | | 173,400 | $1,589 | 12,650 | 104 |
| Bluefish | 10,000 | $750 | | | 41,000 | 2,217 | 158,295 | 20,829 |
| Bonito | | | | | | | 57,439 | 4,221 |
| Butterfish | | | | | 170,605 | 9,962 | 730,515 | 38,755 |
| Cod | 941,737 | 38,875 | 187,070 | $8,041 | 10,890 | 323 | 331,808 | 14,536 |
| Cunner | 16,000 | 320 | | | 1,300 | 26 | 5,300 | 200 |
| Eels | 44,780 | 3,944 | | | 103,100 | 8,385 | 21,812 | 1,139 |
| Flounders | 8,200 | 406 | 2,200 | 110 | 81,400 | 4,003 | 460,271 | 22,700 |
| Grayfish | | | | | | | 7,800 | 156 |
| Haddock | 25,025 | 834 | 756,680 | 25,486 | 6,750 | 200 | 9,383 | 281 |
| Hake | 15,600 | 444 | 6,000 | 175 | 2,400 | 42 | 9,260 | 283 |
| Herring, sea | | | | | 44,125 | 875 | 113,916 | 1,767 |
| Hickory shad | | | | | 200 | 10 | 3,849 | 75 |
| Mackerel | 15,800 | 763 | | | 104,400 | 5,198 | 890,771 | 37,118 |
| Menhaden | | | | | 16,800 | 168 | 560 | 10 |
| Mullet | | | | | 1,000 | 40 | 7,392 | 258 |
| Pollock | 104,960 | 751 | 5,500 | 100 | | | 64,466 | 1,644 |
| Scup | | | | | 253,840 | 12,673 | 1,371,750 | 62,601 |
| Sea bass | | | | | 155 | 13 | 35,579 | 2,148 |
| Sea robin | | | | | 87,450 | 1,085 | 101,978 | 1,230 |
| Shad | | | | | 347 | 67 | 676 | 112 |
| Sharks | | | | | 3,400 | 70 | 9,580 | 146 |
| Skates | 6,000 | 120 | | | | | 27,800 | 556 |
| Skipper or "billfish" | | | | | | | 6,068 | 1,248 |
| Smelt | | | | | 975 | 180 | | |
| Squeteague or "sea trout," gray | 12,100 | 1,224 | | | 68,540 | 8,028 | 44,825 | 4,214 |
| Striped bass | 475 | 95 | | | 3,580 | 568 | 23,762 | 4,447 |
| Sturgeon | | | | | | | 1,234 | 197 |
| Tautog | 144,125 | 7,238 | | | 88,900 | 4,339 | 62,610 | 2,865 |
| Tomcod | | | | | 21,000 | 270 | | |
| Tuna or "horse mackerel" | 14,000 | 1,020 | | | | | 10,180 | 881 |
| White perch | | | | | 3,900 | 458 | 200 | 20 |
| Whiting | | | | | 292,550 | 2,778 | 1,360,387 | 18,628 |
| Squid | | | | | 152,150 | 4,021 | 1,393,752 | 37,855 |
| Total | 1,358,802 | 56,784 | 958,350 | 33,912 | 1,734,157 | 67,587 | 7,370,627 | 281,927 |

*Fisheries of Rhode Island, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Fyke nets | | Dip nets | | Otter trawls | | Box traps | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Cod | | | | | 80, 547 | $3, 044 | | |
| Cunner | | | 65, 000 | $1, 950 | | | | |
| Eels | 14, 500 | $1, 450 | | | | | | |
| Flounders | 13, 000 | 580 | | | 4, 115, 500 | 118, 173 | | |
| Grayfish | | | | | 1, 100 | 11 | | |
| Haddock | | | | | 88, 490 | 3, 320 | | |
| Hake | | | | | 29, 600 | 780 | | |
| Herring, sea | | | | | | | 56, 670 | $425 |
| Scup | | | | | 20, 000 | 1, 000 | | |
| Sea robin | | | | | 4, 500 | 45 | | |
| Shad | | | | | | | 3, 280 | 522 |
| Skates | | | | | 646, 550 | 5, 841 | | |
| Swordfish | | | | | 3, 000 | 500 | | |
| Tautog | 14, 000 | 700 | | | | | | |
| White perch | | | | | | | 18, 000 | 1, 800 |
| Whiting | | | | | 264, 350 | 5, 036 | | |
| Scallops, bay | | | 811 | 276 | | | | |
| Total | 41, 500 | 2, 730 | 65, 811 | 2, 226 | 5, 253, 637 | 137, 750 | 77, 950 | 2, 747 |

| Species | Pots | | | | | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Eel | | Lobster | | Periwinkle | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | 114, 235 | $11, 122 | 5, 550 | $658 | | | | |
| Swordfish | | | | | | | 606, 899 | $89, 609 |
| Crabs, hard | | | 166, 562 | 5, 256 | | | | |
| Lobsters | | | 1, 353, 107 | 313, 550 | | | | |
| Periwinkles | | | 233, 460 | 25, 940 | 78, 750 | $8, 740 | | |
| Total | 114, 235 | 11, 122 | 1, 758, 679 | 345, 404 | 78, 750 | 8, 740 | 606, 899 | 89, 609 |

| Species | Spears | | Dredges | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Clam | | Oyster | | Scallop | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | 25, 975 | $2, 796 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | 20, 460 | $3, 345 | | | | |
| Hard, private | | | 56, 100 | 10, 200 | 62, 453 | $16, 605 | | |
| Oysters: | | | | | | | | |
| Market, private, spring | | | | | 1, 531, 592 | 339, 887 | | |
| Market, private, fall | | | | | 1, 832, 128 | 392, 709 | | |
| Seed, private, spring | | | | | 298, 500 | 40, 750 | | |
| Scallops, bay | | | | | | | 93, 499 | $40, 348 |
| Total | 25, 975 | 2, 796 | 76, 560 | 13, 545 | 3, 724, 673 | 789, 951 | 93, 499 | 40, 348 |

| Species | Tongs | | Rakes | | Forks | | Hoes | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | | | |
| Hard, public | 1, 329, 064 | $262, 906 | 275, 803 | $51, 423 | | | | | 1, 100 | $200 |
| Hard, private | 103, 895 | 20, 700 | | | | | | | | |
| Soft, public | | | | | 20, 700 | $4, 527 | 7, 740 | $1, 915 | | |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | 8, 944 | 2, 650 | | | | | | |
| Market, public, fall | | | 8, 944 | 2, 650 | | | | | 135 | 20 |
| Seed, public, spring | 6, 000 | 1, 000 | | | | | | | 23 | 2 |
| Seed, public, fall | | | | | | | | | 361 | 47 |
| Total | 1, 438, 959 | 284, 606 | 293, 691 | 56, 723 | 20, 700 | 4, 527 | 7, 740 | 1, 915 | 1, 619 | 269 |

*Fisheries of Rhode Island, 1930*—Continued

OPERATING UNITS: BY COUNTIES

| Item | Bristol | Kent | Newport | Providence | Washington |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 29 | 3 | 256 | 31 | 37 |
| On boats and shore— | | | | | |
| Regular | 78 | 235 | 320 | 72 | 165 |
| Casual | 63 | 120 | 118 | 44 | 58 |
| Total | 170 | 358 | 694 | 147 | 260 |
| Vessels: | | | | | |
| Steam— | | | | | |
| 5 to 10 tons | | | 1 | | |
| 11 to 20 tons | | | 3 | | |
| 21 to 30 tons | | | | 1 | |
| 41 to 50 tons | | | 2 | 1 | |
| 51 to 60 tons | | | | 1 | |
| Total | | | 6 | 3 | |
| Net tonnage | | | 139 | 126 | |
| Motor— | | | | | |
| 5 to 10 tons | 3 | | 40 | | 7 |
| 11 to 20 tons | 5 | 1 | 11 | 1 | 3 |
| 21 to 30 tons | 1 | | 1 | | |
| 51 to 60 tons | | | | 1 | |
| Total | 9 | 1 | 52 | 2 | 10 |
| Net tonnage | 126 | 11 | 447 | 75 | 88 |
| Total vessels | 9 | 1 | 58 | 5 | 10 |
| Total net tonnage | 126 | 11 | 586 | 201 | 88 |
| Boats: | | | | | |
| Motor | 34 | 178 | 238 | 23 | 105 |
| Other | 108 | 225 | 140 | 94 | 106 |
| Accessory boats | 7 | 1 | 109 | 31 | 12 |
| Apparatus: | | | | | |
| Purse seines— | | | | | |
| Mackerel | | | 3 | | 1 |
| Length, yards | | | 360 | | 200 |
| Other | | | 1 | | |
| Length, yards | | | 320 | | |
| Haul seines | | | 1 | 16 | 10 |
| Length, yards | | | 300 | 1,775 | 1,025 |
| Gill nets— | | | | | |
| Drift | | 2 | 159 | | |
| Square yards | | 2,400 | 57,240 | | |
| Runaround | | | 10 | | 2 |
| Square yards | | | 2,100 | | 22,000 |
| Lines— | | | | | |
| Hand | 8 | 5 | 307 | 12 | 100 |
| Hooks | 16 | 3 | 392 | 12 | 164 |
| Trawl | | | 1,113 | | 80 |
| Hooks | | | 52,550 | | 4,000 |
| Pound nets | | 1 | 43 | | 18 |
| Floating traps | | | 45 | | 17 |
| Fyke nets | | 35 | | | 5 |
| Dip nets | 3 | | 14 | | |
| Otter trawls | 1 | | 47 | | 18 |
| Yards at mouth | 30 | | 1,339 | | 455 |
| Box traps | 2 | | | 2 | |
| Pots— | | | | | |
| Eel | 245 | 390 | 345 | 225 | 810 |
| Lobster | 1,822 | 1,080 | 24,736 | 138 | 11,389 |
| Periwinkle or cockle | 225 | | 425 | | 225 |
| Harpoons, swordfish | | | 44 | | 5 |
| Spears | 1 | 7 | | 8 | 21 |
| Dredges— | | | | | |
| Clam | | 3 | 3 | | |
| Yards at mouth | | 1 | 3 | | |
| Oyster | 16 | 2 | | 10 | 4 |
| Yards at mouth | 24 | 3 | | 16 | 6 |
| Scallop | 69 | 319 | 24 | | 120 |
| Yards at mouth | 54 | 250 | 17 | | 93 |
| Tongs | 106 | 252 | 33 | 87 | 45 |
| Rakes | 5 | 72 | 48 | 1 | 30 |
| Forks | 5 | | | | 8 |
| Hoes | 4 | 1 | | 5 | |

*Fisheries of Rhode Island, 1930*—Continued

CATCH: BY COUNTIES

| Species | Bristol | | Kent | | Newport | | Providence | | Washington | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Albacore | | | | | 34,759 | $703 | | | | |
| Alewives | | | | | 66,050 | 493 | | | 120,000 | $1,200 |
| Bluefish | | | 3,000 | $360 | 173,745 | 22,950 | | | 66,550 | 6,206 |
| Bonito | | | | | 56,389 | 4,127 | | | 1,050 | 94 |
| Butterfish | | | | | 776,065 | 38,291 | | | 125,055 | 10,426 |
| Cod | 1,400 | $42 | | | 1,409,872 | 59,130 | | | 141,680 | 5,647 |
| Cunner | | | | | 71,600 | 2,176 | | | 16,000 | 320 |
| Eels | 16,400 | 1,352 | 50,550 | 5,146 | 114,962 | 9,716 | 229,590 | $23,894 | 83,650 | 7,126 |
| Flounders | 2,000 | 60 | 12,000 | 550 | 3,418,921 | 93,459 | | | 1,267,650 | 52,903 |
| Grayfish | | | | | 1,300 | 15 | | | 7,600 | 152 |
| Haddock | | | | | 877,028 | 29,826 | | | 9,300 | 295 |
| Hake | | | | | 33,260 | 944 | | | 29,600 | 780 |
| Herring, sea | 26,670 | 200 | 600 | 30 | 118,441 | 1,902 | 30,000 | 225 | 39,000 | 710 |
| Hickory shad | | | | | 4,049 | 85 | | | | |
| Mackerel | | | | | 1,272,571 | 45,958 | | | 139,000 | 5,698 |
| Menhaden | | | | | 121,160 | 929 | | | 11,000 | 110 |
| Mullet | | | | | 8,392 | 298 | | | | |
| Pollock | | | | | 68,046 | 1,569 | | | 106,880 | 926 |
| Scup | | | | | 1,346,590 | 61,663 | | | 299,000 | 14,610 |
| Sea bass | | | | | 35,734 | 2,161 | | | | |
| Sea robin | | | | | 70,928 | 885 | | | 123,000 | 1,476 |
| Shad | 1,800 | 288 | | | 673 | 127 | 1,480 | 234 | 350 | 52 |
| Sharks | | | | | 11,480 | 186 | | | 1,500 | 30 |
| Skates | | | | | 302,550 | 3,296 | | | 377,800 | 3,221 |
| Skipper or "billfish" | | | | | 6,068 | 1,248 | | | | |
| Smelt | | | | | 975 | 180 | | | 50,000 | 7,500 |
| Squeteague or "sea trout," gray | | | 820 | 99 | 49,745 | 4,665 | | | 90,580 | 10,652 |
| Striped bass | | | | | 21,342 | 4,028 | | | 38,475 | 6,842 |
| Sturgeon | | | | | 1,234 | 197 | | | | |
| Suckers | | | | | | | | | 7,600 | 152 |
| Swordfish | | | | | 545,099 | 80,929 | | | 64,800 | 9,180 |
| Tautog | 11,350 | 550 | 14,200 | 708 | 160,085 | 7,499 | | | 124,000 | 6,385 |
| Tomcod | | | | | 6,000 | 120 | | | 16,600 | 182 |
| Tuna or "horse-mackerel" | | | | | 24,180 | 1,901 | | | | |
| White perch | 10,000 | 1,000 | | | 6,100 | 678 | 8,000 | 800 | 25,600 | 2,560 |
| Whiting | | | | | 1,490,537 | 20,002 | | | 426,750 | 6,440 |
| Crabs, hard | 49,335 | 1,416 | | | 117,227 | 3,840 | | | | |
| Lobsters | 44,458 | 10,571 | 22,744 | 5,323 | 991,570 | 224,591 | 779 | 187 | 293,556 | 72,878 |
| Squid | | | | | 772,902 | 25,426 | | | 773,000 | 16,450 |
| Clams: | | | | | | | | | | |
| Hard, public | 182,765 | 33,430 | 1,013,639 | 201,416 | 126,533 | 18,935 | 176,440 | 35,555 | 127,050 | 28,538 |
| Hard, private | 126,528 | 28,255 | 56,100 | 10,200 | | | 39,820 | 9,050 | | |
| Soft, public | 6,540 | 1,227 | 600 | 200 | | | 6,300 | 1,575 | 15,000 | 3,440 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | | | | | 8,944 | 2,650 |
| Market, public, fall | 135 | 20 | | | | | | | 8,944 | 2,650 |
| Market, private, spring | 775,757 | 186,082 | 16,875 | 3,375 | | | 553,024 | 114,930 | 185,936 | 35,500 |
| Market, private, fall | 675,959 | 160,209 | 16,875 | 3,375 | | | 767,422 | 158,125 | 371,872 | 71,000 |
| Seed, public, spring | 6,000 | 1,000 | | | 23 | 2 | | | | |
| Seed, public, fall | 338 | 45 | | | 23 | 2 | | | | |
| Seed, private, spring | 298,500 | 40,750 | | | | | | | | |
| Periwinkles | 50,094 | 5,566 | | | 259,686 | 28,854 | | | 2,430 | 260 |
| Scallops, bay | 5,532 | 1,619 | 42,832 | 19,850 | 14,446 | 4,280 | | | 31,500 | 14,875 |
| Total | 2,291,561 | 473,682 | 1,250,835 | 250,632 | 14,988,340 | 808,266 | 1,812,855 | 344,575 | 5,628,302 | 410,115 |

*Industries related to the fisheries of Rhode Island, 1930*

TRANSPORTING

| Item | Bristol County | Kent County | Newport County | Washington County | Total |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 3 | 2 | 10 | 4 | 19 |
| Vessels, motor: | | | | | |
| 5 to 10 tons | 1 | 1 | 2 | 1 | 5 |
| 11 to 20 tons | | | 1 | | 1 |
| Total | 1 | 1 | 3 | 1 | 6 |
| Net tonnage | 7 | 7 | 34 | 7 | 55 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Bristol County | Kent County | Newport County | Providence County | Washington County | Total |
|---|---|---|---|---|---|---|
| Establishments | 8 | 8 | 6 | 9 | 3 | 34 |
| Persons engaged: | | | | | | |
| Proprietors | 6 | 9 | 6 | 7 | | 28 |
| Salaried employees | 14 | 3 | 13 | 21 | 7 | 58 |
| Wage earners— | | | | | | |
| Average for season | 81 | 25 | 12 | 160 | 50 | 328 |
| Average for year | 55 | 17 | 7 | 109 | 30 | 218 |
| Paid to salaried employees | $19,136 | $3,625 | $18,760 | $62,351 | $15,600 | $119,472 |
| Paid to wage earners | 58,052 | 26,918 | 8,000 | 124,476 | 35,410 | 252,856 |
| Total, salaries and wages | 77,188 | 30,543 | 26,760 | 186,827 | 51,010 | 372,328 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Marine-shell novelties | (1) | $49,454 |
| Oysters, fresh-shucked ... gallons | 345,310 | 873,659 |
| Miscellaneous [2] | (1) | 368,112 |
| Total | | 1,291,225 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 401]

| | | |
|---|---|---|
| Scallops, bay, fresh-shucked ... gallons | 8,839 | $37,331 |

[1] Data not available.
[2] Includes the value of oyster-shell products; fresh-shucked, hard and soft clams; and canned hard clam chowder.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 5 have also been included as fishermen, and among the total persons engaged in the preparation of fisherman's manufactured products, 170 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## CONNECTICUT

*Fisheries of Connecticut, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | Lines | |
|---|---|---|---|---|---|---|---|
| | Mackerel | Menhaden | | Anchor | Drift | Hand | Trawl |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 47 | 60 | | | | 21 | 57 |
| On boats and shore— | | | | | | | |
| Regular | 4 | | 16 | 4 | | 67 | 13 |
| Casual | | | 83 | 5 | 62 | | |
| Total | 51 | 60 | 99 | 9 | 62 | 88 | 70 |
| Vessels: | | | | | | | |
| Steam— | | | | | | | |
| 101 to 110 tons | | 1 | | | | | |
| 161 to 170 tons | | 1 | | | | | |
| Total | | 2 | | | | | |
| Net tonnage | | 268 | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | 2 | | | | | 2 | |
| 11 to 20 tons | 2 | | | | | | |
| 21 to 30 tons | 1 | | | | | | 1 |
| 41 to 50 tons | 1 | | | | | 1 | 1 |
| 51 to 60 tons | | | | | | | 1 |
| 61 to 70 tons | 1 | | | | | | 1 |
| Total | 7 | | | | | 3 | 4 |
| Net tonnage | 171 | | | | | 63 | 185 |
| Boats: | | | | | | | |
| Motor | 2 | | 6 | 6 | 26 | 50 | 7 |
| Other | 2 | | 29 | | 10 | 3 | |
| Accessory boats | 14 | 2 | | | | | 41 |
| Apparatus: | | | | | | | |
| Number | 9 | 2 | 28 | 32 | 230 | 288 | 1,726 |
| Length, yards | 1,620 | 720 | 2,710 | | | | |
| Square yards | | | | 5,370 | 22,770 | | |
| Hooks, baits, or snoods | | | | | | 297 | 84,380 |

| Item | Pound nets | Floating traps | Fyke nets | Otter trawls | Pots | | |
|---|---|---|---|---|---|---|---|
| | | | | | Crab | Eel | Lobster |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 527 | | 4 | 4 |
| On boats and shore— | | | | | | | |
| Regular | 12 | 5 | 7 | 98 | 4 | 31 | 180 |
| Casual | | | 6 | | | 1 | |
| Total | 12 | 5 | 13 | 625 | 4 | 36 | 184 |
| Vessels: | | | | | | | |
| Steam— | | | | | | | |
| 121 to 130 tons | | | | 2 | | | |
| 161 to 170 tons | | | | 3 | | | |
| 171 to 180 tons | | | | 1 | | | |
| 181 to 190 tons | | | | 1 | | | |
| 201 to 210 tons | | | | 11 | | | |
| 261 to 270 tons | | | | 1 | | | |
| Total | | | | 19 | | | |
| Net tonnage | | | | 3,675 | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | | | | 27 | | 1 | 2 |
| 11 to 20 tons | | | | 18 | | | |
| 21 to 30 tons | | | | 1 | | | |
| 31 to 40 tons | | | | 1 | | | |
| Total | | | | 47 | | 1 | 2 |
| Net tonnage | | | | 514 | | 10 | 12 |
| Total vessels | | | | 66 | | 1 | 2 |
| Total net tonnage | | | | 4,189 | | 10 | 12 |
| Boats: | | | | | | | |
| Motor | 8 | 4 | 1 | 57 | 2 | 5 | 160 |
| Other | 1 | | 11 | | | 25 | 6 |
| Apparatus: | | | | | | | |
| Number | 11 | 8 | 107 | 132 | 160 | 808 | 16,505 |
| Yards at mouth | | | | 3,274 | | | |

*Fisheries of Connecticut, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Harpoons | Spears | Dredges, oyster | Tongs | Rakes | Forks | Hoes | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 45 | | 304 | 2 | | | | 952 |
| On boats and shore— | | | | | | | | |
| Regular | 16 | 40 | 12 | 142 | 30 | 64 | 6 | 426 |
| Casual | | | | | | | | 152 |
| Total | 61 | 40 | 316 | 144 | 30 | 64 | 6 | 1,530 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 11 to 20 tons | | | 1 | | | | | 1 |
| 51 to 60 tons | | | 1 | | | | | 1 |
| 61 to 70 tons | | | 2 | | | | | 2 |
| 71 to 80 tons | | | 1 | | | | | 1 |
| 91 to 100 tons | | | 2 | | | | | 2 |
| 101 to 110 tons | | | 1 | | | | | 2 |
| 111 to 120 tons | | | 1 | | | | | 1 |
| 121 to 130 tons | | | | | | | | 2 |
| 131 to 140 tons | | | 1 | | | | | 1 |
| 161 to 170 tons | | | | | | | | 4 |
| 171 to 180 tons | | | | | | | | 1 |
| 181 to 190 tons | | | | | | | | 1 |
| 201 to 210 tons | | | | | | | | 11 |
| 261 to 270 tons | | | | | | | | 1 |
| 311 to 320 tons | | | 1 | | | | | 1 |
| 391 to 400 tons | | | 1 | | | | | 1 |
| Total | | | 12 | | | | | 33 |
| Net tonnage | | | 1,534 | | | | | 5,477 |
| Motor— | | | | | | | | |
| 5 to 10 tons | 5 | | 26 | 1 | | | | 54 |
| 11 to 20 tons | 3 | | 10 | | | | | 28 |
| 21 to 30 tons | 2 | | 7 | | | | | 9 |
| 31 to 40 tons | 1 | | 4 | | | | | 5 |
| 41 to 50 tons | | | 3 | | | | | 4 |
| 51 to 60 tons | | | | | | | | 1 |
| 61 to 70 tons | | | | | | | | 1 |
| Total | 11 | | 50 | 1 | | | | 102 |
| Net tonnage | 153 | | 781 | 6 | | | | 1,490 |
| Sail— | | | | | | | | |
| 5 to 10 tons | | | 2 | | | | | 2 |
| 11 to 20 tons | | | 1 | | | | | 1 |
| Total | | | 3 | | | | | 3 |
| Net tonnage | | | 25 | | | | | 25 |
| Total vessels | 11 | | 65 | 1 | | | | 138 |
| Total net tonnage | 153 | | 2,340 | 6 | | | | 6,992 |
| Boats: | | | | | | | | |
| Motor | 8 | 2 | 8 | 8 | | 8 | | 237 |
| Other | | 28 | | 106 | 21 | 43 | 6 | 218 |
| Accessory boats | 11 | | | | | | | 62 |
| Apparatus: | | | | | | | | |
| Number | 19 | 40 | 242 | 144 | 30 | 64 | 6 | |
| Yards at mouth | | | 241 | | | | | |

*Fisheries of Connecticut, 1930*—Continued

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mackerel | | Menhaden | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 20,974 | $2,933 | | | | | 700 | $76 | | |
| Bonito | 116 | 13 | | | | | | | | |
| Butterfish | 2,000 | 200 | | | | | 200 | 20 | | |
| Carp | | | | | 13,060 | $1,356 | 3,500 | 420 | | |
| Croaker | 10,780 | 434 | | | | | | | | |
| Mackerel | 606,070 | 23,636 | | | | | | | | |
| Menhaden | | | 1,569,800 | $15,698 | | | | | | |
| Minnows | | | | | 29,035 | 2,672 | | | | |
| Mummichog | | | | | 7,134 | 713 | | | | |
| Scup | 283,452 | 5,567 | | | | | | | | |
| Shad | | | | | 21,722 | 3,523 | 2,250 | 446 | 29,970 | $6,126 |
| Smelt | | | | | 7,900 | 1,823 | | | | |
| Squeteague or "sea trout," gray | 23,754 | 659 | | | | | 1,500 | 275 | | |
| Striped bass | | | | | | | 500 | 50 | | |
| Suckers | | | | | 29,260 | 2,181 | | | | |
| Whiting | 2,500 | 10 | | | | | | | | |
| Total | 949,646 | 33,452 | 1,569,800 | 15,698 | 108,111 | 12,268 | 8,650 | 1,287 | 29,970 | 6,126 |

| Species | Lines | | | | Pound nets | | Floating traps | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hand | | Trawl | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 1,000 | $30 | | |
| Bluefish | 221,066 | $28,307 | | | 8,711 | $1,339 | 200 | 15 | | |
| Butterfish | | | | | 6,738 | 897 | 3,100 | 341 | | |
| Carp | | | | | | | | | 1,435 | $170 |
| Cod | | | 86,400 | $2,592 | | | | | | |
| Dolphin | | | 138 | 8 | | | | | | |
| Eels | | | 22,250 | 2,269 | 7,458 | 1,119 | | | 4,150 | 790 |
| Flounders | | | | | 11,036 | 594 | 7,100 | 426 | | |
| Haddock | | | 46,550 | 1,862 | | | | | | |
| Hake | | | 11,807 | 283 | | | | | | |
| Halibut | | | 7,755 | 1,132 | | | | | | |
| Mackerel | | | | | 3,912 | 521 | | | | |
| Menhaden | | | | | 3,000 | 30 | 860 | 34 | 2,000 | 100 |
| Minnows | | | | | | | | | 1,000 | 50 |
| Pike or pickerel | | | | | | | | | 275 | 41 |
| Pollock | 2,000 | 80 | | | | | | | | |
| Scup | | | | | 2,000 | 130 | | | | |
| Sea bass | 13,833 | 2,075 | 400 | 24 | 20 | 4 | | | | |
| Sea robin | | | | | 500 | 3 | | | | |
| Skates | | | 3,065 | 41 | 2,000 | 20 | | | | |
| Smelt | | | | | | | 2,000 | 300 | | |
| Squeteague or "sea trout," gray | 804 | 120 | | | 4,994 | 938 | 12,200 | 1,830 | | |
| Striped bass | | | | | 138 | 35 | 1,000 | 100 | | |
| Suckers | | | | | | | | | 39,760 | 3,082 |
| Swordfish | | | 1,619 | 244 | | | | | | |
| Tautog | 128,324 | 9,573 | | | 3,021 | 178 | 4,200 | 336 | | |
| Tilefish | | | 1,783,456 | 97,068 | | | | | | |
| Yellow perch | | | | | | | | | 700 | 105 |
| Squid | | | | | 10,700 | 225 | | | | |
| Total | 366,027 | 40,155 | 1,963,440 | 105,523 | 64,228 | 6,033 | 31,660 | 3,412 | 49,320 | 4,338 |

*Fisheries of Connecticut, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Otter trawls | | Pots | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Eel | | Lobster | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Butterfish | 24,141 | $2,315 | | | | | | |
| Cod | 8,828,829 | 256,577 | | | | | | |
| Cusk | 65,241 | 960 | | | | | | |
| Eels | 4,733 | 299 | | | 64,884 | $9,651 | | |
| Flounders | 11,146,070 | 363,458 | | | | | | |
| Haddock | 48,026,124 | 1,670,757 | | | | | | |
| Hake | 1,125,895 | 24,929 | | | | | | |
| Halibut | 175,155 | 32,340 | | | | | | |
| Mackerel | 5,644 | 209 | | | | | | |
| Pollock | 543,366 | 12,439 | | | | | | |
| Rosefish | 3,528 | 25 | | | | | | |
| Sea robin | 40,556 | 204 | | | | | | |
| Skates | 278,768 | 2,291 | | | | | | |
| Swordfish | 1,875 | 225 | | | | | | |
| Tomcod | | | | | 200 | 60 | | |
| Wolffish | 36,856 | 501 | | | | | | |
| Crabs, hard | 1,188 | 9 | 202,340 | $4,047 | | | | |
| Lobsters | 1,201 | 313 | | | | | 733,511 | $229,953 |
| Total | 70,309,170 | 2,367,851 | 202,340 | 4,047 | 65,084 | 9,711 | 733,511 | 229,953 |

| Species | Harpoons | | Spears | | Dredges, oyster | | Tongs | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | | | 35,254 | $3,879 | | | | |
| Swordfish | 220,802 | $35,199 | | | | | | |
| Tuna or "horse mackerel" | 5,400 | 324 | | | | | | |
| Clams, hard, public | | | | | | | 13,940 | $7,020 |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | | | 5,135 | 1,745 |
| Market, public, fall | | | | | | | 21,741 | 3,825 |
| Market, private, spring | | | | | 3,032,230 | $423,439 | | |
| Market, private, fall | | | | | 2,543,110 | 386,450 | 13,495 | 3,075 |
| Seed, public, spring | | | | | 301,805 | 41,405 | 203,000 | 29,000 |
| Seed, public, fall | | | | | 452,886 | 50,875 | 315,700 | 37,225 |
| Seed, private, spring | | | | | 3,709,741 | 556,963 | | |
| Seed, private, fall | | | | | 561,176 | 77,542 | | |
| Total | 226,202 | 35,523 | 35,254 | 3,879 | 10,600,948 | 1,536,674 | 573,011 | 81,890 |

| Species | Rakes | | Forks | | Hoes | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | |
| Hard, public | 800 | $400 | 1,888 | $764 | 800 | $400 |
| Soft, public | 27,150 | 5,430 | 37,905 | 6,224 | 6,675 | 1,335 |
| Oysters: | | | | | | |
| Seed, public, spring | 14,000 | 2,000 | | | | |
| Seed, public, fall | 36,820 | 4,208 | | | | |
| Total | 78,770 | 12,038 | 39,793 | 6,988 | 7,475 | 1,735 |

OPERATING UNITS: BY COUNTIES

| Item | Fairfield | Hartford | Middlesex | New Haven | New London |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | |
| On vessels | 187 | | | 188 | 577 |
| On boats and shore— | | | | | |
| Regular | 126 | | 50 | 69 | 181 |
| Casual | 15 | 57 | 61 | | 19 |
| Total | 328 | 57 | 111 | 257 | 777 |

*Fisheries of Connecticut, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Fairfield | Hartford | Middlesex | New Haven | New London |
|---|---|---|---|---|---|
| Vessels: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Steam— | | | | | |
| 11 to 20 tons | 1 | | | | |
| 51 to 60 tons | 1 | | | | |
| 61 to 70 tons | 1 | | | 1 | |
| 71 to 80 tons | 1 | | | | |
| 91 to 100 tons | 1 | | | 1 | |
| 101 to 110 tons | | | | 1 | 1 |
| 111 to 120 tons | 1 | | | | |
| 121 to 130 tons | | | | | 2 |
| 131 to 140 tons | 1 | | | | |
| 161 to 170 tons | | | | | 4 |
| 171 to 180 tons | | | | | 1 |
| 181 to 190 tons | | | | | 1 |
| 201 to 210 tons | | | | 1 | 10 |
| 261 to 270 tons | | | | 1 | |
| 311 to 320 tons | | | | 1 | |
| 391 to 400 tons | | | | 1 | |
| Total | 7 | | | 7 | 19 |
| Net tonnage | 550 | | | 1,455 | 3,466 |
| Motor— | | | | | |
| 5 to 10 tons | 25 | | | 10 | 19 |
| 11 to 20 tons | 5 | | | 7 | 16 |
| 21 to 30 tons | 3 | | | 4 | 2 |
| 31 to 40 tons | 2 | | | 2 | 1 |
| 41 to 50 tons | 3 | | | | 1 |
| 51 to 60 tons | | | | | 1 |
| 61 to 70 tons | | | | | 1 |
| Total | 38 | | | 23 | 41 |
| Net tonnage | 531 | | | 348 | 611 |
| Sail— | | | | | |
| 5 to 10 tons | 2 | | | | |
| 11 to 20 tons | 1 | | | | |
| Total | 3 | | | | |
| Net tonnage | 25 | | | | |
| Total vessels | 48 | | | 30 | 60 |
| Total net tonnage | 1,112 | | | 1,803 | 4,077 |
| Boats: | | | | | |
| Motor | 29 | 4 | 44 | 41 | 119 |
| Other | 84 | 17 | 33 | 31 | 53 |
| Accessory boats | 1 | | | | 61 |
| Apparatus: | | | | | |
| Purse seines— | | | | | |
| Mackerel | | | | | 9 |
| Length, yards | | | | | 1,620 |
| Menhaden | | | | | 2 |
| Length, yards | | | | | 720 |
| Haul seines | 3 | 10 | 8 | 4 | 3 |
| Length, yards | 250 | 1,200 | 850 | 180 | 230 |
| Gill nets— | | | | | |
| Anchor | | | 30 | | 2 |
| Square yards | | | 2,970 | | 2,400 |
| Drift | | 6 | 180 | | 44 |
| Square yards | | 594 | 17,820 | | 4,356 |
| Lines— | | | | | |
| Hand | 22 | | 73 | 20 | 173 |
| Hooks | 30 | | 74 | 20 | 173 |
| Trawl | | | | | 1,726 |
| Hooks | | | | | 84,380 |
| Pound nets | | | | 1 | 10 |
| Floating traps | | | | | 8 |
| Fyke nets | | 56 | 16 | 12 | 23 |
| Otter trawls | 11 | | 11 | 19 | 91 |
| Yards at mouth | 230 | | 220 | 410 | 2,414 |
| Pots— | | | | | |
| Crab | | | | | 160 |
| Eel | 141 | | 40 | 262 | 365 |
| Lobster | 2,565 | | 1,485 | 3,640 | 8,815 |
| Harpoons, swordfish | 1 | | 1 | | 17 |
| Spears | 12 | | | 5 | 23 |
| Dredges, oyster | 185 | | | 57 | |
| Yards at mouth | 166 | | | 75 | |
| Tongs | 81 | | 19 | 19 | 25 |
| Rakes | 18 | | | 12 | |
| Forks | 3 | | 4 | 9 | 48 |
| Hoes | | | | 6 | |

*Fisheries of Connecticut, 1930*—Continued

CATCH: BY COUNTIES

| Species | Fairfield | | Hartford | | Middlesex | | New Haven | | New London | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | | | | | | | 1,000 | $30 |
| Bluefish | 890 | $178 | | | 40,841 | $6,126 | 4,329 | $880 | 205,600 | 25,486 |
| Bonito | | | | | | | | | 116 | 13 |
| Butterfish | | | | | | | 6,420 | 715 | 29,759 | 3,058 |
| Carp | | | 4,660 | $466 | 12,000 | 1,320 | | | 1,335 | 160 |
| Cod | 5,000 | 350 | | | | | 381,125 | 11,363 | 8,529,104 | 247,450 |
| Croaker | | | | | | | | | 10,780 | 434 |
| Cusk | | | | | | | 4,011 | 123 | 61,230 | 837 |
| Dolphin | | | | | | | | | 138 | 8 |
| Eels | 27,100 | 3,055 | 2,100 | 315 | 6,500 | 1,100 | 25,229 | 3,822 | 77,800 | 9,715 |
| Flounders | 343,600 | 17,181 | | | 173,355 | 8,963 | 752,070 | 31,936 | 9,895,181 | 396,498 |
| Haddock | | | | | | | 4,660,167 | 155,981 | 43,412,507 | 1,516,638 |
| Hake | | | | | | | 79,581 | 2,696 | 1,058,121 | 22,516 |
| Halibut | | | | | | | 9,588 | 2,034 | 173,322 | 31,438 |
| Mackerel | | | | | | | 205 | 15 | 615,421 | 24,351 |
| Menhaden | | | | | | | 2,000 | 100 | 1,573,660 | 15,762 |
| Minnows | | | | | 25,000 | 2,000 | 3,750 | 665 | 1,285 | 57 |
| Mummichog | | | | | 2,134 | 213 | 5,000 | 500 | | |
| Pike or pickerel | | | | | | | | | 275 | 41 |
| Pollock | | | | | 2,000 | 80 | 88,689 | 1,965 | 454,677 | 10,474 |
| Rosefish | | | | | | | 3,528 | 25 | | |
| Scup | | | | | | | | | 285,452 | 5,697 |
| Sea bass | 13,333 | 2,000 | | | | | 520 | 79 | 400 | 24 |
| Sea robin | | | | | | | | | 41,056 | 207 |
| Shad | | | 19,590 | 3,188 | 28,141 | 5,600 | | | 6,211 | 1,307 |
| Skates | 15,804 | 216 | | | | | 58,430 | 794 | 209,599 | 1,342 |
| Smelt | 5,500 | 1,375 | | | | | | | 4,400 | 748 |
| Squeteague or "sea trout," gray | | | | | 804 | 120 | 300 | 60 | 42,148 | 3,642 |
| Striped bass | | | | | | | | | 1,038 | 185 |
| Suckers | | | 26,140 | 2,090 | 36,500 | 2,790 | | | 6,380 | 383 |
| Swordfish | 18,667 | 2,800 | | | 1,500 | 225 | 1,875 | 225 | 202,254 | 32,418 |
| Tautog | 17,084 | 1,492 | | | 17,540 | 1,161 | 6,621 | 529 | 94,300 | 6,905 |
| Tilefish | | | | | | | | | 1,783,456 | 97,068 |
| Tomcod | 200 | 60 | | | | | | | | |
| Tuna or "horse mackerel" | | | | | | | | | 5,400 | 324 |
| Whiting | | | | | | | | | 2,500 | 10 |
| Wolffish | | | | | | | 5,356 | 78 | 31,500 | 423 |
| Yellow perch | | | | | | | | | 700 | 105 |
| Crabs, hard | | | | | | | | | 203,528 | 4,056 |
| Lobsters | 84,970 | 33,147 | | | 68,910 | 24,118 | 126,004 | 46,482 | 454,828 | 126,519 |
| Squid | | | | | | | | | 10,700 | 225 |
| Clams: | | | | | | | | | | |
| Hard, public | 6,460 | 3,280 | | | | | 9,528 | 4,764 | 1,440 | 540 |
| Soft, public | 6,000 | 1,200 | | | 1,725 | 345 | 36,525 | 7,305 | 27,480 | 4,139 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | | | | | 5,135 | 1,745 |
| Market, public, fall | | | | | 17,243 | 2,925 | 4,498 | 900 | | |
| Market, private, spring | 2,660,949 | 360,284 | | | | | 371,281 | 63,155 | | |
| Market, private, fall | 1,702,427 | 245,027 | | | 2,249 | 450 | 851,929 | 144,048 | | |
| Seed, public, spring | 508,305 | 70,905 | | | | | 10,500 | 1,500 | | |
| Seed, public, fall | 792,806 | 90,508 | | | | | 12,600 | 1,800 | | |
| Seed, private, spring | 2,278,283 | 308,977 | | | | | 1,431,458 | 247,986 | | |
| Seed, private, fall | 279,076 | 33,567 | | | | | 282,100 | 43,975 | | |
| Total | 8,766,454 | 1,175,602 | 52,490 | 6,059 | 436,442 | 57,536 | 9,235,208 | 776,400 | 69,521,816 | 2,502,984 |

*Industries related to the fisheries of Connecticut, 1930*

TRANSPORTING

| Item | Fairfield County | New Haven County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 45 | 27 | 72 |
| Vessels: | | | |
| Steam— | | | |
| 11 to 20 tons | | 1 | 1 |
| 61 to 70 tons | 1 | 1 | 2 |
| Total | 1 | 2 | 3 |
| Net tonnage | 65 | 85 | 150 |
| Motor— | | | |
| 5 to 10 tons | 5 | | 5 |
| 11 to 20 tons | 1 | 3 | 4 |
| 21 to 30 tons | 1 | | 1 |
| 31 to 40 tons | | 1 | 1 |
| 41 to 50 tons | 1 | | 1 |
| 111 to 120 tons | 1 | | 1 |
| Total | 9 | 4 | 13 |
| Net tonnage | 178 | 127 | 305 |
| Total vessels | 10 | 6 | 16 |
| Total net tonnage | 243 | 212 | 455 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Fairfield County | New London County | New Haven County | Tolland County | Total |
|---|---|---|---|---|---|
| Establishments | 7 | 9 | 11 | 6 | 33 |
| Persons engaged: | | | | | |
| Proprietors | 9 | 6 | 14 | 11 | 40 |
| Salaried employees | 7 | 30 | 10 | 6 | 53 |
| Wage earners— | | | | | |
| Average for season | 87 | 310 | 166 | 340 | 903 |
| Average for year | 54 | 291 | 75 | 274 | 694 |
| Paid to salaried employees | $42,908 | $105,636 | $68,926 | $38,121 | $255,591 |
| Paid to wage earners | 69,697 | 363,595 | 87,649 | 273,788 | 794,729 |
| Total salaries and wages | 112,605 | 469,231 | 156,575 | 311,909 | 1,050,320 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Marine-shell buttons ... gross | 1,315,173 | $980,651 |
| Oysters, fresh-shucked ... gallons | 226,297 | 563,674 |
| Miscellaneous [1] | (2) | 1,172,564 |
| Total | | 2,716,889 |

[1] Includes fresh haddock fillets; frozen cod, flounder, haddock, hake, halibut, pollock, and salmon fillets frozen whiting sticks; smoked haddock fillets; frozen scallops; menhaden products; oyster-shell products fish meal; and marine-shell novelties.

[2] Data not available.

NOTE.—Of the total number of persons employed on transporting craft, 3 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## VESSEL FISHERIES AT THE PRINCIPAL NEW ENGLAND PORTS [5]

### ECONOMIC ASPECT

The landings of fishery products at the three principal New England ports (Boston and Gloucester, Mass., and Portland, Me.), by vessels of 5 net tons and over, during 1931, amounted to 263,684,584 pounds as landed, valued at $9,249,257. This is a decrease of 25 per cent in the quantity of the catch as compared with 1930, and a decrease of 28 per cent in the value of the catch. Of the total landings, 99 per cent consisted of fresh fish and 1 per cent of salted fish. The landings at Boston accounted for the largest amount landed at the three ports in 1931, accounting for 219,945,003 pounds, valued at $7,906,494, or 84 per cent of the total quantity. This is a decrease of 23 per cent in amount and 27 per cent in value as compared with 1930. Landings at Gloucester in 1931 amounted to 24,849,803 pounds, valued at $775,823, or 9 per cent of the total quantity. This is a decrease of 48 per cent in amount and 42 per cent in value as compared with the previous year. Landings at Portland amounted to 18,889,778 pounds, valued at $566,940, or 7 per cent of the total landings. This is an increase of 4 per cent in the quantity and less than one-half of 1 per cent in the value as compared with 1930.

Among the landings of fresh fish, haddock outranked other species in volume landed, the amount of all sizes in 1931 being 132,845,465 pounds, or 51 per cent of the total fresh fish. This is 30 per cent less than the amount landed in 1930.

*Landings by fishing vessels at principal New England ports, 1931*

BOSTON: BY MONTHS

| Species | January | | February | | March | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 1,739,505 | $62,786 | 2,144,428 | $96,430 | 5,481,845 | $133,137 |
| Market | 1,805,664 | 49,367 | 1,339,248 | 44,478 | 1,872,055 | 46,948 |
| Scrod | 41,390 | 365 | 500 | 8 | 5,200 | 90 |
| Haddock, fresh: | | | | | | |
| Large | 9,433,050 | 442,167 | 12,381,077 | 497,861 | 14,994,510 | 544,977 |
| Scrod | 279,905 | 6,901 | 425,490 | 10,658 | 415,707 | 9,319 |
| Hake, fresh: | | | | | | |
| Large | 759,955 | 23,717 | 718,920 | 25,980 | 616,200 | 23,758 |
| Small | 1,500 | 68 | | | 4,220 | 118 |
| Pollock, fresh | 608,815 | 10,763 | 463,025 | 15,351 | 357,220 | 11,031 |
| Cusk, fresh | 582,070 | 13,191 | 439,020 | 11,707 | 544,765 | 11,892 |
| Halibut, fresh | 58,333 | 12,753 | 170,545 | 30,547 | 248,503 | 47,914 |
| Flounders, fresh | 934,110 | 60,980 | 861,988 | 53,976 | 903,553 | 49,948 |
| Other, fresh | 205,593 | 5,213 | 236,234 | 6,067 | 328,362 | 8,642 |
| Total, fresh | 16,449,890 | 688,271 | 19,180,475 | 793,063 | 25,772,140 | 887,774 |
| Landed in 1930: Fresh | 20,794,385 | 1,062,808 | 23,914,328 | 943,530 | 29,136,729 | 1,279,861 |

[5] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure," which gives in detail methods for collecting statistics, compilation practices and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

*Landings by fishing vessels at principal New England ports, 1931*—Continued

BOSTON: BY MONTHS—Continued

| Species | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | | | |
| Large | 2,587,710 | $58,305 | 1,630,677 | $47,205 | 1,805,215 | $60,170 | 1,804,608 | $55,159 |
| Market | 1,471,670 | 24,146 | 1,555,230 | 27,559 | 2,032,237 | 44,388 | 3,126,495 | 52,624 |
| Scrod | 10,700 | 113 | | | | | 8,200 | 43 |
| Cod, salted, large | | | 8,290 | 269 | | | | |
| Haddock, fresh: | | | | | | | | |
| Large | 12,892,170 | 243,846 | 9,979,125 | 226,675 | 9,058,320 | 271,685 | 7,959,060 | 222,832 |
| Scrod | 476,825 | 4,371 | 291,690 | 2,953 | 400,250 | 4,791 | 332,790 | 3,020 |
| Hake, fresh, large | 282,190 | 6,067 | 355,905 | 6,780 | 264,430 | 4,760 | 321,280 | 4,168 |
| Pollock, fresh | 228,865 | 5,114 | 303,805 | 3,490 | 276,167 | 4,785 | 221,080 | 3,835 |
| Cusk, fresh | 263,393 | 4,117 | 316,375 | 4,130 | 68,673 | 1,151 | 50,750 | 682 |
| Halibut, fresh | 338,592 | 55,251 | 395,042 | 48,943 | 287,106 | 39,876 | 313,963 | 36,055 |
| Mackerel, fresh | 57,300 | 9,454 | 1,920,390 | 120,101 | 3,468,495 | 147,474 | 4,362,842 | 181,711 |
| Flounders, fresh | 700,800 | 23,653 | 985,685 | 21,232 | 603,240 | 19,852 | 520,680 | 20,981 |
| Swordfish, fresh | | | | | 196,575 | 61,059 | 492,542 | 134,085 |
| Other, fresh | 296,783 | 4,059 | 294,693 | 5,394 | 215,287 | 4,491 | 136,117 | 5,243 |
| Total, fresh | 19,606,998 | 438,496 | 18,028,617 | 514,462 | 18,675,995 | 664,482 | 19,650,407 | 720,438 |
| Total, salted | | | 8,290 | 269 | | | | |
| Grand total | 19,606,998 | 438,496 | 18,036,907 | 514,731 | 18,675,995 | 664,482 | 19,650,407 | 720,438 |
| Landed in 1930: | | | | | | | | |
| Fresh | 27,700,507 | 782,318 | 23,578,286 | 635,507 | 24,210,764 | 932,343 | 30,404,936 | 1,055,986 |
| Salted | | | | | | | 42,700 | 1,835 |
| Total | 27,700,507 | 782,318 | 23,578,286 | 635,507 | 24,210,764 | 932,343 | 30,447,636 | 1,057,821 |

| Species | August | | September | | October | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 1,309,297 | $53,810 | 1,481,042 | $61,867 | 1,709,983 | $68,998 |
| Market | 3,059,870 | 61,873 | 2,808,421 | 77,700 | 2,776,355 | 84,956 |
| Scrod | 1,100 | 16 | 5,570 | 65 | 48,925 | 1,086 |
| Cod, salted, large | | | 4,400 | 171 | | |
| Haddock, fresh: | | | | | | |
| Large | 6,484,560 | 263,706 | 6,918,270 | 299,075 | 6,074,825 | 314,627 |
| Scrod | 637,253 | 9,654 | 1,357,685 | 26,860 | 2,258,550 | 53,013 |
| Hake, fresh: | | | | | | |
| Large | 241,220 | 3,587 | 236,135 | 4,724 | 642,605 | 13,508 |
| Small | | | 2,000 | 40 | 5,900 | 97 |
| Pollock, fresh | 375,060 | 5,179 | 564,455 | 6,320 | 697,485 | 7,894 |
| Cusk, fresh | 102,270 | 1,375 | 181,765 | 3,055 | 208,445 | 4,522 |
| Halibut, fresh | 237,198 | 26,560 | 89,528 | 13,238 | 107,260 | 16,150 |
| Mackerel, fresh | 5,535,740 | 219,814 | 3,386,825 | 137,532 | 845,790 | 52,024 |
| Mackerel, salted | | | 3,000 | 120 | | |
| Flounders, fresh | 432,170 | 18,733 | 680,073 | 30,842 | 998,158 | 42,416 |
| Swordfish, fresh | 514,416 | 118,402 | 307,332 | 80,952 | 15,027 | 4,976 |
| Herring, fresh | 5,700 | 142 | | | | |
| Other, fresh | 118,368 | 4,634 | 65,517 | 3,255 | 109,801 | 6,049 |
| Total, fresh | 19,054,222 | 787,485 | 18,084,618 | 745,525 | 16,498,909 | 670,316 |
| Total, salted | | | 7,400 | 291 | | |
| Grand total | 19,054,222 | 787,485 | 18,092,018 | 745,816 | 16,498,909 | 670,316 |
| Landed in 1930: | | | | | | |
| Fresh | 24,726,124 | 938,855 | 29,723,655 | 929,812 | 20,135,688 | 937,819 |
| Salted | 2,000 | 80 | | | | |
| Total | 24,728,124 | 938,935 | 29,723,655 | 929,812 | 20,135,688 | 937,819 |

NOTE.—The weights of fresh and salted fish given in these statistics represent the fish as landed from the vessels, and the values are those received by the fishermen. Large cod are classified as those weighing over 10 pounds; market cod, 2½ to 10 pounds; and scrod cod, 1 to 2½ pounds. Large haddock are those weighing over 2½ pounds and scrod haddock, 1 to 2½ pounds. Large hake are those weighing over 6 pounds and small hake, under 6 pounds. Only landings by vessels having a capacity of 5 net tons or greater are used in this tabulation.

*Landings by fishing vessels at principal New England ports, 1931*—Continued

BOSTON: By months—Continued

| Species | November | | December | | Total, 1931 | | 1930 | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | | | |
| Large | 1,271,234 | $54,485 | 967,085 | $41,729 | 23,932,629 | $794,081 | 24,068,140 | $993,288 |
| Market | 2,367,975 | 63,279 | 1,515,380 | 42,741 | 25,730,600 | 620,059 | 28,211,846 | 690,620 |
| Scrod | 74,130 | 1,222 | 48,630 | 874 | 244,345 | 3,882 | 119,505 | 2,776 |
| Cod, salted, large | | | | | 12,690 | 440 | | |
| Haddock, fresh: | | | | | | | | |
| Large | 5,474,213 | 262,078 | 4,379,165 | 230,048 | 106,028,345 | 3,819,572 | 159,276,930 | 5,838,526 |
| Scrod | 3,804,210 | 66,178 | 3,578,040 | 63,892 | 14,258,395 | 261,610 | 7,821,344 | 156,169 |
| Hake, fresh: | | | | | | | | |
| Large | 959,845 | 14,719 | 462,230 | 11,034 | 5,860,915 | 142,802 | 12,614,249 | 336,873 |
| Small | 3,600 | 70 | 26,200 | 751 | 43,420 | 1,144 | 81,375 | 1,534 |
| Pollock, fresh | 601,580 | 5,334 | 330,430 | 4,621 | 5,027,987 | 83,717 | 4,671,009 | 106,912 |
| Cusk, fresh | 296,450 | 5,101 | 393,115 | 7,367 | 3,447,091 | 68,290 | 3,411,741 | 90,134 |
| Halibut, fresh | 32,815 | 7,591 | 30,941 | 6,856 | 2,309,826 | 341,734 | 2,510,353 | 432,238 |
| Mackerel, fresh | 202,752 | 13,253 | 74,918 | 8,270 | 19,855,052 | 889,633 | 23,637,679 | 870,821 |
| Mackerel, salted | | | | | 3,000 | 120 | 44,700 | 1,915 |
| Flounders, fresh | 1,128,105 | 38,336 | 744,925 | 39,256 | 9,493,487 | 420,205 | 13,095,404 | 596,412 |
| Swordfish, fresh | 450 | 155 | | | 1,526,342 | 399,629 | 3,078,274 | 666,922 |
| Herring, fresh | | | | | 5,700 | 142 | | |
| Other, fresh | 98,543 | 3,841 | 60,081 | 2,546 | 2,165,179 | 59,434 | 2,614,929 | 85,446 |
| Total, fresh | 16,315,902 | 535,637 | 12,611,140 | 459,985 | 219,929,313 | 7,905,934 | 285,212,778 | 10,868,671 |
| Total, salted | | | | | 15,690 | 560 | 44,700 | 1,915 |
| Grand total | 16,315,902 | 535,637 | 12,611,140 | 459,985 | 219,945,003 | 7,906,494 | 285,257,478 | 10,870,586 |
| Landed in 1930: | | | | | | | | |
| Fresh | 16,151,607 | 662,030 | 14,735,769 | 707,802 | | | 285,212,778 | 10,868,671 |
| Salted | | | | | | | 44,700 | 1,915 |
| Total | 16,151,607 | 662,030 | 14,735,769 | 707,802 | | | 285,257,478 | 10,870,586 |

GLOUCESTER: By months

| Species | January | | February | | March | | April | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | | | |
| Large | 154,356 | $8,197 | 119,875 | $7,585 | 929,775 | $22,732 | 771,155 | $17,743 |
| Market | 15,840 | 431 | 9,790 | 317 | 37,875 | 514 | 128,400 | 1,884 |
| Scrod | 3,855 | 42 | 1,955 | 28 | 140 | 2 | | |
| Cod, salted: | | | | | | | | |
| Large | | | | | | | 110,610 | 4,225 |
| Market | | | | | | | 6,479 | 191 |
| Haddock, fresh: | | | | | | | | |
| Large | 164,030 | 8,990 | 278,495 | 12,972 | 353,505 | 13,801 | 2,222,845 | 47,952 |
| Scrod | 3,695 | 78 | 7,760 | 131 | 5,760 | 107 | 19,200 | 312 |
| Hake, fresh, large | 71,395 | 1,838 | 52,910 | 1,729 | 15,008 | 358 | 11,640 | 135 |
| Hake, salted, large | | | | | | | 275 | 4 |
| Pollock, fresh | 329,905 | 6,305 | 21,055 | 800 | 4,275 | 58 | 15,740 | 124 |
| Pollock, salted | | | | | | | 117 | 2 |
| Cusk, fresh | 1,230 | 23 | 445 | 9 | 625 | 13 | 30,545 | 356 |
| Halibut, fresh | 35 | 4 | | | 18 | 3 | 4,695 | 704 |
| Flounders, fresh | 99,285 | 4,545 | 76,510 | 3,803 | 74,920 | 3,796 | 47,040 | 2,396 |
| Herring, salted | 1,441,368 | 51,915 | | | | | | |
| Other, fresh | 24,292 | 189 | 18,135 | 130 | 9,870 | 102 | 8,055 | 54 |
| Total, fresh | 867,918 | 30,642 | 586,930 | 27,504 | 1,431,771 | 41,486 | 3,259,315 | 71,660 |
| Total, salted | 1,441,368 | 51,915 | | | | | 117,481 | 4,422 |
| Grand total | 2,309,286 | 82,557 | 586,930 | 27,504 | 1,431,771 | 41,486 | 3,376,796 | 76,082 |
| Landed in 1930: | | | | | | | | |
| Fresh | 2,210,932 | 93,240 | 1,774,509 | 61,639 | 1,328,629 | 61,035 | 3,466,894 | 100,172 |
| Salted | 1,563,576 | 58,794 | | | | | 69,015 | 3,420 |
| Total | 3,774,508 | 152,034 | 1,774,509 | 61,639 | 1,328,629 | 61,035 | 3,535,909 | 103,592 |

*Landings by fishing vessels at principal New England ports, 1931*—Continued

GLOUCESTER: BY MONTHS—Continued

| Species | May | | June | | July | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 908,545 | $26,020 | 359,095 | $10,902 | 444,830 | $12,122 |
| Market | 222,546 | 2,945 | 73,290 | 1,116 | 216,635 | 3,223 |
| Scrod | 100 | 1 | 175 | 2 | 400 | 3 |
| Cod, salted: | | | | | | |
| Large | 246,590 | 8,627 | 118,455 | 4,110 | 107,650 | 3,722 |
| Market | 15,140 | 379 | 17,520 | 396 | 11,285 | 266 |
| Haddock, fresh: | | | | | | |
| Large | 650,720 | 14,016 | 224,335 | 6,569 | 430,420 | 9,222 |
| Scrod | 2,450 | 20 | 6,100 | 50 | 27,545 | 195 |
| Haddock, salted, large | 675 | 10 | | | | |
| Hake, fresh, large | 12,255 | 116 | 43,625 | 711 | 48,780 | 452 |
| Hake, salted, large | 245 | 5 | | | 1,145 | 17 |
| Pollock, fresh | 101,390 | 1,061 | 51,560 | 1,142 | 8,860 | 62 |
| Pollock, salted | 520 | 12 | 100 | 2 | 320 | 6 |
| Cusk, fresh | 9,305 | 97 | 19,450 | 224 | 26,095 | 294 |
| Cusk, salted | 190 | 4 | 1,615 | 31 | 2,180 | 42 |
| Halibut, fresh | | | 2,375 | 351 | 47,789 | 4,517 |
| Halibut, salted | | | | | 145 | 20 |
| Mackerel, fresh | 240,145 | 8,086 | 296,965 | 11,562 | 548,090 | 20,125 |
| Mackerel, salted | | | 10,470 | 524 | | |
| Flounders, fresh | 1,595 | 78 | 27,750 | 807 | 38,140 | 1,312 |
| Swordfish, fresh | | | 1,980 | 687 | 4,593 | 1,210 |
| Other, fresh | 445 | 9 | 2,450 | 40 | 2,685 | 80 |
| Total, fresh | 2,149,496 | 52,449 | 1,109,150 | 34,163 | 1,844,862 | 52,817 |
| Total, salted | 263,360 | 9,037 | 148,160 | 5,063 | 122,725 | 4,073 |
| Grand total | 2,412,856 | 61,486 | 1,257,310 | 39,226 | 1,967,587 | 56,890 |
| Landed in 1930: | | | | | | |
| Fresh | 4,892,302 | 111,667 | 2,670,552 | 77,462 | 7,728,185 | 153,481 |
| Salted | 279,715 | 13,380 | 178,142 | 8,677 | 175,055 | 8,358 |
| Total | 5,172,017 | 125,047 | 2,848,694 | 86,139 | 7,903,240 | 161,839 |

| Species | August | | September | | October | | November | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | | | |
| Large | 87,295 | $1,912 | 258,473 | $10,292 | 397,025 | $21,774 | 120,633 | $5,403 |
| Market | 86,560 | 1,320 | 44,220 | 872 | 12,735 | 331 | 46,971 | 1,202 |
| Scrod | 175 | 2 | | | 2,485 | 48 | 990 | 29 |
| Cod, salted: | | | | | | | | |
| Large | 346,077 | 12,097 | 61,530 | 2,153 | 37,920 | 1,328 | | |
| Market | 147,853 | 3,697 | 2,175 | 55 | 1,080 | 31 | | |
| Scrod | 5,645 | 85 | | | | | | |
| Haddock, fresh: | | | | | | | | |
| Large | 252,630 | 9,393 | 215,120 | 8,064 | 23,660 | 1,289 | 12,808 | 783 |
| Scrod | 37,780 | 362 | 89,885 | 1,124 | 2,330 | 52 | 20 | 1 |
| Haddock, salted, large | 135 | 2 | | | | | | |
| Hake, fresh: | | | | | | | | |
| Large | 21,000 | 179 | 99,880 | 1,983 | 97,462 | 1,890 | 95,940 | 1,492 |
| Small | | | | | 2,235 | 28 | 1,130 | 12 |
| Hake, salted, large | 1,200 | 12 | | | | | | |
| Pollock, fresh | 9,575 | 63 | 56,430 | 719 | 288,407 | 3,336 | 461,951 | 4,590 |
| Pollock, salted | 105 | 1 | 100 | 1 | | | | |
| Cusk, fresh | 27,910 | 325 | 13,325 | 161 | 5,525 | 80 | 5,525 | 79 |
| Cusk, salted | 765 | 15 | | | 55 | 1 | | |
| Halibut, fresh | | | | | 450 | 36 | 70 | 11 |
| Halibut, salted | | | | | 100 | 10 | | |
| Mackerel, fresh | 2,886,995 | 85,842 | 1,981,742 | 67,089 | 318,899 | 18,434 | 863,627 | 45,025 |
| Mackerel, salted | 36,159 | 1,447 | 5,700 | 239 | | | | |
| Flounders, fresh | 39,560 | 1,512 | 12,645 | 624 | 11,850 | 469 | 5,435 | 200 |
| Swordfish, fresh | | | 4,047 | 793 | | | | |
| Herring, fresh | | | | | 79,700 | 684 | | |
| Other, fresh | 2,790 | 111 | 220,500 | 2,559 | 33,727 | 1,215 | 122,736 | 5,278 |
| Total, fresh | 3,452,270 | 101,021 | 2,996,267 | 94,280 | 1,274,255 | 49,638 | 1,737,836 | 64,105 |
| Total, salted | 537,939 | 17,356 | 69,505 | 2,448 | 41,390 | 1,398 | | |
| Grand total | 3,990,209 | 118,377 | 3,065,772 | 96,728 | 1,315,645 | 51,036 | 1,737,836 | 64,105 |
| Landed in 1930: | | | | | | | | |
| Fresh | 3,414,305 | 87,790 | 6,099,035 | 145,377 | 2,326,872 | 83,902 | 6,222,155 | 155,392 |
| Salted | 307,693 | 14,832 | 779,080 | 42,792 | 344,683 | 17,839 | | |
| Total | 3,721,998 | 102,622 | 6,878,115 | 188,169 | 2,671,555 | 101,741 | 6,222,155 | 155,392 |

*Landings by fishing vessels at principal New England ports, 1931*—Continued

GLOUCESTER: BY MONTHS—Continued

| Species | December | | Total, 1931 | | 1930 | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 119,855 | $6,829 | 4,670,912 | $151,511 | 7,145,692 | $270,927 |
| Market | 2,395 | 60 | 897,257 | 14,215 | 2,262,190 | 46,763 |
| Scrod | 165 | 2 | 10,440 | 159 | 21,370 | 227 |
| Cod, salted: | | | | | | |
| Large | | | 1,028,832 | 36,262 | 1,335,845 | 71,853 |
| Market | | | 201,532 | 5,015 | 534,122 | 26,350 |
| Scrod | | | 5,645 | 85 | 201,454 | 8,704 |
| Haddock, fresh: | | | | | | |
| Large | 18,655 | 1,042 | 4,847,223 | 134,093 | 12,782,802 | 363,290 |
| Scrod | 5,225 | 53 | 207,750 | 2,485 | 673,713 | 9,321 |
| Haddock, salted, large | | | 810 | 12 | | |
| Hake, fresh: | | | | | | |
| Large | 26,480 | 597 | 596,375 | 11,480 | 1,613,113 | 29,252 |
| Small | | | 1,130 | 12 | 17,185 | 376 |
| Hake, salted, large | | | 5,100 | 66 | 4,230 | 79 |
| Pollock, fresh | 47,955 | 1,053 | 1,397,103 | 19,313 | 8,376,338 | 141,650 |
| Pollock, salted | | | 1,262 | 24 | 3,155 | 71 |
| Cusk, fresh | 1,010 | 13 | 140,990 | 1,674 | 375,015 | 5,937 |
| Cusk, salted | | | 4,805 | 93 | 18,052 | 438 |
| Halibut, fresh | 37 | 6 | 55,469 | 5,632 | 22,505 | 3,169 |
| Halibut, salted | | | 245 | 30 | 2,995 | 532 |
| Mackerel, fresh | 161,910 | 17,314 | 7,298,373 | 273,477 | 9,068,868 | 255,557 |
| Mackerel, salted | | | 52,329 | 2,210 | 33,530 | 1,271 |
| Flounders, fresh | 33,945 | 1,657 | 468,675 | 21,199 | 1,011,189 | 47,586 |
| Swordfish, fresh | | | 10,620 | 2,690 | 2,773 | 673 |
| Herring, fresh | 125,000 | 3,000 | 204,700 | 3,684 | 77,400 | 774 |
| Herring, salted | 845,508 | 28,674 | 2,286,876 | 80,589 | 1,563,576 | 58,794 |
| Other, fresh | 9,665 | 46 | 455,350 | 9,813 | 212,355 | 4,493 |
| Total, fresh | 552,297 | 31,672 | 21,262,367 | 651,437 | 43,662,508 | 1,179,995 |
| Total, salted | 845,508 | 28,674 | 3,587,436 | 124,386 | 3,696,959 | 168,092 |
| Grand total | 1,397,805 | 60,346 | 24,849,803 | 775,823 | 47,359,467 | 1,348,087 |
| Landed in 1930: | | | | | | |
| Fresh | 1,528,138 | 48,838 | | | 43,662,508 | 1,179,995 |
| Salted | | | | | 3,696,959 | 168,092 |
| Total | 1,528,138 | 48,838 | | | 47,359,467 | 1,348,087 |

PORTLAND: BY MONTHS

| Species | January | | February | | March | | April | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | | | |
| Large | 106,656 | $4,485 | 80,672 | $3,735 | 493,045 | $15,814 | 1,132,605 | $29,013 |
| Market | 50,156 | 1,242 | 37,211 | 1,169 | 78,022 | 1,811 | 83,380 | 1,495 |
| Scrod | 4,420 | 44 | 2,535 | 26 | 2,058 | 20 | 980 | 8 |
| Haddock, fresh: | | | | | | | | |
| Large | 311,374 | 17,257 | 263,177 | 12,596 | 973,882 | 26,120 | 4,569,238 | 105,417 |
| Scrod | 10,782 | 109 | 8,240 | 83 | 13,012 | 128 | 2,840 | 28 |
| Hake, fresh: | | | | | | | | |
| Large | 44,060 | 1,279 | 16,335 | 473 | 23,693 | 682 | 7,665 | 195 |
| Small | 101,352 | 2,762 | 59,745 | 1,895 | 41,667 | 1,089 | 35,725 | 704 |
| Pollock, fresh | 40,329 | 383 | 18,726 | 426 | 23,185 | 421 | 82,725 | 621 |
| Cusk, fresh | 92,081 | 2,213 | 77,847 | 2,187 | 119,255 | 2,630 | 109,670 | 1,725 |
| Halibut, fresh | 582 | 137 | 361 | 86 | 4,366 | 865 | 24,120 | 3,551 |
| Flounders, fresh | 27,792 | 857 | 30,190 | 1,390 | 33,778 | 908 | 49,362 | 775 |
| Other, fresh | 43,569 | 1,015 | 39,301 | 1,007 | 49,054 | 1,082 | 48,191 | 666 |
| Total, fresh | 833,153 | 31,783 | 633,840 | 25,073 | 1,855,017 | 51,570 | 6,146,501 | 144,198 |
| Landed in 1930: Fresh | 574,142 | 26,072 | 1,456,416 | 53,711 | 834,017 | 30,561 | 2,786,216 | 67,446 |

*Landings by fishing vessels at principal New England ports, 1931*—Continued

PORTLAND: BY MONTHS—Continued

| Species | May | | June | | July | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 157,561 | $4,897 | 187,154 | $8,621 | 264,914 | $11,799 |
| Market | 73,457 | 1,202 | 16,245 | 323 | 26,054 | 552 |
| Scrod | 1,825 | 16 | 1,251 | 13 | 1,030 | 9 |
| Cod, salted: | | | | | | |
| Large | | | 4,450 | 156 | 4,275 | 146 |
| Market | | | 2,340 | 59 | | |
| Scrod | | | 115 | 2 | | |
| Haddock, fresh: | | | | | | |
| Large | 376,912 | 7,536 | 96,472 | 4,391 | 142,704 | 5,891 |
| Scrod | 2,092 | 21 | 2,678 | 24 | 7,880 | 80 |
| Hake, fresh: | | | | | | |
| Large | 9,970 | 155 | 15,035 | 156 | 6,832 | 103 |
| Small | 41,395 | 550 | 45,222 | 496 | 51,572 | 682 |
| Pollock, fresh | 45,805 | 459 | 45,255 | 428 | 100,466 | 987 |
| Cusk, fresh | 81,305 | 1,378 | 6,977 | 106 | 9,683 | 117 |
| Halibut, fresh | 9,466 | 1,420 | 32,764 | 3,856 | 51,623 | 6,708 |
| Mackerel, fresh | 12,925 | 777 | 84,105 | 3,283 | 88,296 | 3,783 |
| Flounders, fresh | 18,452 | 611 | 5,775 | 168 | 28,502 | 998 |
| Swordfish, fresh | | | 16,388 | 4,830 | 90,022 | 25,061 |
| Herring, fresh | | | 108,530 | 1,086 | 400 | 4 |
| Other, fresh | 31,410 | 673 | 17,751 | 339 | 42,466 | 917 |
| Total, fresh | 862,575 | 19,695 | 681,602 | 28,120 | 912,444 | 57,691 |
| Total, salted | | | 6,905 | 217 | 4,275 | 146 |
| Grand total | 862,575 | 19,695 | 688,507 | 28,337 | 916,719 | 57,837 |
| Landed in 1930: | | | | | | |
| Fresh | 2,616,242 | 63,429 | 1,445,677 | 44,159 | 2,626,869 | 90,496 |
| Salted | 13,105 | 556 | | | 665 | 13 |
| Total | 2,629,347 | 63,985 | 1,445,677 | 44,159 | 2,627,534 | 90,509 |

| Species | August | | September | | October | | November | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | | | |
| Large | 246,639 | $11,558 | 221,126 | $10,674 | 262,588 | $11,767 | 99,001 | $4,545 |
| Market | 13,269 | 265 | 11,716 | 247 | 45,565 | 912 | 41,930 | 911 |
| Scrod | 1,260 | 11 | 1,480 | 13 | 4,430 | 36 | 6,900 | 67 |
| Cod, salted: | | | | | | | | |
| Large | 9,130 | 319 | 23,725 | 889 | 55 | 2 | | |
| Market | 1,010 | 27 | 2,700 | 68 | 20 | 1 | | |
| Haddock, fresh: | | | | | | | | |
| Large | 151,480 | 7,018 | 110,959 | 5,789 | 175,322 | 9,019 | 161,996 | 8,955 |
| Scrod | 7,235 | 69 | 4,342 | 44 | 8,485 | 76 | 3,136 | 42 |
| Hake, fresh: | | | | | | | | |
| Large | 6,210 | 79 | 16,282 | 261 | 67,550 | 958 | 59,961 | 832 |
| Small | 53,623 | 567 | 49,315 | 815 | 194,281 | 2,795 | 161,568 | 1,928 |
| Hake, salted, small | 155 | 1 | | | | | | |
| Pollock, fresh | 80,037 | 790 | 109,938 | 1,054 | 294,173 | 3,058 | 188,463 | 949 |
| Pollock, salted | | | | | 10 | | | |
| Cusk, fresh | 2,917 | 49 | 10,200 | 185 | 72,745 | 1,147 | 57,527 | 786 |
| Cusk, salted | | | 200 | 3 | | | | |
| Halibut, fresh | 58,126 | 8,665 | 19,680 | 2,622 | 2,033 | 269 | 825 | 149 |
| Mackerel, fresh | 1,420,697 | 37,146 | 672,095 | 13,516 | 12,631 | 867 | 11,847 | 649 |
| Mackerel, salted | 9,555 | 113 | | | | | | |
| Flounders, fresh | 38,080 | 1,006 | 31,848 | 1,028 | 37,877 | 1,204 | 3,945 | 163 |
| Swordfish, fresh | 90,531 | 20,741 | 26,426 | 5,794 | | | | |
| Herring, fresh | 47,600 | 494 | 193,100 | 1,272 | 295,200 | 1,724 | 22,600 | 90 |
| Other, fresh | 185,383 | 3,135 | 23,029 | 403 | 70,363 | 1,334 | 42,620 | 836 |
| Total, fresh | 2,403,087 | 91,593 | 1,501,536 | 43,717 | 1,543,243 | 35,166 | 862,319 | 20,902 |
| Total, salted | 19,850 | 460 | 26,625 | 960 | 85 | 3 | | |
| Grand total | 2,422,937 | 92,053 | 1,528,161 | 44,677 | 1,543,328 | 35,169 | 862,319 | 20,902 |
| Landed in 1930: | | | | | | | | |
| Fresh | 1,431,689 | 49,859 | 1,172,065 | 37,521 | 1,402,070 | 43,499 | 1,108,052 | 30,407 |
| Salted | 4,900 | 196 | | | | | | |
| Total | 1,436,589 | 50,055 | 1,172,065 | 37,521 | 1,402,070 | 43,499 | 1,108,052 | 30,407 |

*Landings by fishing vessels at principal New England ports, 1931*—Continued

PORTLAND: BY MONTHS—Continued

| Species | December | | Total, 1931 | | 1930 | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 62,800 | $2,717 | 3,314,761 | $119,625 | 1,987,921 | $78,428 |
| Market | 37,111 | 940 | 514,116 | 11,069 | 660,505 | 16,864 |
| Scrod | 5,195 | 51 | 33,364 | 314 | 51,642 | 540 |
| Cod, salted: | | | | | | |
| Large | | | 41,635 | 1,512 | 15,340 | 718 |
| Market | | | 6,070 | 155 | 260 | 10 |
| Scrod | | | 115 | 2 | | |
| Haddock, fresh: | | | | | | |
| Large | 96,025 | 5,859 | 7,429,541 | 215,848 | 8,589,386 | 274,188 |
| Scrod | 2,679 | 45 | 73,401 | 749 | 227,158 | 4,292 |
| Hake, fresh: | | | | | | |
| Large | 36,730 | 820 | 310,323 | 5,993 | 168,328 | 3,468 |
| Small | 103,099 | 2,201 | 938,564 | 16,484 | 1,119,273 | 23,279 |
| Hake, salted, small | | | 155 | 1 | | |
| Pollock, fresh | 176,138 | 1,108 | 1,205,240 | 10,684 | 929,624 | 15,178 |
| Pollock, salted | | | 10 | | 70 | 1 |
| Cusk, fresh | 31,814 | 625 | 671,521 | 13,148 | 628,607 | 16,722 |
| Cusk, salted | | | 200 | 3 | | |
| Halibut, fresh | 750 | 142 | 204,696 | 28,470 | 43,340 | 6,990 |
| Halibut, salted | | | | | 2,335 | 23 |
| Mackerel, fresh | 2,825 | 99 | 2,305,421 | 60,120 | 727,176 | 28,030 |
| Mackerel, salted | | | 9,555 | 113 | 665 | 13 |
| Flounders, fresh | 7,581 | 353 | 313,182 | 9,461 | 300,144 | 7,412 |
| Swordfish, fresh | | | 223,367 | 56,426 | 299,987 | 58,354 |
| Herring, fresh | | | 667,430 | 4,670 | 1,081,750 | 10,657 |
| Other, fresh | 33,974 | 686 | 627,111 | 12,093 | 1,351,014 | 21,612 |
| Total, fresh | 596,721 | 15,646 | 18,832,038 | 565,154 | 18,165,855 | 566,014 |
| Total, salted | | | 57,740 | 1,786 | 18,670 | 765 |
| Grand total | 596,721 | 15,646 | 18,889,778 | 566,940 | 18,184,525 | 566,779 |
| Landed in 1930: | | | | | | |
| Fresh | 712,400 | 28,854 | | | 18,165,855 | 566,014 |
| Salted | | | | | 18,670 | 765 |
| Total | 712,400 | 28,854 | | | 18,184,525 | 566,779 |

SUMMARY: BY PORTS

| Species | Boston | | Gloucester | | Portland | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | | | |
| Large | 23,932,629 | $794,081 | 4,670,912 | $151,511 | 3,314,761 | $119,625 |
| Market | 25,730,600 | 620,059 | 897,257 | 14,215 | 514,116 | 11,069 |
| Scrod | 244,345 | 3,882 | 10,440 | 159 | 33,364 | 314 |
| Cod, salted: | | | | | | |
| Large | 12,690 | 440 | 1,028,832 | 36,262 | 41,635 | 1,512 |
| Market | | | 201,532 | 5,015 | 6,070 | 155 |
| Scrod | | | 5,645 | 85 | 115 | 2 |
| Haddock, fresh: | | | | | | |
| Large | 106,028,345 | 3,819,572 | 4,847,223 | 134,093 | 7,429,541 | 215,848 |
| Scrod | 14,258,395 | 261,610 | 207,750 | 2,485 | 73,401 | 749 |
| Haddock, salted, large | | | 810 | 12 | | |
| Hake, fresh: | | | | | | |
| Large | 5,860,915 | 142,802 | 596,375 | 11,480 | 310,323 | 5,993 |
| Small | 43,420 | 1,144 | 1,130 | 12 | 938,564 | 16,484 |
| Hake, salted: | | | | | | |
| Large | | | 5,100 | 66 | | |
| Small | | | | | 155 | 1 |
| Pollock, fresh | 5,027,987 | 83,717 | 1,397,103 | 19,313 | 1,205,240 | 10,684 |
| Pollock, salted | | | 1,262 | 24 | 10 | |
| Cusk, fresh | 3,447,091 | 68,290 | 140,990 | 1,674 | 671,521 | 13,148 |
| Cusk, salted | | | 4,805 | 93 | 200 | 3 |
| Halibut, fresh | 2,809,826 | 341,734 | 55,469 | 5,632 | 204,696 | 28,470 |
| Halibut, salted | | | 245 | 30 | | |
| Mackerel, fresh | 19,855,052 | 889,633 | 7,298,373 | 273,477 | 2,305,421 | 60,120 |
| Mackerel, salted | 3,000 | 120 | 52,329 | 2,210 | 9,555 | 113 |

*Landings by fishing vessels at principal New England ports, 1931*—Continued

SUMMARY: BY PORTS—Continued

| Species | Boston | | Gloucester | | Portland | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Flounders, fresh | 9,493,487 | $420,205 | 468,675 | $21,199 | 313,182 | $9,461 |
| Swordfish, fresh | 1,526,342 | 399,629 | 10,620 | 2,690 | 223,367 | 56,426 |
| Herring, fresh | 5,700 | 142 | 204,700 | 3,684 | 667,430 | 4,670 |
| Herring, salted | | | 2,286,876 | 80,589 | | |
| Other, fresh | 2,165,179 | 59,434 | 455,350 | 9,813 | 627,111 | 12,093 |
| Total, fresh | 219,929,313 | 7,905,934 | 21,262,367 | 651,437 | 18,832,038 | 565,154 |
| Total, salted | 15,690 | 560 | 3,587,436 | 124,386 | 57,740 | 1,786 |
| Grand total | 219,945,003 | 7,906,494 | 24,849,803 | 775,823 | 18,889,778 | 566,940 |
| Landed in 1930: | | | | | | |
| Fresh | 285,212,778 | 10,868,671 | 43,662,508 | 1,179,995 | 18,165,855 | 566,014 |
| Salted | 44,700 | 1,915 | 3,696,959 | 168,092 | 18,670 | 765 |
| Total | 285,257,478 | 10,870,586 | 47,359,467 | 1,348,087 | 18,184,525 | 566,779 |

| Species | Total, 1931 | | 1930 | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Cod, fresh: | | | | |
| Large | 31,918,302 | $1,065,217 | 33,201,753 | $1,342,643 |
| Market | 27,141,973 | 645,343 | 31,134,541 | 754,247 |
| Scrod | 288,149 | 4,355 | 192,517 | 3,543 |
| Cod, salted: | | | | |
| Large | 1,083,157 | 38,214 | 1,351,185 | 72,571 |
| Market | 207,602 | 5,170 | 534,382 | 26,360 |
| Scrod | 5,760 | 87 | 201,454 | 8,704 |
| Haddock, fresh: | | | | |
| Large | 118,305,109 | 4,169,513 | 180,649,118 | 6,476,004 |
| Scrod | 14,539,546 | 264,844 | 8,722,215 | 169,782 |
| Haddock, salted, large | 810 | 12 | | |
| Hake, fresh: | | | | |
| Large | 6,767,613 | 160,275 | 14,395,690 | 369,593 |
| Small | 983,114 | 17,640 | 1,217,833 | 25,189 |
| Hake, salted: | | | | |
| Large | 5,100 | 66 | 4,230 | 79 |
| Small | 155 | 1 | | |
| Pollock, fresh | 7,630,330 | 113,714 | 13,976,971 | 263,740 |
| Pollock, salted | 1,272 | 24 | 3,225 | 72 |
| Cusk, fresh | 4,259,602 | 83,112 | 4,415,363 | 112,793 |
| Cusk, salted | 5,005 | 96 | 18,052 | 438 |
| Halibut, fresh | 2,569,991 | 375,836 | 2,576,198 | 442,397 |
| Halibut, salted | 245 | 30 | 5,330 | 555 |
| Mackerel, fresh | 29,458,846 | 1,223,230 | 33,433,723 | 1,154,408 |
| Mackerel, salted | 64,884 | 2,443 | 78,895 | 3,199 |
| Flounders, fresh | 10,275,344 | 450,865 | 14,406,737 | 651,410 |
| Swordfish, fresh | 1,760,329 | 458,745 | 3,381,034 | 725,949 |
| Herring, fresh | 877,830 | 8,496 | 1,159,150 | 11,431 |
| Herring, salted | 2,286,876 | 80,589 | 1,563,576 | 58,794 |
| Other, fresh | [1] 3,247,640 | 81,340 | 4,178,298 | 111,551 |
| Total, fresh | 260,023,718 | 9,122,525 | 347,041,141 | 12,614,680 |
| Total, salted | 3,660,866 | 126,732 | 3,760,329 | 170,772 |
| Grand total | 263,684,584 | 9,249,257 | 350,801,470 | 12,785,452 |
| Landed in 1930: | | | | |
| Fresh | | | 347,041,141 | 12,614,680 |
| Salted | | | 3,760,329 | 170,772 |
| Total | | | 350,801,470 | 12,785,452 |

[1] The items under "Other" include alewives, 351,800 pounds, value $4,240; butterfish, 122,571 pounds, value $9,482; eels, 10,565 pounds, value $159; cunner ("perch"), 675 pounds, value $18; rosefish, 120,287 pounds, value $1,152; salmon, 54 pounds, value $14; sea robins, 250 pounds, value $5; scup, 780 pounds, value $78; shad, 193,095 pounds, value $7,388; sharks, 57,628 pounds, value $909; skates, 41,040 pounds, value $307; smelt, 680 pounds, value $34; sturgeon, 4,054 pounds, value $406; tuna, 247 pounds, value $25; whiting, 69,598 pounds, value $2,066; wolffish, 1,773,935 pounds, value $40,669; lobsters, 192 pounds, value $50; scallops, 369 pounds, value $56; spearfish, 500 pounds, value $10; goosefish, 150 pounds, value $2; sea bass, 2,200 pounds, value $110; livers, 403,077 pounds, value $8,402; spawn, 92,544 pounds, value $5,623; and tongues, 1,349 pounds, value $135.

BIOLOGICAL ASPECT

In 1931, the fishing fleet landing fares at Boston and Gloucester, Mass., and Portland, Me., and operating on the fishing banks of the North Atlantic from Flemish Cap to New York, numbered 427 steam, motor, and sail vessels, of over 5 net tons, as measured by the United States Customs Service. These made 11,543 trips to the fishing grounds, and were absent from port 54,932 days, or an average of about 4.8 days per trip. This is 0.1 of a day less than the average length of a trip during 1930. Their catches of edible fish landed at the three ports amounted to 266,037,858 pounds when the salted fish had been converted to the basis of fresh gutted or round fish as landed. This does not represent the entire catch of edible fish of these vessels, for small quantities, estimated at not more than 5 per cent of their total catch, were landed at ports in New England other than these three, at New York City, and at ports in New Jersey.

Otter trawls on all sizes of vessels accounted for 153,566,035 pounds, or 58 per cent of the total catch. Line trawls were next in importance, accounting for 62,619,353 pounds, or 24 per cent of the total catch landed at the three ports in 1931.

The catch taken on Georges Bank was considerably larger than that taken on any other fishing ground and landed at the three ports in 1931. It amounted to 100,142,605 pounds, or 38 per cent of the total catch. It was taken mainly by otter trawls. The grounds near the shore, Browns Bank, and South Channel were next in importance, each accounting for about 15 per cent of the total catch. The catch on the grounds near the shore was taken mainly in purse seines; that on Browns Bank, mainly by line trawls; and that on South Channel, largely by otter trawls.

*Landings by fishing vessels at the three principal New England ports, 1931*

BY GEAR AND FISHING GROUNDS

| Gear and fishing ground | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small |
| | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Line trawls: | | | | | | | | | | |
| Off Funks | 1 | 1 | 5 | | | | | | | |
| Grand Bank | 5 | 8 | 183 | 4,412 | 246 | | | | 5,239 | |
| Green Bank | 3 | 3 | 70 | 4,617 | 1,377 | | | | | 307 |
| St. Peters Bank | 3 | 5 | 113 | 1,540 | 780 | | | | | 1,470 |
| Off Newfoundland | 2 | 2 | 36 | | | | | | | |
| Seal Island grounds | 2 | 2 | 11 | 3,020 | 2,945 | 270 | 10,420 | 375 | | 10,625 |
| Gulf of St. Lawrence | 2 | 2 | 70 | 575,951 | 274,671 | 11,088 | | | 2,280 | |
| Scatari Bank | 1 | 1 | 35 | 7,154 | 2,716 | | | | | |
| Quereau Bank | 10 | 14 | 308 | 73,651 | 13,302 | 228 | 1,390 | | 5,276 | |
| The Gully | 3 | 4 | 79 | 8,600 | 12,985 | | 40,000 | | | |
| Sable Island Bank (Western Bank) | 13 | 18 | 199 | 557,040 | 363,740 | | 720,305 | | 5,855 | |
| Cape Shore | 36 | 87 | 944 | 540,100 | 1,115,765 | 715 | 1,816,290 | 1,005 | 282,720 | 10,040 |
| Emerald Bank | 1 | 1 | 8 | 24,000 | 18,980 | | 38,800 | | | |
| La Have Bank | 33 | 64 | 622 | 618,137 | 859,512 | 800 | 1,799,135 | 22,250 | 82,835 | 565 |
| Roseway Bank | 4 | 5 | 41 | 49,210 | 99,300 | | 131,050 | | 10,500 | |
| Browns Bank | 52 | 369 | 3,696 | 3,900,442 | 3,734,621 | 1,020 | 11,712,350 | 15,240 | 645,095 | 16,820 |
| Georges Bank | 43 | 152 | 1,771 | 3,358,937 | 1,127,438 | 265 | 2,379,770 | 45,150 | 138,474 | |
| South Channel | 38 | 324 | 2,089 | 1,871,467 | 2,943,485 | 1,780 | 6,844,420 | 33,560 | 866,760 | 4,010 |
| Off Highland Light | 2 | 2 | 10 | 5,400 | 6,600 | | 42,900 | | 3,100 | |
| Off Chatham | 4 | 5 | 28 | 15,265 | 15,800 | 400 | 85,500 | | 22,080 | |
| Nantucket Shoals | 4 | 12 | 107 | 26,105 | 12,025 | | 28,905 | | 1,800 | |
| Cashes Bank | 16 | 31 | 125 | 73,540 | 40,050 | 2,475 | 129,125 | 2,103 | 127,765 | 56,630 |
| Fippenies Bank | 6 | 6 | 28 | 15,580 | 8,860 | | 24,815 | | 28,800 | 4,395 |
| Platts Bank | 4 | 6 | 15 | 9,935 | 4,122 | 125 | 18,210 | 540 | 8,240 | 9,825 |
| Jeffreys Ledge | 27 | 294 | 635 | 201,914 | 97,253 | 11,316 | 881,059 | 34,910 | 262,081 | 287,006 |
| Tillies Bank | 1 | 1 | 8 | 190 | | | 3,100 | 200 | 3,200 | |
| Middle Bank (Stellwagen Bank) | 7 | 54 | 274 | 40,575 | 20,928 | 800 | 424,735 | 13,065 | 206,580 | 4,000 |
| Shore, general | 51 | 329 | 917 | 344,425 | 230,874 | 20,993 | 817,036 | 32,961 | 169,368 | 263,868 |
| Total | [1] 105 | 1,802 | 12,427 | 12,331,207 | 11,008,375 | 52,275 | 27,949,315 | 201,359 | 2,878,048 | 669,561 |
| Hand lines: | | | | | | | | | | |
| Cape Shore | 5 | 16 | 136 | 170,730 | 358,150 | | 14,185 | | 400 | |
| Browns Bank | 6 | 19 | 184 | 238,945 | 338,880 | | 36,540 | | 1,050 | |
| Georges Bank | 6 | 30 | 277 | 622,260 | 399,860 | | 18,590 | | | |
| South Channel | 3 | 3 | 20 | 23,670 | 15,770 | | 4,900 | | | |
| Off Chatham | 1 | 1 | 6 | | 1,135 | | 75 | | | |
| Off Chatham (occasional) | | | | | 776 | 89 | 278 | | | |
| Nantucket Shoals | 7 | 24 | 160 | 81,615 | 157,920 | | 1,620 | 290 | 10,300 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Shore, general | 4 | 4 | 27 | 8,175 | 13,190 | 160 | 1,335 | | 2,200 | |
| Shore, general (occasional) | | | | 908 | 1,610 | 95 | 40 | | | |
| Total | [1] 17 | 97 | 810 | 1,146,303 | 1,287,291 | 344 | 77,563 | 290 | 13,950 | |
| Harpoons: | | | | | | | | | | |
| Gulf of St. Lawrence | 1 | 1 | 5 | | | | | | | |
| Gurdo Bank | 1 | 1 | 26 | | | | | | | |
| The Gully | 1 | 1 | 20 | | | | | | | |
| Cape Shore | 4 | 4 | 79 | | | | | | | |
| Browns Bank | 52 | 67 | 1,224 | | | | | | | |
| Georges Bank | 74 | 191 | 3,512 | | | | | | | |
| South Channel | 1 | 1 | 7 | | | | | | | |
| Off Chatham | 2 | 2 | 16 | | | | | | | |
| Nantucket Shoals | 2 | 2 | 29 | | | | | | | |
| Shore, general | 8 | 8 | 127 | | | | | | | |
| Total | [1] 79 | 278 | 5,045 | | | | | | | |
| Otter trawls, large: | | | | | | | | | | |
| Gulf of St. Lawrence | 1 | 1 | 15 | 4,300 | 9,400 | | 40,700 | 900 | 19,400 | |
| Sable Island Bank (Western Bank) | 38 | 93 | 1,067 | 1,576,640 | 1,389,363 | 35,130 | 6,465,365 | 226,080 | 72,330 | |
| La Have Bank | 32 | 59 | 625 | 489,075 | 680,265 | 19,775 | 2,781,660 | 171,805 | 75,945 | |
| Browns Bank | 42 | 105 | 1,042 | 1,338,310 | 794,835 | 5,010 | 8,101,157 | 405,640 | 209,850 | 100 |
| Georges Bank | 65 | 797 | 7,846 | 7,568,770 | 6,970,498 | 105,975 | 29,850,301 | 7,258,955 | 1,411,945 | 15,420 |
| South Channel | 44 | 204 | 1,864 | 1,067,288 | 1,115,635 | 14,420 | 7,887,885 | 1,131,368 | 646,025 | 1,500 |
| Off Chatham | 2 | 2 | 15 | 13,325 | 29,500 | | 61,440 | 2,900 | 11,375 | |
| Nantucket Shoals | 21 | 27 | 259 | 88,310 | 143,185 | 3,160 | 1,314,010 | 344,560 | 50,680 | |
| Shore, general | 1 | 1 | 11 | 2,000 | 2,000 | | 15,000 | 38,000 | | |
| Total | [1] 67 | 1,289 | 12,744 | 12,148,018 | 11,134,681 | 183,470 | 56,517,518 | 9,580,208 | 2,497,550 | 17,020 |
| Otter trawls, medium: | | | | | | | | | | |
| Sable Island Bank (Western Bank) | 2 | 2 | 20 | 1,800 | 7,400 | | 25,100 | 3,000 | 1,125 | |
| Cape Shore | 2 | 2 | 17 | 2,510 | 3,500 | | 50,210 | 11,500 | 1,900 | |
| La Have Bank | 11 | 15 | 129 | 73,730 | 79,070 | 500 | 559,000 | 51,655 | 12,200 | |
| Browns Bank | 35 | 73 | 622 | 425,755 | 261,140 | 7,900 | 3,172,560 | 123,935 | 20,005 | |
| Georges Bank | 68 | 775 | 6,404 | 3,042,608 | 2,005,420 | 39,805 | 16,488,970 | 3,050,995 | 381,875 | 3,500 |
| Clark Bank | 1 | 1 | 8 | 1,600 | 250 | | 16,500 | 100 | 1,700 | |
| South Channel | 59 | 345 | 2,759 | 485,390 | 1,055,085 | 10,105 | 6,784,597 | 1,024,170 | 322,070 | 1,000 |
| Off Highland Light | 1 | 1 | 4 | | 1,725 | | 3,200 | 5,800 | 2,400 | |
| Off Chatham | 9 | 25 | 159 | 44,055 | 62,890 | | 329,025 | 54,180 | 23,765 | |
| Nantucket Shoals | 34 | 64 | 504 | 23,500 | 145,800 | | 1,082,410 | 158,435 | 55,850 | |
| Cashes Bank | 1 | 1 | 5 | 800 | 1,900 | | | | 3,070 | |
| Jeffreys Ledge | 4 | 6 | 31 | 540 | 515 | | 15,895 | | 760 | |
| Middle Bank (Stellwagen Bank) | 2 | 3 | 14 | 2,075 | 125 | | 10,250 | 13,500 | 1,220 | |
| South | 1 | 1 | 3 | | | | | | | |
| Shore, general | 30 | 174 | 496 | 41,489 | 47,610 | 2,625 | 380,270 | 79,572 | 58,660 | 670 |
| Total | [1] 91 | 1,488 | 11,175 | 4,150,852 | 3,672,430 | 60,935 | 28,917,987 | 4,576,842 | 886,600 | 5,170 |

[1] Exclusive of duplication.

*Landings by fishing vessels at the three principal New England ports, 1931*—Continued

BY GEAR AND FISHING GROUNDS—Continued

| Gear and fishing ground | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small |
| | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Otter trawls, small: | | | | | | | | | | |
| Cape Shore | 1 | 1 | 7 | 50 | 200 | | 100 | | 800 | |
| Browns Bank | 1 | 1 | 7 | 2,700 | 3,400 | | 33,500 | | | |
| Georges Bank | 6 | 49 | 383 | 96,445 | 68,845 | | 642,760 | 123,025 | 10,500 | |
| South Channel | 3 | 9 | 73 | 3,840 | 25,525 | | 112,800 | 22,770 | 915 | |
| Nantucket Shoals | 5 | 7 | 45 | 1,430 | 26,845 | | 36,325 | 2,135 | 1,050 | |
| Jeffreys Ledge | 2 | 2 | 5 | 130 | 35 | | 2,165 | 80 | | |
| Shore, general | 59 | 442 | 1,115 | 69,213 | 49,294 | 1,605 | 633,208 | 31,899 | 87,098 | 38,145 |
| Total | [1] 62 | 511 | 1,635 | 173,808 | 174,144 | 1,605 | 1,460,858 | 179,909 | 100,363 | 38,145 |
| Sink gill nets: | | | | | | | | | | |
| Jeffreys Ledge | 5 | 56 | 57 | 56,651 | 5,120 | | 14,793 | | 4,710 | 19,422 |
| Shore, general | 35 | 3,613 | 3,669 | 3,969,460 | 262,683 | 925 | 3,368,743 | 938 | 396,081 | 234,103 |
| Total | 35 | 3,669 | 3,726 | 4,026,111 | 267,803 | 925 | 3,383,536 | 938 | 400,791 | 253,525 |
| Drift gill nets: | | | | | | | | | | |
| Bay of Islands | 7 | 8 | 412 | | | | | | | |
| Georges Bank | 1 | 1 | 4 | | | | | | | |
| Jeffreys Ledge | 1 | 3 | 7 | | | | | | | |
| South | 12 | 14 | 44 | | | | | | | |
| Shore, general | 84 | 741 | 1,534 | | | | | | | |
| Total | [1] 92 | 767 | 2,001 | | | | | | | |
| Purse seines: | | | | | | | | | | |
| Cape Shore | 3 | 4 | 38 | | | | | | | |
| Georges Bank | 47 | 72 | 271 | | | | | | | |
| South Channel | 36 | 45 | 167 | | | | | | | |
| Off Chatham | 55 | 94 | 407 | | | | | | | |
| Nantucket Shoals | 22 | 25 | 75 | | | | | | | |
| Middle Bank (Stellwagen Bank) | 3 | 3 | 9 | | | | | | | |
| South | 54 | 91 | 315 | | | | | | | |
| Shore, general | 124 | 1,308 | 4,087 | | | | | | | |
| Total | [1] 127 | 1,642 | 5,369 | | | | | | | |
| Grand total | [1] 427 | 11,543 | 54,932 | 33,976,299 | 27,544,724 | 299,554 | 118,306,777 | 14,539,546 | 6,777,302 | 983,421 |

NOTE.—The 3 principal New England ports are Boston and Gloucester, Mass., and Portland, Me. Otter trawls (including V-D trawls) are classified according to the size of the vessel. The weight of salted fish landed has been converted to the equivalent of fresh fish as landed. Only landings by vessels having a capacity of 5 net tons or greater are used in this tabulation. "Occasional" after the name of a bank or ground indicates that the vessel or vessels contributing to the catch as shown fished chiefly with another type of gear. In such cases the number of vessels fishing, number of trips, and number of days absent are shown under the principal type of gear used.

| Gear and fishing ground | Pollock | Cusk | Halibut | Flounders | Swordfish | Mackerel | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| Line trawls: | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Off Funks | | | 32,530 | | | | | | 32,530 |
| Grand Bank | | 885 | 273,825 | | | | | 2,500 | 287,107 |
| Green Bank | | 40 | 65,439 | | | | | | 71,780 |
| St. Peters Bank | | 2,975 | 214,734 | | | | | | 221,499 |
| Off Newfoundland | | | 81,573 | | | | | | 81,573 |
| Seal Island grounds | 672 | 6,075 | 164 | | | | | 1,850 | 36,416 |
| Gulf of St. Lawrence | | | 44,526 | | | | | | 908,516 |
| Scatari Bank | | 1,102 | 6,117 | | | | | | 17,089 |
| Quereau Bank | 247 | 15,360 | 215,794 | | 1,325 | | | 2,451 | 329,024 |
| The Gully | 355 | 10,125 | 48,671 | | | | | | 120,736 |
| Sable Island Bank (Western Bank) | 14,235 | 11,525 | 44,390 | | 195 | | | 3,040 | 1,720,325 |
| Cape Shore | 40,365 | 371,940 | 11,172 | 350 | | | | 46,260 | 4,236,722 |
| Emerald Bank | 275 | 940 | 822 | | | | | | 83,817 |
| La Have Bank | 34,800 | 148,845 | 105,682 | | 203 | 320 | | 19,320 | 3,692,404 |
| Roseway Bank | 2,100 | 18,555 | 976 | | | | | 2,375 | 314,066 |
| Browns Bank | 264,450 | 1,954,144 | 302,816 | 4,250 | 10,862 | | | 147,795 | 22,709,905 |
| Georges Bank | 91,341 | 270,156 | 585,717 | 80 | 6,295 | | | 16,023 | 8,019,646 |
| South Channel | 347,125 | 198,055 | 26,682 | 4,825 | | | | 54,205 | 13,196,374 |
| Off Highland Light | 460 | 600 | | | | | | | 59,060 |
| Off Chatham | 6,350 | 2,700 | 79 | | | | | 2,390 | 150,564 |
| Nantucket Shoals | 800 | 400 | 45,559 | | | | | 262 | 115,856 |
| Cashes Bank | 26,015 | 210,200 | 3,707 | | | | | 16,265 | 687,875 |
| Fippenies Bank | 4,230 | 18,670 | 522 | | | | | 950 | 106,822 |
| Platts Bank | 3,680 | 7,430 | 388 | | | | | 4,325 | 66,820 |
| Jeffreys Ledge | 58,896 | 300,076 | 3,104 | 3,635 | | | | 110,806 | 2,252,056 |
| Tillies Bank | 500 | 200 | | | | | | | 7,390 |
| Middle Bank (Stellwagen Bank) | 13,040 | 64,520 | 806 | | | | | 6,447 | 795,496 |
| Shore, general | 63,030 | 249,261 | 7,820 | 3,356 | | | | 94,893 | 2,297,885 |
| Total | 972,966 | 3,864,779 | 2,123,615 | 16,496 | [2] 18,880 | [2] 320 | | 532,157 | 62,619,353 |
| Hand lines: | | | | | | | | | |
| Cape Shore | 49,455 | 14,905 | 277 | | | | | 11,595 | 619,607 |
| Browns Bank | 33,615 | 20,843 | 3,917 | | | | | 14,320 | 688,110 |
| Georges Bank | 64,010 | 19,665 | 8,190 | | | | | 12,720 | 1,145,295 |
| South Channel | 3,140 | 800 | 64 | | | | | 1,450 | 49,794 |
| Off Chatham | | | | | | | | | 1,210 |
| Off Chatham (occasional) | | | | | | | | | 1,143 |
| Nantucket Shoals | 5,840 | 760 | | | | | | | 259,345 |
| Shore, general | 2,000 | 1,000 | | | | | | 275 | 28,335 |
| Shore, general (occasional) | 105 | | | | | | | | 2,758 |
| Total | 158,165 | 57,973 | 12,448 | | | | | 40,360 | 2,794,687 |

[1] Exclusive of duplication.

[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1931*—Continued

BY GEAR AND FISHING GROUNDS—Continued

| Gear and fishing ground | Pollock | Cusk | Halibut | Flounders | Swordfish | Mackerel | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Harpoons: | | | | | | | | | |
| Grand Bank (occasional) | | | | | 378 | | | | 378 |
| Green Bank (occasional) | | | | | 135 | | | | 135 |
| Gulf of St. Lawrence | | | | | 1,901 | | | | 1,901 |
| Gurdo Bank | | | | | 4,474 | | | | 4,474 |
| Quereau Bank (occasional) | | | | | 794 | | | | 794 |
| The Gully | | | | | 5,567 | | | | 5,567 |
| Cape Shore | | | | | 32,367 | | | | 32,367 |
| La Have Bank (occasional) | | | | | 1,218 | | | | 1,218 |
| Browns Bank | | | | | 519,416 | | | | 519,416 |
| Browns Bank (occasional) | | | | | 2,725 | | | | 2,725 |
| Georges Bank | | | | | 1,120,482 | | | 913 | 1,121,395 |
| Georges Bank (occasional) | | | | | 5,588 | | | | 5,588 |
| South Channel | | | | | 471 | | | | 471 |
| South Channel (occasional) | | | | | 144 | | | | 144 |
| Off Chatham | | | | | 392 | | | | 392 |
| Nantucket Shoals | | | | | 3,379 | | | | 3,379 |
| Shore, general | | | | | 41,431 | | | | 41,431 |
| Shore, general (occasional) | | | | | 263 | | | | 263 |
| Total | | | | | 1,741,125 | | | 913 | 1,742,038 |
| Otter trawls, large: | | | | | | | | | |
| Gulf of St. Lawrence | | | | 2,800 | | | | | 77,500 |
| Sable Island Bank (Western Bank) | 373,000 | 2,685 | 38,301 | 185,105 | | | | 190,914 | 10,554,913 |
| La Have Bank | 170,100 | 12,490 | 26,559 | 157,460 | | 100 | | 88,653 | 4,673,887 |
| Browns Bank | 256,110 | 22,080 | 57,317 | 147,950 | | | | 219,997 | 11,558,356 |
| Georges Bank | 2,166,135 | 220,865 | 172,725 | 1,955,136 | | 9,515 | 5,700 | 638,856 | 58,350,796 |
| South Channel | 559,820 | 36,985 | 39,877 | 589,200 | | 1,633 | | 187,613 | 13,279,249 |
| Off Chatham | 4,450 | 100 | | 2,850 | | | | 2,580 | 128,520 |
| Nantucket Shoals | 44,600 | 600 | 1,535 | 87,405 | | | | 34,265 | 2,112,310 |
| Shore, general | | | | 2,000 | | | | | 59,000 |
| Total | 3,574,215 | 295,805 | 336,314 | 3,129,906 | | [2] 11,248 | [2] 5,700 | 1,362,878 | 100,794,531 |
| Otter trawls, medium: | | | | | | | | | |
| Sable Island Bank (Western Bank) | 1,645 | | 15 | 135 | | | | | 40,220 |
| Cape Shore | 1,050 | 800 | 129 | 1,225 | | | | 390 | 73,214 |
| La Have Bank | 19,005 | 1,290 | 4,059 | 23,045 | | | | 9,915 | 833,469 |
| Browns Bank | 48,710 | 3,790 | 10,895 | 86,310 | | | | 70,225 | 4,231,225 |
| Georges Bank | 321,545 | 11,450 | 59,289 | 3,117,210 | | 1,100 | | 190,412 | 28,714,179 |
| Clark Bank | 2,300 | | | 585 | | | | | 23,035 |
| South Channel | 126,907 | 2,570 | 16,320 | 1,074,595 | | 395 | | 117,678 | 11,020,882 |
| Off Highland Light | 100 | | | 815 | | | | 120 | 14,160 |
| Off Chatham | 47,660 | 250 | 458 | 53,025 | | | | 22,620 | 637,928 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Nantucket Shoals | 8,020 | | 2,092 | 463,305 | | 50 | | 12,866 | 1,957,328 |
| Cashes Bank | | 15,000 | | | | | | | 20,770 |
| Jeffreys Ledge | | 330 | | 29,003 | | | | 835 | 47,878 |
| Middle Bank (Stellwagen Bank) | | | | 10,230 | | | | 225 | 37,625 |
| South | | | | 400 | | | | 2,980 | 3,380 |
| Shore, general | 24,515 | 860 | 424 | 419,870 | | | | 36,312 | 1,092,877 |
| Total | 601,457 | 36,340 | 93,681 | 5,279,753 | | [2] 1,545 | | 464,578 | 48,748,170 |
| Otter trawls, small: | | | | | | | | | |
| Cape Shore | | | | 15,100 | | | | | 16,250 |
| Browns Bank | 450 | | 43 | 1,435 | | | | 1,200 | 42,728 |
| Georges Bank | 595 | | 3,561 | 340,783 | | | | 4,165 | 1,290,679 |
| South Channel | 50 | | 95 | 50,885 | | | | 50 | 216,930 |
| Nantucket Shoals | 150 | | | 58,015 | | | | 858 | 126,808 |
| Jeffreys Ledge | | | | 2,605 | | | | 200 | 5,215 |
| Shore, general | 4,412 | 1,910 | 161 | 1,337,392 | | | | 70,387 | 2,324,724 |
| Total | 5,657 | 1,910 | 3,860 | 1,806,215 | | | | 76,860 | 4,023,334 |
| Sink gill nets: | | | | | | | | | |
| Jeffreys Ledge | 121,980 | 477 | | | | | | 14,201 | 237,354 |
| Shore, general | 2,198,307 | 11,827 | 563 | 42,974 | | | | 276,802 | 10,763,406 |
| Total | 2,320,287 | 12,304 | 563 | 42,974 | | | | 291,003 | 11,000,760 |
| Drift gill nets: | | | | | | | | | |
| Bay of Islands | | | | | | | 3,555,314 | | 3,555,314 |
| Georges Bank | | | | | | 9,147 | | | 9,147 |
| Jeffreys Ledge | | | | | | 4,920 | | | 4,920 |
| South | | | | | | 150,760 | | 25 | 150,785 |
| Shore, general | | | | | | 1,486,100 | 200 | 19,623 | 1,505,923 |
| Shore, general (occasional) | | | | | | 9,290 | | | 9,290 |
| Total | | | | | | 1,660,217 | 3,555,514 | 19,648 | 5,235,379 |
| Purse seines: | | | | | | | | | |
| Cape Shore | | | | | | 189,784 | | | 189,784 |
| Georges Bank | | | | | | 1,485,450 | | 430 | 1,485,880 |
| South Channel | | | | | | 1,170,885 | | 600 | 1,171,485 |
| Off Chatham | | | | | | 1,037,980 | | 1,330 | 1,039,310 |
| Nantucket Shoals | | | | | | 784,972 | | 250 | 785,222 |
| Middle Bank (Stellwagen Bank) | | | | | | 69,775 | | | 69,775 |
| South | | | | | | 2,098,290 | | 150 | 2,098,450 |
| Shore, general | | | | | 324 | 21,035,973 | 746,930 | 456,383 | 22,239,610 |
| Total | | | | | [2] 324 | 27,873,109 | 746,930 | 459,153 | 29,079,516 |
| Scallop drags: Shore, general (occasional) | | | | | | | | 90 | 90 |
| Grand total | 7,632,747 | 4,269,111 | 2,570,481 | 10,275,344 | 1,760,329 | 29,546,439 | 4,308,144 | 3,247,640 | 266,037,858 |

[2] Incidental catch.

*Landings by fishing vessels at the three principal New England ports, 1931*—Continued

SUMMARY: BY FISHING GROUNDS

| Fishing ground | Vessels fishing | Trips | Days absent | Cod | | | Haddock | | Hake | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Large | Market | Scrod | Large | Scrod | Large | Small |
| *East of 66° W. longitude* | | | | | | | | | | |
| Off Newfoundland: | *Number* | *Number* | *Number* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Off Funks | 1 | 1 | 5 | | | | | | | |
| Grand Bank | 5 | 8 | 183 | 4,412 | 246 | | | | 5,239 | |
| Green Bank | 3 | 3 | 70 | 4,617 | 1,377 | | | | | 307 |
| St. Peters Bank | 3 | 5 | 113 | 1,540 | 780 | | | | | 1,470 |
| Bay of Islands | 7 | 8 | 412 | | | | | | | |
| Off Newfoundland | 2 | 2 | 36 | | | | | | | |
| Total | [1] 17 | 27 | 819 | 10,569 | 2,403 | | | | 5,239 | 1,777 |
| Off Canada: | | | | | | | | | | |
| Seal Island grounds | 2 | 2 | 11 | 3,020 | 2,945 | 270 | 10,420 | 375 | | 10,625 |
| Gulf of St. Lawrence | 4 | 4 | 90 | 580,251 | 284,071 | 11,088 | 40,700 | 900 | 21,680 | |
| Scatari Bank | 1 | 1 | 35 | 7,154 | 2,716 | | | | | |
| Gurdo Bank | 1 | 1 | 26 | | | | | | | |
| Quereau Bank | 10 | 14 | 308 | 73,651 | 13,302 | 228 | 1,390 | | 5,276 | |
| The Gully | 4 | 5 | 99 | 8,600 | 12,985 | | 40,000 | | | |
| Sable Island Bank (Western Bank) | 52 | 113 | 1,286 | 2,135,480 | 1,760,503 | 35,130 | 7,210,770 | 229,080 | 79,310 | |
| Cape Shore | 48 | 114 | 1,221 | 713,390 | 1,477,615 | 715 | 1,880,785 | 12,505 | 285,820 | 10,040 |
| Emerald Bank | 1 | 1 | 8 | 24,000 | 18,980 | | 38,800 | | | |
| La Have Bank | 75 | 138 | 1,376 | 1,180,942 | 1,618,847 | 21,075 | 5,139,795 | 245,710 | 170,980 | 565 |
| Roseway Bank | 4 | 5 | 41 | 49,210 | 99,300 | | 131,050 | | 10,500 | |
| Total | [1] 125 | 398 | 4,501 | 4,775,698 | 5,291,264 | 68,506 | 14,493,710 | 488,570 | 573,566 | 21,230 |
| *West of 66° W. longitude* | | | | | | | | | | |
| Off United States: | | | | | | | | | | |
| Browns Bank | 166 | 634 | 6,775 | 5,906,152 | 5,132,876 | 13,930 | 23,056,107 | 544,815 | 876,000 | 16,920 |
| Georges Bank | 274 | 2,067 | 20,468 | 14,689,020 | 10,572,061 | 146,045 | 49,380,391 | 10,478,125 | 1,942,794 | 18,920 |
| Clark Bank | 1 | 1 | 8 | 1,600 | 250 | | 16,500 | 100 | 1,700 | |
| South Channel | 180 | 931 | 6,979 | 3,451,655 | 5,155,500 | 26,305 | 21,634,602 | 2,211,868 | 1,835,770 | 6,510 |
| Off Highland Light | 3 | 3 | 14 | 5,400 | 8,325 | | 46,100 | 5,800 | 5,500 | |
| Off Chatham | 71 | 129 | 631 | 72,645 | 110,101 | 489 | 476,318 | 57,080 | 57,220 | |
| Nantucket Shoals | 91 | 161 | 1,179 | 225,960 | 485,775 | 3,160 | 2,463,270 | 505,420 | 119,680 | |
| Cashes Bank | 16 | 32 | 130 | 74,340 | 41,950 | 2,475 | 129,125 | 2,103 | 130,835 | 56,630 |
| Fippenies Bank | 6 | 6 | 28 | 15,580 | 8,860 | | 24,815 | | 28,800 | 4,395 |
| Platts Bank | 4 | 6 | 15 | 9,935 | 4,122 | 125 | 18,210 | 540 | 8,240 | 9,825 |
| Jeffreys Ledge | 38 | 361 | 735 | 259,235 | 102,923 | 11,316 | 913,912 | 34,990 | 267,551 | 306,428 |
| Tillies Bank | 1 | 1 | 8 | 190 | | | 3,100 | 200 | 3,200 | |
| Middle Bank (Stellwagen Bank) | 12 | 60 | 297 | 42,650 | 21,053 | 800 | 434,985 | 26,565 | 207,800 | 4,000 |
| South | 65 | 106 | 362 | | | | | | | |
| Shore, general | 257 | 6,620 | 11,983 | 4,435,670 | 607,261 | 26,403 | 5,215,632 | 183,370 | 713,407 | 536,786 |
| Total | [1] 416 | 11,118 | 49,612 | 29,190,032 | 22,251,057 | 231,048 | 103,813,067 | 14,050,976 | 6,198,497 | 960,414 |
| Grand total | [1] 427 | 11,543 | 54,932 | 33,976,299 | 27,544,724 | 299,554 | 118,306,777 | 14,539,546 | 6,777,302 | 983,421 |

| Fishing ground | Pollock | Cusk | Halibut | Flounders | Swordfish | Mackerel | Herring | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| *East of 66° W. longitude* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Off Newfoundland: | | | | | | | | | |
| Off Funks | | | 32,530 | | | | | | 32,530 |
| Grand Bank | | 885 | 273,825 | | 378 | | | 2,500 | 287,485 |
| Green Bank | | 40 | 65,439 | | 135 | | | | 71,915 |
| St. Peters Bank | | 2,975 | 214,734 | | | | | | 221,499 |
| Bay of Islands | | | | | | | 3,555,314 | | 3,555,314 |
| Off Newfoundland | | | 81,573 | | | | | | 81,573 |
| Total | | 3,900 | 668,101 | | 513 | | 3,555,314 | 2,500 | 4,250,316 |
| Off Canada: | | | | | | | | | |
| Seal Island grounds | 672 | 6,075 | 164 | | | | | 1,850 | 36,416 |
| Gulf of St. Lawrence | | | 44,526 | 2,800 | 1,901 | | | | 987,917 |
| Scatari Bank | | 1,102 | 6,117 | | | | | | 17,089 |
| Gurdo Bank | | | | | 4,474 | | | | 4,474 |
| Quereau Bank | 247 | 15,360 | 215,794 | | 2,119 | | | 2,451 | 329,818 |
| The Gully | 355 | 10,125 | 48,671 | | 5,567 | | | | 126,303 |
| Sable Island Bank (Western Bank) | 388,880 | 14,210 | 82,706 | 185,240 | 195 | | | 193,954 | 12,315,458 |
| Cape Shore | 90,870 | 387,645 | 11,578 | 16,675 | 32,367 | 189,784 | | 58,245 | 5,168,034 |
| Emerald Bank | 275 | 940 | 822 | | | | | | 83,817 |
| La Have Bank | 223,905 | 162,625 | 136,300 | 180,505 | 1,421 | 420 | | 117,888 | 9,200,978 |
| Roseway Bank | 2,100 | 18,555 | 976 | | | | | 2,375 | 314,066 |
| Total | 707,304 | 618,637 | 547,654 | 385,220 | 48,044 | 190,204 | | 376,763 | 28,584,370 |
| *West of 66° W. longitude* | | | | | | | | | |
| Off United States: | | | | | | | | | |
| Browns Bank | 603,335 | 2,000,857 | 374,988 | 239,945 | 533,003 | | | 453,537 | 39,752,465 |
| Georges Bank | 2,643,626 | 522,136 | 829,482 | 5,413,209 | 1,132,365 | 1,505,212 | 5,700 | 863,519 | 100,142,605 |
| Clark Bank | 2,300 | | | 585 | | | | | 23,035 |
| South Channel | 1,037,042 | 238,410 | 83,038 | 1,719,505 | 615 | 1,172,913 | | 361,596 | 38,935,329 |
| Off Highland Light | 560 | 600 | | 815 | | | | 120 | 73,220 |
| Off Chatham | 58,460 | 3,050 | 537 | 55,875 | 392 | 1,037,980 | | 28,920 | 1,959,067 |
| Nantucket Shoals | 59,410 | 1,760 | 49,186 | 608,725 | 3,379 | 785,022 | | 48,501 | 5,359,248 |
| Cashes Bank | 26,015 | 225,200 | 3,707 | | | | | 16,265 | 708,645 |
| Fippenies Bank | 4,230 | 18,670 | 522 | | | | | 950 | 106,822 |
| Platts Bank | 3,680 | 7,430 | 388 | | | | | 4,325 | 66,820 |
| Jeffreys Ledge | 180,876 | 300,883 | 3,104 | 35,243 | | 4,920 | | 126,042 | 2,547,423 |
| Tillies Bank | 500 | 200 | | | | | | | 7,390 |
| Middle Bank (Stellwagen Bank) | 13,040 | 64,520 | 806 | 10,230 | | 69,775 | | 6,672 | 902,896 |
| South | | | | 400 | | 2,249,050 | | 3,165 | 2,252,615 |
| Shore, general | 2,292,369 | 264,858 | 8,968 | 1,805,592 | 42,018 | 22,531,363 | 747,130 | 954,765 | 40,365,592 |
| Total | 6,925,443 | 3,648,574 | 1,354,726 | 9,890,124 | 1,711,772 | 29,356,235 | 752,830 | 2,868,377 | 233,203,172 |
| Grand total | 7,632,747 | 4,269,111 | 2,570,481 | 10,275,344 | 1,760,329 | 29,546,439 | 4,308,144 | 3,247,640 | 266,037,858 |

[1] Exclusive of duplication.

NOTE.—The weight of salted fish landed has been converted to the equivalent of fresh fish as landed.

*Days' absence from port of fishing vessels landing fish at Boston and Gloucester, Mass., and Portland, Me., 1931*

| Fishing ground | January | February | March | April | May | June | July |
|---|---|---|---|---|---|---|---|
| Off Newfoundland: | | | | | | | |
| Grand Bank | | | | 2 | 91 | | 47 |
| Green Bank | | 27 | | | | | |
| St. Peters Bank | | 21 | 44 | 27 | | | 21 |
| Bay of Islands | 316 | | | | | | |
| Off Newfoundland | | | | | | | 36 |
| Total | 316 | 48 | 44 | 29 | 91 | | 104 |
| Off Canada: | | | | | | | |
| Gulf of St. Lawrence | | | | | 22 | | |
| Scatari Bank | | | | | | 35 | |
| Quereau Bank | | | | 5 | 45 | 141 | |
| The Gully | | | 24 | 55 | | | |
| Sable Island Bank (Western Bank) | 240 | | 98 | 347 | 97 | 62 | 93 |
| Cape Shore | 39 | | | | 16 | 54 | 23 |
| Emerald Bank | | | | | | | 8 |
| La Have Bank | 198 | 146 | 40 | 101 | 52 | 32 | 70 |
| Roseway Bank | | | | | 8 | | |
| Total | 477 | 146 | 162 | 508 | 240 | 324 | 194 |
| Off United States: | | | | | | | |
| Browns Bank | 718 | 899 | 978 | 1,212 | 341 | 122 | 614 |
| Georges Bank | 1,644 | 1,276 | 1,982 | 1,028 | 1,446 | 2,047 | 2,430 |
| Clark Bank | 8 | | | | | | |
| South Channel | 488 | 240 | 366 | 136 | 435 | 740 | 1,114 |
| Off Chatham | 15 | 20 | 28 | 10 | 19 | 24 | 405 |
| Nantucket Shoals | 80 | 41 | 60 | 35 | 127 | 54 | 194 |
| Cashes Bank | 24 | | 10 | 14 | 19 | | 5 |
| Fippenies Bank | | | | 5 | | | |
| Platts Bank | 5 | 2 | | | | | |
| Jeffreys Ledge | 190 | 141 | 91 | 16 | 14 | 7 | 1 |
| Middle Bank (Stellwagen Bank) | 50 | 49 | 37 | 4 | | | 6 |
| South | | | | 9 | 274 | 79 | |
| Shore, general | 684 | 595 | 741 | 912 | 756 | 1,059 | 605 |
| Total | 3,906 | 3,263 | 4,293 | 3,381 | 3,431 | 4,132 | 5,374 |
| Grand total | 4,699 | 3,457 | 4,499 | 3,918 | 3,762 | 4,456 | 5,672 |

| Fishing ground | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|
| Off Newfoundland: | | | | | | |
| Off Funks | 5 | | | | | 5 |
| Grand Bank | 43 | | | | | 183 |
| Green Bank | 43 | | | | | 70 |
| St. Peters Bank | | | | | | 113 |
| Bay of Islands | | | | | 96 | 412 |
| Off Newfoundland | | | | | | 36 |
| Total | 91 | | | | 96 | 819 |
| Off Canada: | | | | | | |
| Seal Island grounds | | | 11 | | | 90 |
| Gulf of St. Lawrence | 48 | | 5 | 15 | | 11 |
| Scatari Bank | | | | | | 35 |
| Gurdo Bank | | 26 | | | | 26 |
| Quereau Bank | 22 | 63 | 32 | | | 308 |
| The Gully | 20 | | | | | 99 |
| Sable Island Bank (Western Bank) | | 32 | 71 | 129 | 117 | 1,286 |
| Cape Shore | 70 | 93 | 95 | 470 | 361 | 1,221 |
| Emerald Bank | | | | | | 8 |
| La Have Bank | 87 | 87 | 183 | 170 | 210 | 1,376 |
| Roseway Bank | 5 | | | | 28 | 41 |
| Total | 252 | 301 | 397 | 784 | 716 | 4,501 |
| Off United States: | | | | | | |
| Browns Bank | 934 | 259 | 117 | 160 | 421 | 6,775 |
| Georges Bank | 1,719 | 2,592 | 1,353 | 1,591 | 1,360 | 20,468 |
| Clark Bank | | | | | | 8 |
| South Channel | 1,061 | 711 | 1,048 | 446 | 194 | 6,979 |
| Off Highland Light | | 3 | 7 | 4 | | 14 |
| Off Chatham | 46 | | 36 | 15 | 13 | 631 |
| Nantucket Shoals | 73 | 96 | 150 | 173 | 96 | 1,179 |
| Cashes Bank | | | 5 | 42 | 11 | 130 |

*Days' absence from port of fishing vessels landing fish at Boston and Gloucester, Mass., and Portland, Me., 1931*—Continued

| Fishing ground | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|
| Off United States—Continued. | | | | | | |
| Fippenies Bank | | | 5 | 9 | 9 | 28 |
| Platts Bank | | | 5 | 3 | | 15 |
| Jeffreys Ledge | 2 | 11 | 91 | 83 | 88 | 735 |
| Tillies Bank | | | | | 8 | 8 |
| Middle Bank (Stellwagen Bank) | | | 14 | 58 | 79 | 297 |
| South | | | | | | 362 |
| Shore, general | 1,768 | 1,729 | 1,021 | 1,343 | 770 | 11,983 |
| Total | 5,603 | 5,401 | 3,852 | 3,927 | 3,049 | 49,612 |
| Grand total | 5,946 | 5,702 | 4,249 | 4,711 | 3,861 | 54,932 |

## MACKEREL FISHERY OF THE ATLANTIC COAST

That part of the 1931 mackerel catch taken by purse seines and drift gill nets and landed at the principal Atlantic receiving ports amounted to 36,483,472 pounds, a decrease of 16 per cent as compared with similar figures for the previous year. Because of their importance in certain seasons, the catch of fishing boats of less than 5 net tons capacity has been included in so far as data were available. The catch by shore gear, such as pound nets and traps, were omitted. Practically all of the statistics were collected by the bureau's agents at Cape May, N. J.; New York City, N. Y.; Boston, Gloucester, and Woods Hole, Mass.; and Portland, Me. A few of the landings, particularly at ports not having a bureau representative, were secured from unofficial sources and often consisted of estimated rather than "weighed out" fares. The error involved is probably well under 5 per cent in the vessel fishery. The figures on the boat fishery are probably less complete.

*Mackerel fishery of the Atlantic coast, 1931*

CATCH: BY PORTS IN 5-DAY PERIODS [1]

| Date | Cape May, Wildwood, and Atlantic City | New York | Newport, New Bedford, Cape Cod Canal, Woods Hole, Nantucket, and Provincetown | Boston | Gloucester | Portland, Rockland, Boothbay, and Southwest Harbor | Total |
|---|---|---|---|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| April 6-10 | 14,500 | | | | | | 14,500 |
| April 11-15 | 1,900 | | | | | | 1,900 |
| April 16-20 | 942,222 | 86,700 | | | | | 1,028,922 |
| April 21-25 | 608,378 | 13,970 | | | | | 622,348 |
| April 26-30 | 145,500 | 5,458 | | 57,300 | | | 208,258 |
| May 1-5 | 559,233 | 182,475 | 1,800 | 31,380 | | | 774,888 |
| May 6-10 | 475,450 | 107,136 | 350 | | | | 582,936 |
| May 11-15 | 104,250 | 654,325 | 66,103 | 548,300 | | | 1,373,478 |
| May 16-20 | | 167,850 | 200,540 | 271,500 | 1,175 | | 641,065 |
| May 21-25 | | 154,239 | 193,555 | 384,685 | 24,450 | 655 | 757,584 |
| May 26-31 | | 89,530 | 376,251 | 684,375 | 215,720 | 12,270 | 1,378,146 |
| June 1-5 | | 90,000 | 117,663 | 662,380 | 51,485 | 13,870 | 935,398 |
| June 6-10 | | 38,000 | 50,075 | 426,840 | 95,519 | 1,165 | 611,599 |

[1] The landings at the ports of Boston, Gloucester, and Portland vary somewhat from those published under "Vessel fisheries at principal New England ports" in the annual reports of the division of fishery industries, due to the inclusion of landings of some small boats in the above data and also to different methods in the collection of the statistics.

*Mackerel fishery of the Atlantic coast, 1931*—Continued

CATCH: BY PORTS IN 5-DAY PERIODS—Continued.

| Date | Cape May, Wildwood, and Atlantic City | New York | Newport, New Bedford, Cape Cod Canal, Woods Hole, Nantucket, and Provincetown | Boston | Gloucester | Portland, Rockland, Boothbay, and Southwest Harbor | Total |
|---|---|---|---|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| June 11-15 | | | 40,415 | 174,930 | 9,435 | 3,601 | 228,381 |
| June 16-20 | | 20,000 | 68,590 | 1,067,891 | 97,095 | 15,282 | 1,268,858 |
| June 21-25 | | 11,000 | 268,000 | 609,270 | 28,370 | 37,962 | 954,602 |
| June 26-30 | | | 5,600 | 539,025 | 76,455 | 12,225 | 633,305 |
| July 1-5 | | | | 1,068,645 | 196,370 | 42,596 | 1,307,611 |
| July 6-10 | | | 21,500 | 1,126,930 | 152,050 | 8,085 | 1,308,565 |
| July 11-15 | | | 89,625 | 642,720 | 66,720 | 5,935 | 805,000 |
| July 16-20 | | | | 729,262 | 187,655 | 1,770 | 918,687 |
| July 21-25 | | | 31,000 | 325,800 | 50,380 | 730 | 407,910 |
| July 26-31 | | | 4,275 | 420,225 | 72,550 | 29,180 | 526,230 |
| Aug. 1-5 | | | | 923,131 | 235,875 | 190,840 | 1,349,846 |
| Aug. 6-10 | | | 13,000 | 426,275 | 274,715 | 189,855 | 903,845 |
| Aug. 11-15 | | | | 393,005 | 49,350 | 104,076 | 546,431 |
| Aug. 16-20 | | | | 1,406,915 | 562,172 | 248,175 | 2,217,262 |
| Aug. 21-25 | | | | 1,444,310 | 1,171,383 | 281,388 | 2,897,081 |
| Aug. 26-31 | | | 60,000 | 943,440 | 771,000 | 401,862 | 2,176,302 |
| Sept. 1-5 | | | | 629,070 | 222,355 | 96,185 | 947,610 |
| Sept. 6-10 | | | | 592,985 | 401,080 | 77,850 | 1,071,915 |
| Sept. 11-15 | | | | 899,025 | 626,902 | 238,795 | 1,764,722 |
| Sept. 16-20 | | | 15,000 | 445,430 | 207,470 | 161,723 | 829,623 |
| Sept. 21-25 | | | | 499,930 | 633,655 | 227,487 | 1,361,072 |
| Sept. 26-30 | | | | 327,600 | 213,160 | 12,820 | 553,580 |
| Oct. 1-5 | | | 4,500 | 284,830 | 167,305 | 1,843 | 458,478 |
| Oct. 6-10 | | | 1,535 | 273,830 | 26,466 | 4,355 | 306,186 |
| Oct. 11-15 | | | 3,633 | 52,530 | 88,543 | 5,035 | 149,741 |
| Oct. 16-20 | | | | 59,645 | 2,445 | 277 | 62,367 |
| Oct. 21-25 | | | | 184,747 | 68,040 | 342 | 253,129 |
| Oct. 26-31 | | | | | 4,815 | 779 | 5,594 |
| Nov. 1-5 | | | | 1,390 | 4,340 | 773 | 6,503 |
| Nov. 6-10 | | | | | 12,496 | 489 | 12,985 |
| Nov. 11-15 | | | | | 31,741 | 750 | 32,491 |
| Nov. 16-20 | | | | 49,925 | 58,020 | 475 | 108,420 |
| Nov. 21-25 | | | | 106,017 | 565,575 | 9,360 | 680,952 |
| Nov. 26-30 | | | | 45,630 | 217,922 | | 263,552 |
| Dec. 1-5 | | | | 46,868 | 65,548 | | 112,416 |
| Dec. 6-10 | | | | 24,420 | 74,522 | | 98,942 |
| Dec. 11-15 | | | | 1,300 | 18,116 | | 19,416 |
| Dec. 16-20 | | | | 2,100 | 740 | | 2,840 |
| Total | 2,851,433 | 1,621,183 | 1,633,010 | 19,835,806 | 8,101,180 | 2,440,860 | 36,483,472 |

OPERATING UNITS AND CATCH: BY FLEET CLASSIFICATION AND GROUNDS

| Designation | Vessels and boats | Tonnage | Crew | Trips | Total catch |
|---|---|---|---|---|---|
| SOUTHERN | *Number* | *Net tons* | *Number* | *Number* | *Pounds* |
| Seiners: | | | | | |
| Regular vessels | 36 | 1,386 | 460 | 212 | 3,742,709 |
| Miscellaneous vessels | 19 | 710 | 218 | 47 | 721,189 |
| Netters: | | | | | |
| Regular vessels | 19 | 409 | 135 | 121 | 594,841 |
| Miscellaneous vessels | 17 | 283 | 107 | 49 | 181,335 |
| Miscellaneous boats | 2 | | | 4 | 4,165 |
| Total | [1] 91 | 2,788 | 920 | 433 | 5,244,239 |

[1] Exclusive of boats and of duplication.

*Mackerel fishery of the Atlantic coast, 1931*—Continued

OPERATING UNITS AND CATCH: BY FLEET CLASSIFICATION AND GROUNDS—Continued

| Designation | Vessels and boats | Tonnage | Crew | Trips | Total catch |
|---|---|---|---|---|---|
| BLOCK ISLAND | | | | | |
| Seiners: | *Number* | *Net tons* | *Number* | *Number* | *Pounds* |
| Regular vessels (spring) | 47 | 1,645 | 587 | 261 | 4,300,955 |
| Miscellaneous vessels (spring) | 32 | 798 | 259 | 63 | 932,478 |
| Miscellaneous vessels (summer) | 24 | 930 | 297 | 34 | 886,547 |
| Netters: | | | | | |
| Regular vessels | 16 | 262 | 99 | 63 | 555,127 |
| Miscellaneous vessels | 25 | 461 | 157 | 36 | 332,866 |
| Miscellaneous boats | 8 | | | 18 | 55,209 |
| Total | [1] 121 | 4,096 | 1,399 | 475 | 7,063,182 |
| GULF OF MAINE | | | | | |
| Seiners: | | | | | |
| Regular vessels | 55 | 1,883 | 673 | 918 | 17,288,071 |
| Miscellaneous vessels | 54 | 1,236 | 457 | 398 | 5,013,146 |
| Miscellaneous boats | 7 | | | 23 | 151,450 |
| Netters: | | | | | |
| Spring— | | | | | |
| Regular vessels | 2 | 18 | 9 | 28 | 39,844 |
| Miscellaneous vessels | 9 | 119 | 45 | 13 | 22,930 |
| Miscellaneous boats | 6 | | | 17 | 13,800 |
| Fall— | | | | | |
| Regular vessels | 46 | 1,140 | 348 | 596 | 1,110,824 |
| Miscellaneous vessels | 31 | 645 | 217 | 124 | 235,004 |
| Miscellaneous boats | 11 | | | 26 | 13,658 |
| Total | [1] 147 | 5,041 | 1,749 | 2,143 | 23,888,727 |
| CAPE SHORE | | | | | |
| Seiners, regular vessels | 5 | 262 | 70 | 6 | 287,324 |
| Total seiners | [1] 112 | | | 1,962 | 33,323,869 |
| Total netters | [1] 94 | | | 1,095 | 3,159,603 |
| Grand total | [1] 160 | | | 3,057 | 36,483,472 |

[1] Exclusive of boats and of duplication.

## FISHERIES OF THE MIDDLE ATLANTIC STATES [6]

The yield of fishery products in the Middle Atlantic States (New York, New Jersey, Pennsylvania, and Delaware) during 1930 amounted to 193,867,981 pounds, valued at $13,063,672. This is an increase of 2 per cent in the amount of the catch, but a decrease of 8 per cent in the value of the catch as compared with the quantity and its value for 1929. Of the total catch in 1930, 131,637,591 pounds, valued at $3,587,793, were fish; and 62,230,390 pounds, valued at $9,475,879, were shellfish and miscellaneous products. These fisheries gave employment to 10,065 fishermen or 1 per cent more than in 1929. Of the total number of fishermen employed during 1930, 4,665 regular fishermen were engaged on vessels, and 3,180 regular and 2,760 casual fishermen were employed in the shore and boat fisheries.

[6] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical Survey Procedure" which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

*Fisheries of the Middle Atlantic States, 1930*

SUMMARY OF CATCH

| Product | New York | | New Jersey | | Pennsylvania | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 27,280,562 | $1,067,939 | 55,578,024 | $1,993,577 | 16,745 | $2,803 |
| Shellfish, etc. | 18,213,989 | 3,865,710 | 41,697,861 | 5,480,848 | | |
| Total | 45,494,551 | 4,933,649 | 97,275,885 | 7,474,425 | 16,745 | 2,803 |

| Product | Delaware | | Total | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Fish | 48,762,260 | $523,474 | 131,637,591 | $3,587,793 |
| Shellfish, etc. | 2,318,540 | 129,321 | 62,230,390 | 9,475,879 |
| Total | 51,080,800 | 652,795 | 193,867,981 | 13,063,672 |

OPERATING UNITS: BY STATES

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 707 | 3,292 | | 666 | 4,665 |
| On boats and shore— | | | | | |
| Regular | 1,236 | 1,747 | | 197 | 3,180 |
| Casual | 1,157 | 1,177 | 52 | 374 | 2,760 |
| Total | 3,100 | 6,216 | 52 | 1,237 | 10,605 |
| Vessels: | | | | | |
| Steam | 1 | | | 14 | 15 |
| Net tonnage | 36 | | | 1,904 | 1,940 |
| Motor | 168 | 286 | | 9 | 463 |
| Net tonnage | 2,275 | 4,434 | | 289 | 6,998 |
| Sail | 10 | 77 | | 10 | 97 |
| Net tonnage | 88 | 2,085 | | 133 | 2,306 |
| Total vessels | 179 | 363 | | 33 | 575 |
| Total net tonnage | 2,399 | 6,519 | | 2,326 | 11,244 |
| Boats: | | | | | |
| Motor | 562 | 1,379 | 5 | 68 | 2,014 |
| Other | 1,080 | 750 | 14 | 192 | 2,036 |
| Accessory boats | 79 | 121 | | 86 | 286 |
| Apparatus: | | | | | |
| Purse seines— | | | | | |
| Menhaden | 4 | 1 | | 16 | 21 |
| Length, yards | 1,340 | 456 | | 6,528 | 8,324 |
| Other | 1 | 15 | | | 16 |
| Length, yards | 400 | 5,880 | | | 6,280 |
| Haul seines | 141 | 102 | 11 | 87 | 341 |
| Length, yards | 20,503 | 11,898 | 1,380 | 23,970 | 57,751 |
| Gill nets— | | | | | |
| Anchor | 198 | 5 | | | 203 |
| Square yards | 34,387 | 5,940 | | | 40,327 |
| Drift | 581 | 862 | 11 | 70 | 1,533 |
| Square yards | 450,986 | 658,830 | 15,690 | 211,379 | 1,336,885 |
| Runaround | 40 | 90 | | 45 | 175 |
| Square yards | 71,620 | 405,074 | | 40,000 | 517,294 |
| Stake | 110 | 1,340 | | 209 | 1,659 |
| Square yards | 35,819 | 161,823 | | 23,424 | 221,066 |
| Lines— | | | | | |
| Hand | 90 | 555 | 1 | 52 | 698 |
| Hooks | 128 | 793 | 1 | 104 | 1,026 |
| Trawl | 1,897 | 824 | | 14 | 2,735 |
| Hooks | 279,225 | 503,450 | | 6,100 | 788,775 |
| Troll | 20 | 304 | | | 324 |
| Hooks | 20 | 316 | | | 336 |
| Trot, with baits or snoods | | 4 | | 1 | 5 |
| Baits or snoods | | 1,775 | | 50 | 1,825 |
| Trot, with hooks | 15 | | | | 15 |
| Hooks | 2,640 | | | | 2,640 |

*Fisheries of the Middle Atlantic States, 1930*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Apparatus—Continued | | | | | |
| Pound nets | 418 | 181 | | 67 | 666 |
| Floating traps | 9 | | | | 9 |
| Wiers | | 83 | | | 83 |
| Stop nets | 18 | 60 | | 9 | 87 |
| Square yards | 13,170 | 34,704 | | 3,368 | 51,242 |
| Fyke nets | 2,412 | 1,772 | 30 | 320 | 4,534 |
| Dip nets | 65 | 36 | | 36 | 137 |
| Cast nets | | 4 | | 7 | 11 |
| Scap nets | 158 | | | | 158 |
| Drag nets | 18 | 6 | | | 24 |
| Yards at mouth | 32 | 17 | | | 49 |
| Push nets | 29 | | | | 29 |
| Otter trawls— | | | | | |
| Fish | 114 | 61 | | | 175 |
| Yards at mouth | 2,887 | 1,331 | | | 4,218 |
| Scallops | 1 | | | | 1 |
| Yards at mouth | 12 | | | | 12 |
| Shrimp | 1 | 3 | | | 4 |
| Yards at mouth | 30 | 72 | | | 102 |
| Pots— | | | | | |
| Crab | 54 | 4 | | | 58 |
| Eel | 4,391 | 5,299 | | 775 | 10,465 |
| Lobster | 17,841 | 33,920 | | 185 | 51,946 |
| Harpoons | 21 | | | | 21 |
| Spears | 139 | 60 | | 6 | 205 |
| Dredges— | | | | | |
| Clam | 16 | 56 | | 10 | 82 |
| Yards at mouth | 16 | 62 | | 10 | 88 |
| Crab | | 53 | | | 53 |
| Yards at mouth | | 59 | | | 59 |
| Mussel | 8 | | | | 8 |
| Yards at mouth | 10 | | | | 10 |
| Oyster | 105 | 537 | | 32 | 674 |
| Yards at mouth | 144 | 634 | | 39 | 817 |
| Scallop | 1,210 | 9 | | | 1,219 |
| Yards at mouth | 1,196 | 29 | | | 1,225 |
| Tongs | 605 | 868 | | 80 | 1,553 |
| Rakes | 455 | 667 | | 6 | 1,128 |
| Forks | 456 | 19 | | | 475 |
| Hoes | | 74 | | | 74 |
| Gaffs | | 32 | | 1 | 33 |

*Fisheries of the Middle Atlantic States, 1930*—Continued

CATCH: BY STATES

| Species | New York | | New Jersey | | Pennsylvania | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | | | |
| Albacore | 59,900 | $2,050 | 31,114 | $509 | | | | | 91,014 | $2,559 |
| Alewives | 631,694 | 10,053 | 1,464,122 | 15,928 | 2,000 | $100 | 3,193,966 | $9,742 | 5,291,782 | 35,823 |
| Bluefish | 821,080 | 77,657 | 2,961,744 | 312,662 | | | 31,010 | 2,314 | 3,813,834 | 392,633 |
| Bonito | 186,589 | 13,733 | 230,246 | 13,161 | | | | | 416,835 | 26,894 |
| Butterfish | 742,791 | 58,445 | 2,393,821 | 178,609 | | | | | 3,136,612 | 237,054 |
| Carp | 170,450 | 22,871 | 100,432 | 13,146 | 893 | 97 | 85,836 | 9,045 | 357,611 | 45,159 |
| Catfish and bullheads | 17,538 | 3,071 | 36,347 | 2,961 | 1,425 | 163 | 38,917 | 3,761 | 94,227 | 9,956 |
| Cero | | | 20,000 | 2,000 | | | | | 20,000 | 2,000 |
| Cod | 2,802,306 | 95,220 | 7,779,371 | 235,669 | | | 97,144 | 3,600 | 10,678,821 | 334,489 |
| Croaker | 325,000 | 8,125 | 1,439,807 | 50,493 | | | 1,124,930 | 28,704 | 2,889,737 | 87,322 |
| Cusk | | | 8,400 | 84 | | | | | 8,400 | 84 |
| Dolphin | | | 1,132 | 40 | | | | | 1,132 | 40 |
| Drum: | | | | | | | | | | |
| Black | | | 6,904 | 135 | | | | | 6,904 | 135 |
| Red or redfish | | | 64,924 | 11,656 | | | | | 64,924 | 11,656 |
| Eels | 637,477 | 77,378 | 539,749 | 58,608 | 865 | 200 | 93,589 | 10,996 | 1,271,680 | 147,182 |
| Flounders | 6,499,904 | 216,314 | 2,926,352 | 147,850 | | | 132,553 | 9,503 | 9,558,809 | 373,667 |
| Gizzard shad | | | | | | | 950 | 7 | 950 | 7 |
| Goosefish | | | 37,892 | 1,118 | | | | | 37,892 | 1,118 |
| Grayfish | 1,250 | 38 | 11,440 | 229 | | | | | 12,690 | 267 |
| Grunts | | | 150 | 6 | | | | | 150 | 6 |
| Haddock | 2,567,655 | 76,837 | 5,797 | 205 | | | | | 2,573,452 | 77,042 |
| Hagfish | | | 7,200 | 72 | | | | | 7,200 | 72 |
| Hake | 142,755 | 2,446 | 222,747 | 4,002 | | | | | 365,502 | 6,448 |
| Halibut | 4,895 | 968 | | | | | | | 4,895 | 968 |
| Herring, sea | 32,456 | 674 | 659,847 | 6,664 | | | | | 692,303 | 7,338 |
| King whiting or "kingfish" | 14,021 | 1,821 | 69,223 | 7,538 | | | 3,080 | 119 | 86,324 | 9,478 |
| Mackerel | 464,735 | 20,743 | 655,728 | 25,442 | | | | | 1,120,463 | 46,185 |
| Menhaden | 4,599,640 | 19,423 | 5,918,010 | 41,350 | | | 41,960,142 | 307,112 | 52,477,792 | 367,885 |
| Minnows | 147,694 | 4,438 | 18,000 | 220 | | | | | 165,694 | 4,658 |
| Mullet | | | 340 | 22 | | | 64,800 | 4,300 | 65,140 | 4,322 |
| Mummichog | 110,155 | 9,167 | 16,000 | 200 | | | | | 126,155 | 9,367 |
| Pike or pickerel | 705 | 108 | | | | | | | 705 | 108 |
| Pilotfish | | | 2,460 | 123 | | | | | 2,460 | 123 |
| Pollock | 111,430 | 2,787 | 2,964 | 111 | | | | | 114,394 | 2,898 |
| Rosefish | 1,375 | 41 | | | | | | | 1,375 | 41 |
| Scup or porgy | 1,089,581 | 31,257 | 7,564,041 | 183,266 | | | 27,000 | 2,160 | 8,680,622 | 216,683 |
| Sea bass | 319,751 | 24,468 | 3,546,149 | 134,360 | | | 20,250 | 1,620 | 3,886,150 | 160,448 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sea robin | 14,654 | 315 | 117,747 | 1,946 | | | | | 132,401 | 2,261 |
| Shad | 167,162 | 28,267 | 223,714 | 41,127 | 4,855 | 1,464 | 54,446 | 10,874 | 450,177 | 81,732 |
| Sharks | 450 | 23 | 176,469 | 3,795 | | | | | 176,919 | 3,818 |
| Silversides | 260,410 | 12,395 | | | | | | | 260,410 | 12,395 |
| Skates | 27,513 | 333 | 241,091 | 4,380 | | | | | 268,604 | 4,713 |
| Smelt | 3,100 | 868 | | | | | | | 3,100 | 868 |
| Snapper, red | | | 4,000 | 400 | | | | | 4,000 | 400 |
| Spanish mackerel | | | 15,839 | 1,496 | | | | | 15,839 | 1,496 |
| Spot | 3,878 | 309 | 542,616 | 22,645 | | | 146,761 | 8,250 | 693,255 | 31,204 |
| Squeteague or "sea trout," gray | 939,368 | 67,165 | 11,097,692 | 357,844 | | | 1,234,725 | 40,468 | 13,271,785 | 465,477 |
| Striped bass | 66,440 | 11,344 | 36,862 | 5,761 | | | 102,027 | 22,449 | 205,329 | 39,554 |
| Sturgeon | 2,110 | 610 | 4,208 | 1,787 | 182 | 182 | 15,313 | 6,253 | 21,813 | 8,832 |
| Suckers | 44,352 | 5,054 | 27,575 | 2,827 | 6,525 | 597 | 150 | 9 | 78,602 | 8,487 |
| Sunfish | 2,028 | 211 | | | | | | | 2,028 | 211 |
| Swordfish | 234,140 | 37,887 | | | | | | | 234,140 | 37,887 |
| Tautog | 82,177 | 6,196 | 181,966 | 6,115 | | | 74,000 | 2,300 | 338,143 | 14,611 |
| Thimble-eyed mackerel | | | 35,722 | 1,115 | | | | | 35,722 | 1,115 |
| Tilefish | 2,312,200 | 88,415 | | | | | | | 2,312,200 | 88,415 |
| Tomcod | 120,805 | 4,818 | | | | | | | 120,805 | 4,818 |
| Tuna or "horse mackerel" | 19,600 | 2,301 | 37,562 | 2,473 | | | | | 57,162 | 4,774 |
| Whitebait | 95,800 | 7,140 | | | | | | | 95,800 | 7,140 |
| White perch | 20,791 | 3,070 | 149,356 | 17,226 | | | 209,971 | 35,115 | 380,118 | 55,411 |
| Whiting | 349,267 | 10,367 | 3,763,942 | 59,568 | | | | | 4,113,209 | 69,935 |
| Wolffish | 6,425 | 113 | | | | | | | 6,425 | 113 |
| Yellow perch | 5,065 | 605 | 179,210 | 14,633 | | | 47,760 | 4,689 | 232,035 | 19,927 |
| Yellowtail | | | | | | | 2,940 | 84 | 2,940 | 84 |
| Total | 27,280,562 | 1,067,939 | 55,578,024 | 1,993,577 | 16,745 | 2,803 | 48,762,260 | 523,474 | 131,637,591 | 3,587,793 |
| SHELLFISH, ETC. | | | | | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | 165,144 | 8,716 | 252,056 | 20,307 | | | | | 417,200 | 29,023 |
| King | | | 5,215,800 | 27,548 | | | 968,760 | 1,265 | 6,184,560 | 28,813 |
| Rock | 640 | 80 | | | | | | | 640 | 80 |
| Soft | 5,576 | 1,704 | 105,824 | 15,173 | | | 23,800 | 4,850 | 135,200 | 21,727 |
| Lobsters | 536,391 | 136,692 | 1,010,579 | 230,110 | | | 11,750 | 2,620 | 1,558,720 | 369,422 |
| Shrimp | 95,530 | 14,318 | 245,526 | 14,485 | | | | | 341,056 | 28,803 |
| Squid | 533,984 | 21,757 | 1,239,524 | 33,019 | | | | | 1,773,508 | 54,776 |
| Clams: | | | | | | | | | | |
| Hard, public [1] | 793,656 | 358,302 | 1,561,556 | 648,098 | | | 18,503 | 3,790 | 2,373,715 | 1,010,190 |
| Hard, private [1] | 46,180 | 18,122 | 150,910 | 25,058 | | | 6,003 | 2,001 | 203,093 | 45,181 |
| Razor | 3,080 | 756 | | | | | | | 3,080 | 756 |
| Soft, public [2] | 501,975 | 70,448 | 628,628 | 87,808 | | | | | 1,130,603 | 158,256 |
| Soft, private [2] | 192 | 12 | | | | | | | 192 | 12 |
| Surf or skimmers | 291,270 | 34,639 | 131,670 | 15,281 | | | | | 422,940 | 49,920 |

[1] Statistics on hard clams used in this table are based on yields of 9 pounds of meats per bushel for those from public beds in New York, and 8 pounds for those from public beds in New Jersey and Delaware; 10 pounds for those from private beds in New York and New Jersey, and 8 pounds for those from private beds in Delaware. In reports for previous years all hard clams in these States have been computed on the basis of a uniform yield of 8 pounds of meats to the bushel.

[2] Statistics on soft clams used in this table are based on yields of 15 pounds of meats to the bushel in New York and 12 pounds in New Jersey. In reports for previous years all soft clams have been computed on the basis of a uniform yield of 10 pounds of meats to the bushel.

*Fisheries of the Middle Atlantic States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | New York | | New Jersey | | Pennsylvania | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC.—continued | | | | | | | | | | |
| Conchs | 35,226 | $2,945 | | | | | | | 35,226 | $2,945 |
| Mussels | 271,500 | 11,985 | 4,200 | $282 | | | 19,500 | $1,875 | 295,200 | 14,142 |
| Oysters: [1] | | | | | | | | | | |
| Market, public, spring | 8,767 | 2,166 | 37,602 | 5,671 | | | | | 46,369 | 7,837 |
| Market, public, fall | 7,521 | 1,858 | 121,226 | 16,613 | | | 166,467 | 18,942 | 295,214 | 37,413 |
| Market, private, spring | 4,741,779 | 1,123,278 | 3,656,171 | 587,952 | | | 28,120 | 3,967 | 8,426,070 | 1,715,197 |
| Market, private, fall | 4,505,158 | 1,045,663 | 8,009,996 | 1,238,752 | | | 233,513 | 32,002 | 12,748,667 | 2,316,417 |
| Seed, public, spring | 132,720 | 17,475 | 18,621,970 | 2,421,382 | | | 764,100 | 53,370 | 19,518,790 | 2,492,227 |
| Seed, public, fall | 96,215 | 13,460 | 82,804 | 9,959 | | | 75,374 | 4,501 | 254,393 | 27,920 |
| Seed, private, spring | 738,878 | 130,006 | 439,343 | 42,044 | | | | | 1,178,221 | 172,050 |
| Seed, private, fall | 2,854,610 | 381,550 | 4,000 | 300 | | | | | 2,858,610 | 381,850 |
| Scallops: | | | | | | | | | | |
| Bay | 396,711 | 115,274 | | | | | | | 396,711 | 115,274 |
| Sea | 1,338,462 | 230,746 | 164,100 | 33,342 | | | | | 1,502,562 | 264,088 |
| Terrapin, diamond-back | | | 6,041 | 7,052 | | | | | 6,041 | 7,052 |
| Turtles: | | | | | | | | | | |
| Loggerhead | | | 905 | 31 | | | | | 905 | 31 |
| Snapper | | | 7,430 | 581 | | | 2,650 | 138 | 10,080 | 719 |
| Bloodworms | 54,404 | 62,588 | | | | | | | 54,404 | 62,588 |
| Sandworms | 58,420 | 61,170 | | | | | | | 58,420 | 61,170 |
| Total | 18,213,989 | 3,865,710 | 41,697,861 | 5,480,848 | | | 2,318,540 | 129,321 | 62,230,390 | 9,475,879 |
| Grand total | 45,494,551 | 4,933,649 | 97,275,885 | 7,474,425 | 16,745 | $2,803 | 51,080,800 | 652,795 | 193,867,981 | 13,063,672 |

[1] Statistics on oysters used in this table are based on yields of 7 pounds of meats per bushel for market oysters in New York, 8.41 pounds for market oysters in New Jersey, and 7.5 pounds for market oysters in Delaware; and 7 pounds for seed oysters in New York, and 4.5 pounds for seed oysters in New Jersey and Delaware. In reports for previous years, all oysters in these States have been computed on the basis of a uniform yield of 7 pounds of meats to the bushel.

NOTE.—Of the above catch, all the cero and red snapper were taken off the coast of Florida. In addition, 45,000 pounds of shrimp, valued at $1,800, which were reported under New York, were taken off the coast of Florida; and 830 pounds of bluefish, valued at $123; 6,750 pounds of shad, valued at $900; 2,141 pounds of Spanish mackerel, valued at $145; and 222,658 pounds of shrimp, valued at $9,132 which were reported under New Jersey, were also taken off the coast of Florida.

*Fisheries of the Middle Atlantic States, 1930*—Continued

PRODUCTION OF CERTAIN SHELLFISH IN NUMBERS AND BUSHELS

| Product | New York | | New Jersey | | Delaware | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| Crabs: | | | | | | | | |
| Hard ... number | 495,432 | $8,716 | 756,168 | $20,307 | | | 1,251,600 | $29,023 |
| King ... do | | | 1,303,950 | 27,548 | 242,190 | $1,265 | 1,546,140 | 28,813 |
| Rock ... do | 1,920 | 80 | | | | | 1,920 | 80 |
| Soft ... do | 16,728 | 1,704 | 317,472 | 15,173 | 71,400 | 4,850 | 405,600 | 21,727 |
| Clams: | | | | | | | | |
| Hard, public ... bushels | 88,194 | 358,302 | 195,194 | 648,098 | 2,313 | 3,790 | 285,691 | 1,010,190 |
| Hard, private ... do | 4,618 | 18,122 | 15,091 | 25,058 | 750 | 2,001 | 20,459 | 45,181 |
| Soft, public ... do | 33,465 | 70,448 | 52,386 | 87,808 | | | 85,851 | 158,256 |
| Soft, private ... do | 13 | 12 | | | | | 13 | 12 |
| Surf or skimmers ... do | 24,272 | 34,639 | 10,972 | 15,281 | | | 35,244 | 49,920 |
| Conchs ... do | 1,957 | 2,945 | | | | | 1,957 | 2,945 |
| Mussels ... do | 27,150 | 11,985 | 420 | 282 | 1,950 | 1,875 | 29,520 | 14,142 |
| Oysters: | | | | | | | | |
| Market, public, spring ... bushels | 1,252 | 2,166 | 4,471 | 5,671 | | | 5,723 | 7,837 |
| Market, public, fall ... do | 1,074 | 1,858 | 14,415 | 16,613 | 22,196 | 18,942 | 37,685 | 37,413 |
| Market, private, spring ... bushels | 677,397 | 1,123,278 | 434,741 | 587,952 | 3,749 | 3,967 | 1,115,887 | 1,715,197 |
| Market, private, fall ... do | 643,594 | 1,045,663 | 952,437 | 1,238,752 | 31,135 | 32,002 | 1,627,166 | 2,316,417 |
| Seed, public, spring ... do | 18,960 | 17,475 | 4,138,216 | 2,421,382 | 169,800 | 53,370 | 4,326,970 | 2,492,227 |
| Seed, public, fall ... do | 13,745 | 13,460 | 18,401 | 9,959 | 16,750 | 4,501 | 48,896 | 27,920 |
| Seed, private, spring ... do | 105,554 | 130,006 | 97,632 | 42,044 | | | 203,186 | 172,050 |
| Seed, private, fall ... do | 407,801 | 381,550 | 889 | 300 | | | 408,690 | 381,850 |
| Scallops: | | | | | | | | |
| Bay ... do | 66,118 | 115,274 | | | | | 66,118 | 115,274 |
| Sea ... do | 223,077 | 230,746 | 27,350 | 33,342 | | | 250,427 | 264,088 |

*Industries related to the fisheries of the Middle Atlantic States, 1930*

| Item | New York | New Jersey | Pennsylvania | Delaware | Total |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged— | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 61 | 35 | | 5 | 101 |
| On boats | | 117 | | | 117 |
| Total | 61 | 152 | | 5 | 218 |
| Vessels— | | | | | |
| Motor | 24 | 10 | | 1 | 35 |
| Net tonnage | 357 | 159 | | 9 | 525 |
| Boats | | 176 | | | 176 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 246 | 124 | 56 | 18 | 444 |
| Persons engaged— | | | | | |
| Proprietors | 257 | 165 | 86 | 23 | 531 |
| Salaried employees | 677 | 141 | 124 | 22 | 964 |
| Wage earners: | | | | | |
| Average for season | 1,845 | 1,536 | 540 | 330 | 4,254 |
| Average for year | 1,686 | 929 | 453 | 130 | 3,198 |
| Salaries and wages paid | $5,420,042 | $1,242,574 | $1,163,278 | $130,186 | $7,956,080 |
| Products [1] | $8,987,601 | $3,649,260 | $2,027,205 | $757,259 | $15,421,325 |
| Fishermen's manufactured products: | | | | | |
| Persons engaged | 504 | 49 | | 39 | 592 |
| Products | $412,162 | $40,847 | | $7,104 | $460,113 |

[1] These production figures are not comparable with those shown in previous bulletins since packaged fresh and frozen fishery products are now included.

NOTE.—Of the total number of persons employed on transporting craft, 124 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 545 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## NEW YORK

*Fisheries of New York, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | | |
|---|---|---|---|---|---|---|---|
| | Menhaden | Other | | Anchor | Drift | Run-around | Stake |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 67 | 12 | | 2 | 37 | 16 | |
| On boats and shore— | | | | | | | |
| Regular | | | 151 | 36 | 18 | 45 | 40 |
| Casual | | | 186 | 33 | 203 | 6 | 71 |
| Total | 67 | 12 | 337 | 71 | 258 | 67 | 111 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | | | | 1 | | 5 | |
| 11 to 20 tons | 3 | | | | 1 | 1 | |
| 21 to 30 tons | 1 | 1 | | | 1 | | |
| 41 to 50 tons | | | | | 1 | | |
| 61 to 70 tons | | | | | 1 | | |
| Total | 4 | 1 | | 1 | 4 | 6 | |
| Net tonnage | 67 | 29 | | 7 | 142 | 51 | |
| Boats: | | | | | | | |
| Motor | | | 16 | 15 | 20 | 25 | 11 |
| Other | | | 133 | 18 | 97 | 10 | 83 |
| Accessory boats | 7 | 2 | | | 16 | 1 | |
| Apparatus: | | | | | | | |
| Number | 4 | 1 | 141 | 198 | 581 | 40 | 110 |
| Length, yards | 1,340 | 400 | 20,503 | | | | |
| Square yards | | | | 34,387 | 450,986 | 71,620 | 35,819 |

| Item | Lines | | | | Pound nets | Floating traps | Stop nets |
|---|---|---|---|---|---|---|---|
| | Hand | Trawl | Trot, with hooks | Troll | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 20 | 91 | | | 6 | | |
| On boats and shore— | | | | | | | |
| Regular | 37 | 134 | 2 | 7 | 142 | 10 | 7 |
| Casual | 16 | 7 | 16 | 2 | 12 | | 27 |
| Total | 73 | 232 | 18 | 9 | 160 | 10 | 34 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | 4 | 12 | | | 3 | | |
| 11 to 20 tons | | 4 | | | | | |
| 21 to 30 tons | 1 | 1 | | | | | |
| 41 to 50 tons | | 1 | | | | | |
| 51 to 60 tons | | 1 | | | | | |
| Total | 5 | 19 | | | 3 | | |
| Net tonnage | 53 | 264 | | | 18 | | |
| Boats: | | | | | | | |
| Motor | 41 | 55 | | 5 | 49 | 2 | 3 |
| Other | 12 | 9 | 15 | | 120 | 5 | 19 |
| Accessory boats | | 50 | | | | | |
| Apparatus: | | | | | | | |
| Number | 90 | 1,897 | 15 | 20 | 418 | 9 | 18 |
| Square yards | | | | | | | 13,170 |
| Hooks, baits, or snoods | 128 | 279,225 | 2,640 | 20 | | | |

*Fisheries of New York, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Fyke nets | Dip nets | Scap nets | Drag nets | Push nets | Otter trawls | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Fish | Scallop | Shrimp |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 9 | | | 2 | | 154 | 3 | 4 |
| On boats and shore— | | | | | | | | |
| Regular | 87 | 52 | 4 | 16 | 25 | 97 | | |
| Casual | 74 | 13 | 154 | 2 | 4 | 14 | | |
| Total | 170 | 65 | 158 | 20 | 29 | 265 | 3 | 4 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 5 | | | 1 | | 35 | | |
| 11 to 20 tons | | | | | | 10 | 1 | 1 |
| 21 to 30 tons | | | | | | 3 | | |
| 61 to 70 tons | | | | | | 1 | | |
| Total | 5 | | | 1 | | 49 | 1 | 1 |
| Net tonnage | 35 | | | 10 | | 555 | 13 | 12 |
| Sail—21 to 30 tons | | | | | | 1 | | |
| Net tonnage | | | | | | 27 | | |
| Total vessels | 5 | | | 1 | | 50 | 1 | 1 |
| Total net tonnage | 35 | | | 10 | | 582 | 13 | 12 |
| Boats: | | | | | | | | |
| Motor | 32 | 4 | | 2 | | 64 | | |
| Other | 103 | 52 | 96 | 12 | 24 | 2 | | |
| Accessory boats | 2 | | | | | | | |
| Apparatus: | | | | | | | | |
| Number | 2,412 | 65 | 158 | 18 | 29 | 114 | 1 | 1 |
| Yards at mouth | | | | 32 | | 2,887 | 12 | 30 |

| Item | Pots | | | Harpoons | Spears | Dredges | |
|---|---|---|---|---|---|---|---|
| | Crab | Eel | Lobster | | | Clam | Mussel |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 4 | 9 | 33 | | 14 | 18 |
| On boats and shore— | | | | | | | |
| Regular | 4 | 109 | 167 | 26 | 82 | 9 | |
| Casual | 2 | 34 | 22 | | 57 | 3 | |
| Total | 6 | 147 | 198 | 59 | 139 | 26 | 18 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | | 2 | 6 | 4 | | 6 | |
| 11 to 20 tons | | | | | | 1 | 3 |
| 21 to 30 tons | | | | 1 | | | 1 |
| 61 to 70 tons | | | | 1 | | | |
| Total | | 2 | 6 | 6 | | 7 | 4 |
| Net tonnage | | 16 | 42 | 115 | | 55 | 64 |
| Sail—21 to 30 tons | | | | 1 | | | |
| Net tonnage | | | | 27 | | | |
| Total vessels | | 2 | 6 | 7 | | 7 | 4 |
| Total net tonnage | | 16 | 42 | 142 | | 55 | 64 |
| Boats: | | | | | | | |
| Motor | 2 | 46 | 126 | 13 | 2 | 8 | |
| Other | 2 | 82 | 2 | 12 | 121 | | |
| Accessory boats | | | | 6 | | | |
| Apparatus: | | | | | | | |
| Number | 54 | 4,391 | 17,841 | 21 | 139 | 16 | 8 |
| Yards at mouth | | | | | | 16 | 10 |

*Fisheries of New York, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Dredges—Contd. | | Tongs | Rakes | Forks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Oyster | Scallop | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 221 | 152 | 57 | 2 | | | 707 |
| On boats and shore— | | | | | | | |
| Regular | 8 | 203 | 445 | 311 | 283 | 83 | 1,236 |
| Casual | 2 | 152 | 112 | 141 | 176 | 37 | 1,157 |
| Total | 231 | 507 | 614 | 454 | 459 | 120 | 3,100 |
| Vessels: | | | | | | | |
| Steam—31 to 40 tons | 1 | | | | | | 1 |
| Net tonnage | 36 | | | | | | 36 |
| Motor— | | | | | | | |
| 5 to 10 tons | 14 | 19 | 26 | 1 | | | 94 |
| 11 to 20 tons | 17 | 13 | | | | | 44 |
| 21 to 30 tons | 12 | 3 | | | | | 21 |
| 31 to 40 tons | 2 | | | | | | 2 |
| 41 to 50 tons | 2 | | | | | | 4 |
| 51 to 60 tons | 1 | | | | | | 2 |
| 61 to 70 tons | | | | | | | 1 |
| Total | 48 | 35 | 26 | 1 | | | 168 |
| Net tonnage | 882 | 407 | 164 | 6 | | | 2,275 |
| Sail— | | | | | | | |
| 5 to 10 tons | | 7 | 1 | | | | 8 |
| 11 to 20 tons | | 1 | | | | | 1 |
| 21 to 30 tons | | | | | | | 1 |
| Total | | 8 | 1 | | | | 10 |
| Net tonnage | | 55 | 6 | | | | 88 |
| Total vessels | 49 | 43 | 27 | 1 | | | 179 |
| Total net tonnage | 918 | 462 | 170 | 6 | | | 2,399 |
| Boats: | | | | | | | |
| Motor | 4 | 30 | 182 | 155 | | | 562 |
| Other | | 158 | 306 | 270 | 39 | 1 | 1,080 |
| Accessory boats | | | | | | | 79 |
| Apparatus: | | | | | | | |
| Number | 105 | 1,210 | 605 | 455 | 456 | | |
| Yards at mouth | 144 | 1,196 | | | | | |

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | Gill nets—Anchor | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 470,336 | $6,279 | | |
| Bluefish | | | | | 6,030 | 1,054 | 41,572 | $6,217 |
| Carp | | | | | 69,168 | 9,649 | 400 | 56 |
| Catfish and bullheads | | | | | 2,286 | 440 | 20 | 3 |
| Cod | | | | | 3,850 | 105 | | |
| Eels | | | | | 107,430 | 2,985 | | |
| Flounders | | | | | 5,300 | 530 | | |
| Menhaden | 4,475,640 | $18,183 | | | | | | |
| Minnows | | | | | 147,494 | 4,368 | | |
| Mummichog | | | | | 86,620 | 6,922 | | |
| Pike or pickerel | | | | | 400 | 54 | | |
| Scup or porgy | | | 500,000 | $7,500 | | | | |
| Sea robin | | | | | | | 400 | 10 |
| Shad | | | | | 1,148 | 223 | | |
| Silversides | | | | | 260,370 | 12,391 | | |
| Smelt | | | | | 2,500 | 750 | 50 | 20 |
| Squeteagues or "sea trout," gray | | | 200,000 | 5,000 | 33,350 | 5,283 | 84,247 | 11,563 |
| Striped bass | | | | | 41,380 | 8,548 | 2,011 | 497 |
| Sturgeon | | | | | 75 | 15 | 599 | 135 |
| Suckers | | | | | 10,087 | 1,017 | 875 | 90 |
| Sunfish | | | | | 661 | 72 | | |
| Whitebait | | | | | 95,800 | 7,140 | | |
| White perch | | | | | 3,170 | 664 | 2,849 | 282 |
| Yellow perch | | | | | 250 | 35 | | |
| Shrimp | | | | | 400 | 60 | | |
| Total | 4,475,640 | 18,183 | 700,000 | 12,500 | 1,348,105 | 68,584 | 133,023 | 18,873 |

*Fisheries of New York, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets—Continued | | | | | | Lines—Hand | |
|---|---|---|---|---|---|---|---|---|
| | Drift | | Runaround | | Stake | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 10,800 | $226 | | | 400 | $24 | | |
| Bluefish | 6,050 | 825 | 292,580 | $25,112 | 1,900 | 130 | 178,020 | $17,948 |
| Butterfish | | | 5,000 | 448 | | | | |
| Carp | 1,426 | 225 | | | 8,059 | 1,158 | | |
| Cod | | | | | | | 152,617 | 6,730 |
| Flounders | | | | | | | 30,450 | 522 |
| Hake | | | | | | | 9,000 | 110 |
| Mackerel | 195,460 | 6,088 | | | | | 8,500 | 510 |
| Pollock | | | | | | | 91,575 | 2,498 |
| Scup or porgy | | | | | 150 | 5 | 15,400 | 1,016 |
| Sea bass | | | | | | | 102,350 | 11,795 |
| Shad | 148,372 | 24,168 | | | 17,173 | 3,763 | | |
| Squeteagues or "sea trout," gray | 550 | 75 | 103,285 | 8,604 | 16,800 | 775 | 27,880 | 2,705 |
| Striped bass | | | 1,000 | 120 | 344 | 114 | 7,400 | 615 |
| Sturgeon | 1,211 | 401 | | | 225 | 59 | | |
| Suckers | | | | | 755 | 85 | | |
| Tautog | | | | | | | 26,100 | 1,980 |
| Tuna or "horse mackerel" | 220 | 15 | | | | | | |
| White perch | | | | | 1,483 | 155 | | |
| Total | 364,089 | 32,023 | 401,865 | 34,284 | 47,289 | 6,268 | 649,292 | 46,429 |

| Species | Lines—Continued | | | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Trot, with hooks | | Troll | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Albacore | | | | | | | 59,900 | $2,050 |
| Alewives | | | | | | | 89,950 | 1,041 |
| Bluefish | | | | | 4,980 | $542 | 289,748 | 25,814 |
| Bonito | | | | | | | 186,589 | 13,733 |
| Butterfish | | | | | | | 689,105 | 53,129 |
| Carp | | | 325 | $47 | | | | |
| Catfish and bullheads | | | 64 | 13 | | | | |
| Cod | 1,621,294 | $59,097 | | | | | 37,159 | 1,652 |
| Eels | 11,500 | 1,495 | 5,572 | 1,108 | | | 175,410 | 23,326 |
| Flounders | 300 | 30 | | | | | 263,892 | 10,431 |
| Grayfish | 1,250 | 38 | | | | | | |
| Haddock | 31,895 | 1,254 | | | | | | |
| Hake | 23,112 | 679 | | | | | | |
| Herring, sea | | | | | | | 32,456 | 674 |
| King whiting or "kingfish" | | | | | | | 13,976 | 1,817 |
| Mackerel | | | | | | | 239,300 | 13,022 |
| Menhaden | | | | | | | 124,000 | 1,240 |
| Scup or porgy | | | | | | | 391,445 | 19,928 |
| Sea bass | | | | | | | 48,886 | 4,753 |
| Sea robin | | | | | | | 11,139 | 243 |
| Shad | | | | | | | 283 | 48 |
| Sharks | | | | | | | 450 | 23 |
| Skates | 24,350 | 241 | | | | | 150 | 2 |
| Spot | | | | | | | 3,878 | 309 |
| Squeteagues or "sea trout," gray | | | | | | | 471,227 | 33,036 |
| Striped bass | | | | | | | 13,893 | 1,380 |
| Tautog | | | | | | | 38,035 | 3,037 |
| Tilefish | 2,312,200 | 88,415 | | | | | | |
| Tuna or "horse mackerel" | | | | | | | 19,380 | 2,286 |
| White perch | | | | | | | 750 | 25 |
| Whiting | | | | | | | 337,940 | 10,140 |
| Crabs, hard | | | | | | | 7,334 | 880 |
| Squid | | | | | | | 473,597 | 19,947 |
| Total | 4,025,901 | 151,249 | 5,961 | 1,168 | 4,980 | 542 | 4,019,872 | 243,966 |

*Fisheries of New York, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Floating traps | | Stop nets | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 234 | $7 | 19,067 | $250 | | |
| Butterfish | 45,686 | $4,569 | | | | | | |
| Carp | | | 44,450 | 6,189 | 7,663 | 871 | | |
| Catfish and bullheads | | | 1,800 | 225 | 12,791 | 2,300 | | |
| Cod | 496 | 27 | | | | | | |
| Eels | | | | | 3,860 | 614 | | |
| Flounders | 137,850 | 8,960 | | | 1,387,440 | 26,528 | | |
| Hake | 526 | 26 | | | | | | |
| King whiting or "kingfish" | 45 | 4 | | | | | | |
| Mackerel | 21,475 | 1,123 | | | | | | |
| Pike or pickerel | | | 53 | 5 | 90 | 21 | | |
| Pollock | 3,520 | 70 | | | | | | |
| Scup or porgy | 31,561 | 1,262 | | | | | | |
| Sea bass | 35,777 | 2,503 | | | | | | |
| Sea robin | 3,115 | 62 | | | | | | |
| Shad | | | 60 | 9 | | | | |
| Skates | 3,013 | 90 | | | | | | |
| Smelt | | | | | | | 200 | $10 |
| Squeteagues or "sea trout," gray | 509 | 74 | | | | | | |
| Striped bass | | | 200 | 60 | 12 | 1 | | |
| Suckers | | | 3,261 | 383 | 21,617 | 2,361 | | |
| Sunfish | | | 37 | 2 | 1,065 | 109 | | |
| Tautog | 1,157 | 57 | | | 7,900 | 766 | | |
| Tomcod | | | | | 120,678 | 4,799 | | |
| White perch | | | | | 10,356 | 1,779 | | |
| Whiting | 11,327 | 227 | | | | | | |
| Yellow perch | | | | | 3,931 | 463 | | |
| Crabs: | | | | | | | | |
| Hard | | | | | 36,975 | 1,110 | 43,100 | 3,774 |
| Soft | | | | | | | 5,576 | 1,704 |
| Shrimp | | | | | | | 510 | 50 |
| Squid | 60,387 | 1,810 | | | | | | |
| Scallops, bay | | | | | | | 11,130 | 2,340 |
| Total | 356,444 | 20,864 | 50,095 | 6,880 | 1,633,445 | 41,972 | 60,516 | 7,878 |

| Species | Scap nets | | Drag nets | | Push nets | | Otter trawls | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Fish | | Scallop | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 40,907 | $2,226 | | | | | | | | |
| Bluefish | | | | | | | 200 | $15 | | |
| Butterfish | | | | | | | 3,000 | 299 | | |
| Carp | 38,959 | 4,676 | | | | | | | | |
| Catfish and bullheads | 577 | 90 | | | | | | | | |
| Cod | | | | | | | 986,890 | 27,609 | | |
| Croaker | | | | | | | 325,000 | 8,125 | | |
| Eels | 117 | 22 | | | | | | | | |
| Flounders | | | | | | | 4,667,957 | 168,341 | | |
| Haddock | | | | | | | 2,535,760 | 75,583 | | |
| Hake | | | | | | | 110,117 | 1,631 | | |
| Halibut | | | | | | | 4,895 | 968 | | |
| Minnows | 200 | 70 | | | | | | | | |
| Mummichog | | | | | 40 | $4 | | | | |
| Pike or pickerel | 162 | 28 | | | | | | | | |
| Pollock | | | | | | | 16,335 | 219 | | |
| Rosefish | | | | | | | 1,375 | 41 | | |
| Scup or porgy | | | | | | | 151,025 | 1,546 | | |
| Sea bass | | | | | | | 31,688 | 1,756 | | |
| Shad | 126 | 56 | | | | | | | | |
| Silversides | | | | | 40 | 4 | | | | |
| Smelt | 350 | 88 | | | | | | | | |
| Squeteagues or "sea trout," gray | | | | | | | 1,520 | 50 | | |
| Striped bass | | | | | | | 200 | 9 | | |
| Suckers | 7,757 | 1,118 | | | | | | | | |
| Sunfish | 265 | 28 | | | | | | | | |
| Tautog | | | | | | | 8,985 | 356 | | |
| Tomcod | 127 | 19 | | | | | | | | |
| White perch | 2,183 | 165 | | | | | | | | |
| Wolffish | | | | | | | 6,425 | 113 | | |
| Yellow perch | 884 | 107 | | | | | | | | |
| Crabs, hard | | | 67,500 | $2,025 | | | | | | |
| Lobsters | | | | | | | 400 | 120 | | |
| Shrimp | | | 49,600 | 12,400 | 20 | 8 | | | | |
| Clams, soft, private | | | | | | | 192 | 12 | | |
| Conchs | | | | | | | 1,710 | 152 | | |
| Scallops: | | | | | | | | | | |
| Bay | | | | | 23,580 | 4,840 | | | | |
| Sea | | | 7,902 | 1,756 | | | | | 13,500 | $1,875 |
| Total | 92,614 | 8,693 | 125,002 | 16,181 | 23,680 | 4,856 | 8,853,674 | 286,945 | 13,500 | 1,875 |

*Fisheries of New York, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Otter trawls—Shrimp | | Pots | | | | | | Harpoons | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Eel | | Lobster | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | | | | | 267,664 | $36,921 | | | | |
| Flounders | | | | | 1,400 | 262 | | | | |
| Mummichog | | | | | 23,495 | 2,241 | | | | |
| Sea bass | | | | | | | 101,050 | $3,661 | | |
| Swordfish | | | | | | | | | 234,140 | $37,887 |
| Crabs: | | | | | | | | | | |
| Hard | | | 5,685 | $753 | | | 3,650 | 165 | | |
| Rock | | | | | 640 | 80 | | | | |
| Lobsters | | | | | | | 535,991 | 136,572 | | |
| Shrimp | 45,000 | $1,800 | | | | | | | | |
| Total | 45,000 | 1,800 | 5,685 | 753 | 293,199 | 39,504 | 640,691 | 140,398 | 234,140 | 37,887 |

| Species | Spears | | Dredges | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Clam | | Mussel | | Oyster | | Scallop | |
| | *Lbs.* | *Value* | *Lbs.* | *Value* | *Lbs.* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | 65,924 | $10,907 | | | | | | | | |
| Flounders | 5,315 | 710 | | | | | | | | |
| Clams: | | | | | | | | | | |
| Hard, private | | | | | | | 1,200 | $500 | | |
| Surf or skimmers | | | 224,950 | $18,340 | | | | | | |
| Conchs | | | | | | | | | 33,516 | $2,793 |
| Mussels | | | | | 235,400 | $10,762 | 21,600 | 648 | | |
| Oysters: | | | | | | | | | | |
| Market, private, spring | | | | | | | 4,703,979 | 1,111,178 | | |
| Market, private, fall | | | | | | | 4,456,998 | 1,030,107 | | |
| Seed, public, fall | | | | | | | 4,200 | 450 | | |
| Seed, private, spring | | | | | | | 738,878 | 130,006 | | |
| Seed, private, fall | | | | | | | 2,854,610 | 381,550 | | |
| Scallops: | | | | | | | | | | |
| Bay | | | | | | | | | 357,633 | 106,763 |
| Sea | | | | | | | | | 1,317,060 | 227,115 |
| Total | 71,239 | 11,617 | 224,950 | 18,340 | 235,400 | 10,762 | 12,781,465 | 2,654,439 | 1,708,209 | 336,671 |

| Species | Tongs | | Rakes | | Forks | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, hard | 200 | $2 | 700 | $7 | | | | |
| Clams: | | | | | | | | |
| Hard, public | 382,588 | 165,015 | 371,220 | 175,191 | | | 39,848 | $18,096 |
| Hard, private | 44,980 | 17,622 | | | | | | |
| Razor | | | | | 3,080 | $756 | | |
| Soft, public | | | 137,250 | 13,088 | 364,725 | 57,360 | | |
| Surf or skimmers | 66,320 | 16,299 | | | | | | |
| Mussels | 6,500 | 325 | | | | | 8,000 | 250 |
| Oysters: | | | | | | | | |
| Market, public, spring | 8,767 | 2,166 | | | | | | |
| Market, public, fall | 7,521 | 1,858 | | | | | | |
| Market, private, spring | 37,800 | 12,100 | | | | | | |
| Market, private, fall | 48,160 | 15,550 | | | | | | |
| Seed, public, spring | 62,720 | 8,975 | 70,000 | 8,500 | | | 11,900 | 1,635 |
| Seed, public, fall | 67,515 | 9,675 | 12,600 | 1,700 | | | 2,100 | 642 |
| Scallops, bay | | | 2,268 | 689 | | | | |
| Bloodworms | | | | | 54,404 | 62,588 | | |
| Sandworms | | | | | 58,420 | 61,170 | | |
| Total | 733,071 | 249,593 | 594,038 | 199,175 | 480,629 | 181,874 | 61,848 | 20,623 |

*Fisheries of New York, 1930*—Continued

OPERATING UNITS: BY COUNTIES

| Item | Albany | Bronx | Columbia | Dutchess | Greene | Kings | Nassau | New York | Orange |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | 148 | 46 | 130 | |
| On boats and shore— | | | | | | | | | |
| Regular | | | 2 | 2 | 2 | 187 | 215 | | 2 |
| Casual | 10 | 2 | 32 | 104 | 35 | 109 | 137 | | 41 |
| Total | 10 | 2 | 34 | 106 | 37 | 444 | 398 | 130 | 43 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | | | | | 22 | 3 | 4 | |
| 11 to 20 tons | | | | | | 8 | 6 | 6 | |
| 21 to 30 tons | | | | | | 5 | 2 | 5 | |
| 31 to 40 tons | | | | | | | | 1 | |
| 41 to 50 tons | | | | | | | | 2 | |
| 51 to 60 tons | | | | | | | | 1 | |
| 61 to 70 tons | | | | | | | | 1 | |
| Total | | | | | | 35 | 11 | 20 | |
| Net tonnage | | | | | | 403 | 164 | 489 | |
| Sail—21 to 30 tons | | | | | | 1 | | | |
| Net tonnage | | | | | | 27 | | | |
| Total vessels | | | | | | 36 | 11 | 20 | |
| Total net tonnage | | | | | | 430 | 164 | 489 | |
| Boats: | | | | | | | | | |
| Motor | | | | 6 | | 91 | 34 | | 1 |
| Other | 7 | 2 | 19 | 44 | 27 | 8 | 205 | | 21 |
| Accessory boats | | | | | | 6 | 1 | 57 | |
| Apparatus: | | | | | | | | | |
| Purse seines— | | | | | | | | | |
| Other | | | | | | 1 | | | |
| Length, yards | | | | | | 400 | | | |
| Haul seines | 2 | | 6 | 5 | 7 | 5 | 18 | | 10 |
| Length, yards | 216 | | 602 | 631 | 707 | 65 | 996 | | 1,220 |
| Gill nets— | | | | | | | | | |
| Drift | | | 1 | 31 | 1 | | 50 | 420 | 9 |
| Square yards | | | 2,000 | 96,670 | 1,050 | | 40,400 | 75,600 | 26,988 |
| Runaround | | | | | | | 18 | | |
| Square yards | | | | | | | 37,700 | | |
| Stake | | | | 1 | 1 | | | | |
| Square yards | | | | 800 | 66 | | | | |
| Lines— | | | | | | | | | |
| Hand | | | | | | 38 | | 6 | |
| Hooks | | | | | | 66 | | 12 | |
| Trawl | | | | | | 68 | 23 | 40 | |
| Hooks | | | | | | 79,000 | 48,425 | 60,900 | |
| Trot, with hooks | | | | 3 | | | | | 1 |
| Hooks | | | | 710 | | | | | 150 |
| Troll | | | | | | 16 | | | |
| Hooks | | | | | | 16 | | | |
| Pound nets | | | | | | | 4 | | |
| Stop nets | | | 2 | 2 | 3 | | | | 1 |
| Square yards | | | 1,525 | 2,017 | 3,464 | | | | 498 |
| Fyke nets | 22 | | 33 | 55 | 37 | | | | 52 |
| Dip nets | | | | | | | 22 | | |
| Scap nets | 5 | | 12 | 35 | 16 | | | | 12 |
| Drag nets | | | | | | | 3 | | |
| Yards at mouth | | | | | | | 5 | | |
| Push nets | | | | | | | 1 | | |
| Otter trawls— | | | | | | | | | |
| Fish | | | | | | 30 | 4 | 4 | |
| Yards at mouth | | | | | | 649 | 87 | 125 | |
| Shrimp | | | | | | | 1 | | |
| Yards at mouth | | | | | | | 30 | | |
| Pots— | | | | | | | | | |
| Crab | | | | | | 36 | | | |
| Eel | | | | 3 | | 112 | 440 | | 15 |
| Lobster | | | | | | 6,933 | 3,655 | | |
| Harpoons | | | | | | 1 | | 2 | |
| Spears | | | | | | 11 | 55 | | |
| Dredges— | | | | | | | | | |
| Clam | | | | | | 15 | | | |
| Yards at mouth | | | | | | 15 | | | |
| Mussel | | | | | | | 6 | | |
| Yards at mouth | | | | | | | 7 | | |
| Oyster | | | | | | | 17 | 18 | |
| Yards at mouth | | | | | | | 20 | 27 | |
| Scallop | | | | | | 30 | 6 | 4 | |
| Yards at mouth | | | | | | 82 | 16 | 11 | |
| Tongs | | 2 | | | | | 182 | | |
| Rakes | | | | | | | 70 | | |
| Forks | | | | | | 125 | 143 | | |

*Fisheries of New York, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Putnam | Queens | Rensselaer | Richmond | Rockland | Saratoga | Suffolk | Ulster | Westchester |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | 2 | | 2 | | | 376 | | 3 |
| On boats and shore— | | | | | | | | | |
| Regular | | | | 6 | | | 809 | 4 | 7 |
| Casual | 1 | 2 | 18 | 6 | 44 | 3 | 409 | 146 | 58 |
| Total | 1 | 4 | 18 | 14 | 44 | 3 | 1,594 | 150 | 68 |
| Vessels: | | | | | | | | | |
| Steam—31 to 40 tons | | | | | | | 1 | | |
| Net tonnage | | | | | | | 36 | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | | | 1 | | | 63 | | 1 |
| 11 to 20 tons | | 1 | | | | | 23 | | |
| 21 to 30 tons | | | | | | | 9 | | |
| 31 to 40 tons | | | | | | | 1 | | |
| 41 to 50 tons | | | | | | | 2 | | |
| 51 to 60 tons | | | | | | | 1 | | |
| Total | | 1 | | 1 | | | 99 | | 1 |
| Net tonnage | | 16 | | 7 | | | 1,188 | | 8 |
| Sail— | | | | | | | | | |
| 5 to 10 tons | | | | | | | 8 | | |
| 11 to 20 tons | | | | | | | 1 | | |
| Total | | | | | | | 9 | | |
| Net tonnage | | | | | | | 61 | | |
| Total vessels | | 1 | | 1 | | | 109 | | 1 |
| Total net tonnage | | 16 | | 7 | | | 1,285 | | 8 |
| Boats: | | | | | | | | | |
| Motor | | | | 8 | 4 | | 410 | 4 | 4 |
| Other | 1 | 1 | 15 | | 21 | 3 | 597 | 78 | 31 |
| Accessory boats | | | | | | | 15 | | |
| Apparatus: | | | | | | | | | |
| Purse seines— | | | | | | | | | |
| Menhaden | | | | | | | 4 | | |
| Length, yards | | | | | | | 1,340 | | |
| Haul seines | | 1 | 3 | 1 | 3 | | 69 | 5 | 6 |
| Length, yards | | 100 | 534 | 5 | 600 | | 13,486 | 542 | 799 |
| Gill nets— | | | | | | | | | |
| Anchor | | | | | 27 | | 38 | 10 | 123 |
| Square yards | | | | | 460 | | 32,129 | 100 | 1,698 |
| Drift | | | | | 7 | | 4 | 47 | 11 |
| Square yards | | | | | 21,010 | | 7,200 | 137,536 | 42,532 |
| Runaround | | | | | | | 22 | | |
| Square yards | | | | | | | 33,920 | | |
| Stake | | | | | 10 | | 67 | 18 | 13 |
| Square yards | | | | | 5,843 | | 13,280 | 2,887 | 12,943 |
| Lines— | | | | | | | | | |
| Hand | | | | | | | 46 | | |
| Hooks | | | | | | | 50 | | |
| Trawl | | | | | | | 1,766 | | |
| Hooks | | | | | | | 90,900 | | |
| Trot, with hooks | 1 | | 1 | | 4 | | | 4 | 1 |
| Hooks | 150 | | 60 | | 760 | | | 510 | 300 |
| Troll | | | | | | | 4 | | |
| Hooks | | | | | | | 4 | | |
| Pound nets | | | | | | | 414 | | |
| Floating traps | | | | | | | 9 | | |
| Stop nets | 1 | | | | | | | 8 | 1 |
| Square yards | 66 | | | | | | | 5,201 | 399 |
| Fyke nets | | | 23 | | 2 | | 2,089 | 66 | 33 |
| Dip nets | | | | | | | 43 | | |
| Scap nets | | | 12 | | 1 | 3 | | 61 | 1 |
| Drag nets | | | | | | | 15 | | |
| Yards at mouth | | | | | | | 27 | | |
| Push nets | | | | | | | 28 | | |
| Otter trawls— | | | | | | | | | |
| Fish | | 1 | | 1 | | | 74 | | |
| Yards at mouth | | 30 | | 19 | | | 1,977 | | |
| Scallop | | | | | | | 1 | | |
| Yards at mouth | | | | | | | 12 | | |
| Pots— | | | | | | | | | |
| Crab | | | | | 18 | | | | |
| Eel | 2 | | | | 35 | | 3,718 | 8 | 58 |
| Lobster | | | | 1,150 | | | 6,085 | | 18 |

*Fisheries of New York, 1930*—Continued

OPERATING UNITS: By counties—Continued

| Item | Putnam | Queens | Rensselaer | Richmond | Rockland | Saratoga | Suffolk | Ulster | Westchester |
|---|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Harpoons | | | | | | | 17 | | 1 |
| Spears | | | | | | | 72 | | 1 |
| Dredges— | | | | | | | | | |
| Clam | | | | 1 | | | | | |
| Yards at mouth | | | | 1 | | | | | |
| Mussel | | | | | | | 2 | | |
| Yards at mouth | | | | | | | 3 | | |
| Oyster | | | | | | | 70 | | |
| Yards at mouth | | | | | | | 97 | | |
| Scallop | | | | 2 | | | 1,168 | | |
| Yards at mouth | | | | 4 | | | 1,083 | | |
| Tongs | | | | | | | 418 | | 3 |
| Rakes | | | | | | | 384 | | 1 |
| Forks | | | | 4 | | | 184 | | |

CATCH: By counties

| Species | Albany | | Bronx | | Columbia | | Dutchess | | Greene | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 3,500 | $145 | | | 33,560 | $1,135 | 9,510 | $585 | 8,935 | $404 |
| Carp | 3,880 | 392 | | | 26,220 | 3,104 | 9,507 | 1,223 | 20,641 | 2,798 |
| Catfish and bullheads | 150 | 23 | | | 3,371 | 625 | 1,880 | 409 | 6,026 | 862 |
| Eels | | | | | 200 | 40 | 3,844 | 737 | 100 | 13 |
| Minnows | | | | | | | | | 100 | 20 |
| Pike or pickerel | 495 | 70 | | | | | 15 | 4 | | |
| Shad | | | | | 947 | 120 | 49,164 | 8,506 | 230 | 59 |
| Striped bass | | | | | | | 282 | 56 | | |
| Sturgeon | | | | | | | 700 | 210 | | |
| Suckers | 3,190 | 291 | | | 8,608 | 872 | 2,937 | 398 | 1,461 | 154 |
| Sunfish | | | | | 20 | 2 | 660 | 72 | | |
| Tomcod | | | | | 100 | 15 | | | | |
| White perch | | | | | | | 408 | 47 | | |
| Yellow perch | | | | | 3,085 | 339 | 584 | 103 | 186 | 24 |
| Clams, hard, public | | | 160 | $120 | | | | | | |
| Total | 11,215 | 921 | 160 | 120 | 76,111 | 6,252 | 79,491 | 12,350 | 37,679 | 4,334 |

| Species | Kings | | Nassau | | New York | | Orange | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | | | | | 2,130 | $131 |
| Bluefish | 156,360 | $14,269 | 137,835 | $9,663 | | | | |
| Butterfish | | | 5,000 | 448 | 3,000 | $299 | | |
| Carp | | | | | | | 15,858 | 2,208 |
| Catfish and bullheads | | | | | | | 1,327 | 272 |
| Cod | 972,975 | 31,526 | 309,735 | 10,488 | 449,820 | 11,203 | | |
| Croaker | 325,000 | 8,125 | | | | | | |
| Eels | 17,600 | 2,288 | 45,980 | 7,578 | | | 1,957 | 375 |
| Flounders | 695,750 | 23,274 | 141,950 | 6,852 | 370,177 | 12,160 | | |
| Haddock | 661,150 | 20,655 | | | 1,677,030 | 46,295 | | |
| Hake | 64,650 | 963 | 770 | 21 | 55,117 | 721 | | |
| Halibut | 1,700 | 340 | | | 3,195 | 628 | | |
| Mackerel | | | 43,350 | 1,018 | 152,110 | 5,070 | | |
| Minnows | | | | | | | 194 | 68 |
| Mummichog | 26,100 | 3,905 | 23,855 | 2,244 | | | | |
| Pollock | | | | | 16,335 | 219 | | |
| Rosefish | | | | | 1,375 | 41 | | |
| Scup or porgy | 656,500 | 9,325 | 250 | 15 | | | | |
| Sea bass | 46,500 | 3,430 | 98,550 | 3,355 | 550 | 55 | | |
| Shad | | | | | | | 9,328 | 2,021 |
| Silversides | 1,050 | 63 | 20,035 | 2,807 | | | | |
| Skates | | | 600 | 3 | | | | |
| Squeteagues or "sea trout," gray | 201,000 | 5,018 | 26,250 | 1,601 | | | | |
| Striped bass | | | 7,600 | 1,900 | | | 235 | 47 |
| Suckers | | | | | | | 8,575 | 1,095 |

*Fisheries of New York, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Kings | | Nassau | | New York | | Orange | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Swordfish | 44,610 | $7,969 | | | 90,080 | $16,061 | | |
| Tautog | 22,500 | 1,575 | | | 600 | 60 | | |
| Tilefish | 346,900 | 19,103 | | | 1,965,300 | 69,312 | | |
| Tuna or "horse mackerel" | | | | | 220 | 15 | | |
| White perch | | | | | | | 570 | $72 |
| Wolffish | | | | | 6,425 | 113 | | |
| Crabs: | | | | | | | | |
| Hard | 3,685 | 503 | 3,400 | $129 | | | | |
| Rock | | | 640 | 80 | | | | |
| Soft | | | 2,480 | 930 | | | | |
| Lobsters | 295,850 | 68,020 | 52,400 | 16,487 | | | | |
| Shrimp | | | 46,120 | 2,083 | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | 195,944 | 85,609 | | | | |
| Hard, private | | | 400 | 200 | | | | |
| Razor | | | 3,080 | 756 | | | | |
| Soft, public | 17,700 | 2,360 | 139,350 | 23,000 | | | | |
| Soft, private | 192 | 12 | | | | | | |
| Surf or skimmers | 203,350 | 16,315 | 9,000 | 1,069 | | | | |
| Conchs | 25,650 | 2,147 | | | | | | |
| Mussels | 8,000 | 250 | 197,500 | 8,435 | | | | |
| Oysters: | | | | | | | | |
| Market, public, fall | | | 14 | 4 | | | | |
| Market, private, spring | | | 431,900 | 114,450 | 721,497 | 103,057 | | |
| Market, private, fall | | | 393,792 | 91,901 | 744,198 | 106,314 | | |
| Seed, public, fall | | | 7,700 | 825 | | | | |
| Seed, private, spring | | | | | 14,000 | 2,000 | | |
| Seed, private, fall | | | 550,000 | 60,000 | 2,187,010 | 303,000 | | |
| Scallops: | | | | | | | | |
| Bay | | | 6,048 | 1,833 | | | | |
| Sea | 805,434 | 145,343 | 153,000 | 25,500 | 82,500 | 13,800 | | |
| Bloodworms | 28,110 | 29,454 | 14,839 | 18,096 | | | | |
| Sandworms | 28,110 | 29,454 | 3,708 | 3,798 | | | | |
| Total | 5,056,426 | 445,086 | 3,073,075 | 504,078 | 8,540,539 | 690,423 | 40,174 | 6,289 |

| Species | Putnam | | Queens | | Rennselaer | | Richmond | | Rockland | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | | | 4,452 | $182 | | | 12 | $1 |
| Carp | 210 | $31 | 100 | $12 | 10,242 | 1,168 | | | 7,100 | 790 |
| Catfish and bullheads | | | | | 1,989 | 364 | | | 69 | 13 |
| Eels | 495 | 86 | | | 631 | 158 | | | 2,376 | 281 |
| Flounders | | | 90,000 | 1,350 | | | 36,547 | $1,462 | | |
| Minnows | | | | | 100 | 50 | | | | |
| Mummichog | | | | | | | 1,500 | 300 | | |
| Pike or pickerel | 53 | 5 | | | 52 | 8 | | | | |
| Shad | | | | | 55 | 15 | | | 6,234 | 1,391 |
| Striped bass | | | | | | | | | 820 | 219 |
| Sturgeon | | | | | | | | | 71 | 17 |
| Suckers | | | | | 2,731 | 292 | | | 2,125 | 212 |
| Sunfish | | | | | 179 | 18 | | | | |
| White perch | | | | | | | | | 1,016 | 123 |
| Yellow perch | | | | | 5 | 1 | | | | |
| Crabs: Hard | | | | | | | 3,650 | 165 | 2,000 | 250 |
| Lobsters | | | | | | | 22,000 | 5,505 | | |
| Clams, surf or skimmers | | | | | | | 21,600 | 2,025 | | |
| Conchs | | | | | | | 9,576 | 798 | | |
| Sandworms | | | | | | | 300 | 300 | | |
| Total | 758 | 122 | 90,100 | 1,362 | 20,436 | 2,256 | 95,173 | 10,555 | 21,823 | 3,297 |

*Fisheries of New York, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Saratoga | | Suffolk | | Ulster | | Westchester | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Albacore | | | 59,900 | $2,050 | | | | |
| Alewives | | | 540,450 | 6,266 | 28,690 | $1,179 | 455 | $25 |
| Bluefish | | | 526,885 | 53,725 | | | | |
| Bonito | | | 186,589 | 13,733 | | | | |
| Butterfish | | | 734,791 | 57,698 | | | | |
| Carp | 1,290 | $153 | 20,250 | 3,225 | 45,178 | 6,455 | 9,974 | 1,312 |
| Catfish and bullheads | 50 | 5 | | | 1,223 | 264 | 1,453 | 234 |
| Cod | | | 1,069,776 | 42,003 | | | | |
| Eels | | | 551,063 | 64,298 | 966 | 153 | 12,265 | 1,371 |
| Flounders | | | 5,165,480 | 171,216 | | | | |
| Grayfish | | | 1,250 | 38 | | | | |
| Haddock | | | 229,475 | 9,887 | | | | |
| Hake | | | 22,218 | 741 | | | | |
| Herring, sea | | | 32,456 | 674 | | | | |
| King whiting or "kingfish" | | | 14,021 | 1,821 | | | | |
| Mackerel | | | 269,275 | 14,655 | | | | |
| Menhaden | | | 4,599,640 | 19,423 | | | | |
| Minnows | | | 147,000 | 4,200 | 300 | 100 | | |
| Mummichog | | | 58,700 | 2,718 | | | | |
| Pike or pickerel | | | | | 50 | 10 | 40 | 11 |
| Pollock | | | 95,095 | 2,568 | | | | |
| Scup or porgy | | | 432,831 | 21,917 | | | | |
| Sea bass | | | 174,151 | 17,628 | | | | |
| Sea robin | | | 14,654 | 315 | | | | |
| Shad | | | 2,158 | 579 | 77,831 | 11,231 | 21,215 | 4,345 |
| Sharks | | | 450 | 23 | | | | |
| Silversides | | | 239,325 | 9,525 | | | | |
| Skates | | | 26,913 | 330 | | | | |
| Smelt | | | 2,750 | 780 | 350 | 88 | | |
| Spot | | | 3,878 | 309 | | | | |
| Squeteagues or "sea trout," gray | | | 712,118 | 60,546 | | | | |
| Striped bass | | | 56,593 | 8,878 | | | 910 | 244 |
| Sturgeon | | | | | 511 | 191 | 828 | 192 |
| Suckers | 1,175 | 135 | | | 6,710 | 774 | 6,840 | 831 |
| Sunfish | | | | | 747 | 68 | 422 | 51 |
| Swordfish | | | 91,450 | 12,950 | | | 8,000 | 907 |
| Tautog | | | 59,077 | 4,561 | | | | |
| Tomcod | | | 120,050 | 4,751 | 155 | 17 | 500 | 35 |
| Tuna or "horse mackerel" | | | 19,380 | 2,286 | | | | |
| Whitebait | | | 95,800 | 7,140 | | | | |
| White perch | | | 12,000 | 2,220 | 2,457 | 186 | 4,340 | 422 |
| Whiting | | | 349,267 | 10,367 | | | | |
| Yellow perch | | | | | 1,205 | 138 | | |
| Crabs: | | | | | | | | |
| Hard | | | 152,409 | 7,669 | | | | |
| Soft | | | 3,096 | 774 | | | | |
| Lobsters | | | 165,916 | 46,590 | | | 225 | 90 |
| Shrimp | | | 49,410 | 12,235 | | | | |
| Squid | | | 533,984 | 21,757 | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | 591,408 | 269,743 | | | 6,144 | 2,830 |
| Hard, private | | | 45,780 | 17,922 | | | | |
| Soft, public | | | 344,925 | 45,088 | | | | |
| Surf or skimmers | | | 57,320 | 14,330 | | | | |
| Mussels | | | 66,000 | 3,300 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 8,767 | 2,166 | | | | |
| Market, public, fall | | | 7,507 | 1,854 | | | | |
| Market, private, spring | | | 3,588,382 | 905,771 | | | | |
| Market, private, fall | | | 3,367,168 | 847,448 | | | | |
| Seed, public, spring | | | 132,720 | 17,475 | | | | |
| Seed, public, fall | | | 88,515 | 12,635 | | | | |
| Seed, private, spring | | | 724,878 | 128,006 | | | | |
| Seed, private, fall | | | 117,600 | 18,550 | | | | |
| Scallops: | | | | | | | | |
| Bay | | | 390,663 | 113,441 | | | | |
| Sea | | | 297,528 | 46,103 | | | | |
| Bloodworms | | | 11,455 | 15,038 | | | | |
| Sandworms | | | 26,302 | 27,618 | | | | |
| Total | 2,515 | 293 | 27,508,892 | 3,211,557 | 166,373 | 20,854 | 73,611 | 12,900 |

*Industries related to the fisheries of New York, 1930*

TRANSPORTING

| Item | Nassau County | Suffolk County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 15 | 46 | 61 |
| Vessels, motor— | | | |
| 5 to 10 tons | 1 | 13 | 14 |
| 11 to 20 tons | 1 | 2 | 3 |
| 21 to 30 tons | | 3 | 3 |
| 31 to 40 tons | 2 | 2 | 4 |
| Total | 4 | 20 | 24 |
| Net tonnage | 93 | 264 | 357 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Albany, Dutchess, and Orange Counties | Bronx County | Kings and Queens Counties | Nassau County | New York County | Suffolk County | Total |
|---|---|---|---|---|---|---|---|
| Establishments | 5 | 4 | 22 | 11 | 178 | 26 | 246 |
| Persons engaged: | | | | | | | |
| Proprietors | 4 | 6 | 23 | 13 | 187 | 24 | 257 |
| Salaried employees | 12 | 10 | 51 | 6 | 579 | 19 | 677 |
| Wage earners— | | | | | | | |
| Average for season | 125 | 34 | 152 | 40 | 1,209 | 285 | 1,845 |
| Average for year | 124 | 34 | 146 | 26 | 1,159 | 197 | 1,686 |
| Paid to salaried employees | $45,893 | $62,750 | $203,703 | $9,600 | $2,166,945 | $61,930 | $2,550,821 |
| Paid to wage earners | 85,396 | 58,660 | 254,517 | 29,420 | 2,187,755 | 253,473 | 2,869,221 |
| Total salaries and wages | 131,289 | 121,410 | 458,220 | 39,020 | 4,354,700 | 315,403 | 5,420,042 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Buffalofish, smoked | pounds | 742,452 | $312,043 |
| Butterfish, smoked | do | 565,548 | 168,355 |
| Chubs, smoked | do | 1,096,923 | 374,444 |
| Ciscoes, smoked | do | 1,133,405 | 445,501 |
| Cod, fresh fillets | do | 1,842,400 | 297,591 |
| Eels, smoked | do | 2,531 | 868 |
| Flounders, fresh fillets | do | 254,000 | 58,170 |
| Haddock: | | | |
| Fresh fillets | do | 3,103,463 | 535,925 |
| Smoked fillets | do | 106,500 | 24,300 |
| Finnan haddie | do | 755,500 | 93,622 |
| Hake, fresh fillets | do | 147,000 | 19,777 |
| Herring, sea, smoked | do | 176,951 | 33,949 |
| Lake trout, smoked | do | 48,683 | 15,183 |
| Mackerel, smoked | do | 133,181 | 22,988 |
| Salmon, smoked | do | 5,081,491 | 1,918,417 |
| Shad, smoked | do | 61,859 | 12,441 |
| Sturgeon: | | | |
| Smoked | do | 1,846,724 | 1,386,646 |
| Caviar, canned | standard cases | 7,993 | 1,002,945 |
| Tullibee, smoked | pounds | 763,760 | 217,857 |
| Whitefish: | | | |
| Smoked | do | 150,719 | 47,540 |
| Caviar, canned | standard cases | 373 | 14,154 |
| Marine-shell products: | | | |
| Buttons | gross | 748,718 | 620,874 |
| Novelties | | (1) | 131,184 |
| Oysters, fresh-shucked | gallons | 252,192 | 661,816 |

[1] Data not available.

*Industries related to the fisheries of New York, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED—Continued

| Item | Quantity | Value |
|---|---|---|
| Unclassified products: | | |
| Smoked [2] ..... pounds | 42,500 | $9,750 |
| Canned [3] | (1) | 174,113 |
| Miscellaneous [4] | (1) | 381,145 |
| Total | | 8,987,001 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 504]

| | | |
|---|---|---|
| Scallops, bay, fresh shucked ..... gallons | 39,501 | $129,633 |
| Scallops, sea, fresh-shucked ..... do | 140,677 | 282,529 |
| Total ..... do | 180,178 | 412,162 |

[1] Data not available.
[2] Includes smoked cod fillets, and kippered herring.
[3] Includes canned salmon roe and caviar; canned spiced and soused salmon; canned pickled and smoked eels; canned pickled mussels; canned turtle soup and meat; canned terrapin meat and stew; and canned hard-clam products.
[4] Includes fresh pollock fillets; shucked scallops; fish meal; and fresh-water mussel-shell buttons.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 457 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## NEW JERSEY

*Fisheries of New Jersey, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|---|
| | Menhaden | Other | | Anchor | Drift | Run-around | Stake | Hand | Trawl |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 21 | 137 | | | 22 | | | 38 | 70 |
| On boats and shore— | | | | | | | | | |
| Regular | | | 74 | 4 | 122 | 129 | 41 | 193 | 280 |
| Casual | | | 170 | 6 | 174 | 19 | 70 | 85 | 53 |
| Total | 21 | 137 | 244 | 10 | 318 | 148 | 111 | 316 | 403 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | 2 | | | 3 | | | 1 | 3 |
| 11 to 20 tons | | 10 | | | 2 | | | 6 | 12 |
| 21 to 30 tons | | 3 | | | | | | 1 | |
| 61 to 70 tons | 1 | | | | | | | | |
| Total | 1 | 15 | | | 5 | | | 8 | 15 |
| Net tonnage | 70 | 236 | | | 51 | | | 114 | 172 |
| Boats: | | | | | | | | | |
| Motor | | | 20 | 4 | 121 | 70 | 35 | 165 | 159 |
| Other | | | 82 | 2 | 58 | | 29 | 13 | |
| Accessory boats | 2 | 21 | | | 3 | | 14 | 12 | |
| Apparatus: | | | | | | | | | |
| Number | 1 | 15 | 102 | 5 | 862 | 90 | 1,340 | 555 | 824 |
| Length, yards | 456 | 5,880 | 11,898 | | | | | | |
| Square yards | | | | 5,940 | 658,830 | 405,674 | 161,823 | | |
| Hooks, baits, or snoods | | | | | | | | 793 | 503,450 |

*Fisheries of New Jersey, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Lines—Contd. | | Pound nets | Weirs | Stop nets | Fyke nets | Dip nets | Cast nets | Drag nets |
|---|---|---|---|---|---|---|---|---|---|
| | Troll | Trot, with baits or snoods | | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 5 | | 253 | | | | | | |
| On boats and shore— | | | | | | | | | |
| Regular | 70 | 4 | 138 | 7 | 20 | 41 | 18 | | 4 |
| Casual | 35 | 3 | 19 | 23 | 86 | 85 | 19 | 4 | 2 |
| Total | 110 | 7 | 410 | 30 | 106 | 126 | 37 | 4 | 6 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | | 38 | | | | | | |
| 11 to 20 tons | 1 | | | | | | | | |
| Total | 1 | | 38 | | | | | | |
| Net tonnage | 11 | | 230 | | | | | | |
| Boats: | | | | | | | | | |
| Motor | 81 | 3 | 23 | 4 | 9 | 32 | 10 | | 3 |
| Other | | 1 | 1 | 16 | 50 | 50 | 23 | 1 | |
| Accessory boats | | | 12 | | | | | | |
| Apparatus: | | | | | | | | | |
| Number | 304 | 4 | 181 | 83 | 60 | 1,772 | 36 | 4 | 6 |
| Square yards | | | | | 34,704 | | | | |
| Yards at mouth | | | | | | | | | 17 |
| Hooks, baits, or snoods | 316 | 1,775 | | | | | | | |

| Item | Otter trawls | | Pots | | | Spears | Dredges | |
|---|---|---|---|---|---|---|---|---|
| | Fish | Shrimp | Crab | Eel | Lobster | | Clam | Crab |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 141 | 11 | | | | | 180 | 17 |
| On boats and shore— | | | | | | | | |
| Regular | 50 | | | 76 | 257 | 43 | 10 | |
| Casual | 1 | | 1 | 41 | 20 | 17 | 2 | 1 |
| Total | 192 | 11 | 1 | 117 | 277 | 60 | 192 | 18 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 12 | 2 | | | | | 5 | 5 |
| 11 to 20 tons | 16 | 1 | | | | | 12 | 2 |
| 21 to 30 tons | 1 | | | | | | 2 | |
| 31 to 40 tons | 2 | | | | | | | |
| 41 to 50 tons | 1 | | | | | | 1 | |
| 51 to 60 tons | 1 | | | | | | | |
| 61 to 70 tons | 1 | | | | | | | |
| 71 to 80 tons | 1 | | | | | | | |
| Total | 35 | 3 | | | | | 20 | 7 |
| Net tonnage | 640 | 27 | | | | | 310 | 69 |
| Boats: | | | | | | | | |
| Motor | 21 | | | 64 | 156 | 8 | 6 | 1 |
| Other | | | | 26 | | 51 | | |
| Accessory boats | | | | 6 | | | | |
| Apparatus: | | | | | | | | |
| Number | 61 | 3 | 4 | 5,299 | 33,920 | 60 | 56 | 53 |
| Yards at mouth | 1,331 | 72 | | | | | 62 | 59 |

*Fisheries of New Jersey, 1930*—Continued

OPERATING UNITS: By gear—Continued

| Item | Dredges—Con. | | Tongs | Rakes | Forks | Hoes | Gaffs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | Oyster | Scallop | | | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2,687 | 41 | | | | | | | 3,292 |
| On boats and shore— | | | | | | | | | |
| Regular | 19 | | 551 | 488 | 15 | 46 | 8 | 88 | 1,747 |
| Casual | 6 | | 326 | 211 | 3 | 30 | 24 | 76 | 1,177 |
| Total | 2,712 | 41 | 877 | 699 | 18 | 76 | 32 | 164 | 6,216 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 43 | 2 | | | | | | | 106 |
| 11 to 20 tons | 93 | | | | | | | | 128 |
| 21 to 30 tons | 23 | 1 | | | | | | | 28 |
| 31 to 40 tons | 8 | | | | | | | | 10 |
| 41 to 50 tons | 4 | | | | | | | | 5 |
| 51 to 60 tons | 4 | 1 | | | | | | | 5 |
| 61 to 70 tons | 1 | | | | | | | | 2 |
| 71 to 80 tons | 1 | | | | | | | | 2 |
| Total | 177 | 4 | | | | | | | 286 |
| Net tonnage | 3,096 | 96 | | | | | | | 4,434 |
| Sail— | | | | | | | | | |
| 5 to 10 tons | 18 | | | | | | | | 18 |
| 11 to 20 tons | 20 | | | | | | | | 20 |
| 21 to 30 tons | 15 | | | | | | | | 15 |
| 31 to 40 tons | 8 | | | | | | | | 8 |
| 41 to 50 tons | 5 | | | | | | | | 5 |
| 51 to 60 tons | 4 | | | | | | | | 4 |
| 61 to 70 tons | 5 | | | | | | | | 5 |
| 71 to 80 tons | 1 | | | | | | | | 1 |
| 91 to 100 tons | 1 | | | | | | | | 1 |
| Total | 77 | | | | | | | | 77 |
| Net tonnage | 2,085 | | | | | | | | 2,085 |
| Total vessels | 254 | 4 | | | | | | | 363 |
| Total net tonnage | 5,181 | 96 | | | | | | | 6,519 |
| Boats: | | | | | | | | | |
| Motor | 16 | | 521 | 416 | 4 | 12 | | 37 | 1,379 |
| Other | | | 318 | 254 | 17 | 58 | 1 | 84 | 750 |
| Accessory boats | | | 37 | 14 | | | | | 121 |
| Apparatus: | | | | | | | | | |
| Number | 537 | 9 | 868 | 667 | 19 | 74 | 32 | | |
| Yards at mouth | 634 | 29 | | | | | | | |

CATCH: By gear

| Species | Purse seines | | | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | | | Anchor | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Albacore | | | 50 | $3 | | | | |
| Alewives | | | | | 40,986 | $878 | | |
| Bluefish | | | 322,457 | 33,951 | 1,062 | 190 | 950 | $122 |
| Bonito | | | 908 | 81 | | | | |
| Butterfish | | | 15,670 | 1,248 | | | | |
| Carp | | | | | 25,601 | 2,938 | | |
| Catfish and bullheads | | | | | 11,340 | 988 | | |
| Cod | | | 4,860 | 59 | | | | |
| Croaker | | | 132,340 | 2,976 | 44,889 | 1,633 | | |
| Eels | | | | | 1,050 | 113 | | |
| Flounders | | | 372 | 21 | 48,900 | 4,138 | | |
| Herring, sea | | | | | 1,500 | 30 | | |
| King whiting or "kingfish" | | | 20 | 2 | 1,605 | 182 | | |
| Mackerel | | | 160 | 13 | | | | |
| Menhaden | 3,663,000 | $19,250 | 997,285 | 8,387 | | | 3,510 | 27 |
| Minnows | | | | | 18,000 | 220 | | |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Purse seines | | | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | | | Anchor | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Mummichog | | | | | 16,000 | $200 | | |
| Scup | | | 3,343,693 | $63,223 | | | | |
| Sea bass | | | 251,145 | 5,213 | | | | |
| Shad | | | | | 10,748 | 3,811 | 156 | $46 |
| Spanish mackerel | | | 778 | 54 | | | | |
| Spot | | | | | 4,852 | 273 | | |
| Squeteague or "sea trout," gray | | | 2,239,720 | 56,381 | 71,885 | 5,879 | 450 | 26 |
| Striped bass | | | | | 7,803 | 2,025 | | |
| Sturgeon | | | | | 128 | 51 | | |
| Suckers | | | | | 23,397 | 2,290 | | |
| White perch | | | | | 27,475 | 2,764 | | |
| Yellow perch | | | | | 4,800 | 344 | | |
| Total | 3,663,000 | $19,250 | 7,309,458 | 171,612 | 362,021 | 28,947 | 5,066 | 221 |

| Species | Gill nets—Continued | | | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | Drift | | Runaround | | Stake | | Hand | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 3,648 | $148 | | | 2,204 | $62 | | |
| Bluefish | 14,812 | 1,511 | 259,603 | $21,374 | 25,689 | 3,866 | 1,425,052 | $164,635 |
| Bonito | | | | | | | 114,752 | 5,239 |
| Butterfish | 27,102 | 2,219 | 2,520 | 402 | | | | |
| Carp | 430 | 48 | | | | | 290 | 44 |
| Catfish and bullheads | | | | | 200 | 14 | | |
| Cero | | | | | | | 20,000 | 2,000 |
| Cod | | | | | | | 136,642 | 3,347 |
| Croaker | 69,965 | 2,070 | 200 | 8 | 30 | 3 | 28,566 | 1,168 |
| Dolphin | | | | | | | 332 | 24 |
| Eels | | | | | | | 6,420 | 641 |
| Flounders | | | 8 | 1 | | | 32,665 | 2,206 |
| Hake | | | 462 | 5 | | | | |
| Herring, sea | | | 14 | 1 | | | | |
| King whiting or "kingfish" | 50 | 3 | | | 500 | 75 | 100 | 8 |
| Mackerel | 434,026 | 15,294 | 164,000 | 6,400 | | | | |
| Menhaden | 20,000 | 200 | 22,065 | 243 | | | | |
| Pilotfish | | | | | | | 414 | 17 |
| Scup | 2,350 | 61 | 1,000 | 40 | | | 71,010 | 1,416 |
| Sea bass | | | 2,500 | 75 | | | 270,934 | 7,403 |
| Shad | 144,419 | 27,159 | | | 44,829 | 6,469 | | |
| Skates | | | | | | | 3,750 | 95 |
| Snapper, red | | | | | | | 4,000 | 400 |
| Spanish mackerel | | | | | | | 1,891 | 132 |
| Spot | 89,870 | 4,529 | 2,743 | 119 | 2,500 | 175 | 900 | 45 |
| Squeteague or "sea trout," gray | 223,900 | 9,711 | 189,604 | 7,787 | 9,406 | 905 | 77,392 | 3,529 |
| Striped bass | | | | | 5,784 | 1,547 | 16,820 | 817 |
| Sturgeon | 995 | 521 | | | | | 21,999 | 879 |
| Tautog | | | | | | | 800 | 80 |
| Tuna or "horse mackerel" | | | | | 46,942 | 6,008 | | |
| White perch | | | | | 1,010 | 71 | | |
| Yellow perch | | | | | | | | |
| Total | 1,031,567 | 63,474 | 644,719 | 36,455 | 139,094 | 19,195 | 2,234,729 | 194,251 |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Lines—Continued | | | | | | Pound nets | |
|---|---|---|---|---|---|---|---|---|
| | Trawl | | Troll | | Trot, with baits or snoods | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Albacore | | | | | | | 31,064 | $506 |
| Bluefish | | | 334,677 | $30,822 | | | 576,219 | 56,064 |
| Bonito | | | | | | | 114,586 | 7,841 |
| Butterfish | | | | | | | 2,340,296 | 173,985 |
| Cod | 6,403,463 | $194,515 | | | | | 935,563 | 30,815 |
| Croaker | | | | | | | 511,972 | 20,805 |
| Cusk | 6,500 | 65 | | | | | 1,900 | 19 |
| Dolphin | | | | | | | 800 | 16 |
| Drum: | | | | | | | | |
| Black | | | | | | | 6,784 | 126 |
| Red or redfish | | | | | | | 64,666 | 11,635 |
| Eels | | | | | | | 10,278 | 1,028 |
| Flounders | 8,000 | 800 | | | | | 401,303 | 29,370 |
| Goosefish | | | | | | | 37,892 | 1,118 |
| Grayfish | | | | | | | 11,440 | 229 |
| Haddock | 15 | 1 | | | | | 5,782 | 204 |
| Hagfish | | | | | | | 7,200 | 72 |
| Hake | 14,000 | 440 | | | | | 205,855 | 3,510 |
| Herring, sea | | | | | | | 587,533 | 5,875 |
| King whiting or "kingfish" | | | | | | | 61,148 | 6,785 |
| Mackerel | | | | | | | 55,742 | 3,699 |
| Menhaden | | | | | | | 1,208,850 | 13,226 |
| Mullet | | | | | | | 150 | 6 |
| Pilotfish | | | | | | | 2,046 | 106 |
| Pollock | | | | | | | 2,964 | 111 |
| Scup | | | | | | | 2,733,907 | 87,513 |
| Sea bass | | | | | | | 1,218,246 | 61,332 |
| Sea robin | | | | | | | 117,747 | 1,946 |
| Shad | | | | | | | 23,559 | 3,641 |
| Sharks | | | | | | | 175,669 | 3,699 |
| Skates | 31,636 | 907 | | | | | 204,905 | 3,366 |
| Spanish mackerel | | | 250 | 13 | | | 12,920 | 1,297 |
| Spot | | | | | | | 437,336 | 17,340 |
| Squeteague or "sea trout," gray | | | | | | | 8,054,464 | 264,131 |
| Striped bass | | | | | | | 5,105 | 971 |
| Sturgeon | | | | | | | 280 | 200 |
| Tautog | | | | | | | 133,650 | 4,462 |
| Thimble-eyed mackerel | | | | | | | 35,722 | 1,115 |
| Tuna or "horse mackerel" | | | | | | | 30,762 | 2,393 |
| White perch | | | | | | | 2,020 | 80 |
| Whiting | | | | | | | 3,754,942 | 59,428 |
| Crabs: | | | | | | | | |
| Hard | | | | | 15,058 | $1,333 | | |
| King | | | | | | | 1,247,000 | 11,489 |
| Soft | | | | | 148 | 55 | | |
| Squid | | | | | | | 1,233,326 | 32,882 |
| Turtles: | | | | | | | | |
| Loggerhead | | | | | | | 800 | 24 |
| Snapper | | | | | | | 1,800 | 27 |
| Total | 6,463,614 | 196,728 | 334,927 | 30,835 | 15,206 | 1,388 | 26,612,193 | 924,487 |

| Species | Weirs | | Stop nets | | Fyke nets | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 4,284 | $690 | 1,413,000 | $14,150 | | |
| Carp | | | 71,889 | 9,716 | | | | |
| Catfish and bullheads | | | 1,190 | 111 | 23,617 | 1,848 | | |
| Croaker | 1,560 | $60 | | | | | | |
| Eels | | | | | 41,312 | 5,891 | | |
| Flounders | 1,500 | 105 | | | 157,330 | 6,897 | | |
| Herring, sea | | | | | 70,800 | 758 | | |
| Spot | 1,620 | 81 | | | | | | |
| Squeteague or "sea trout," gray | 1,880 | 94 | | | | | | |
| Striped bass | | | | | 1,350 | 401 | | |
| Suckers | | | 3,786 | 490 | 392 | 47 | | |
| White perch | | | | | 68,800 | 8,250 | | |
| Yellow perch | | | | | 173,400 | 14,218 | | |
| Crabs: | | | | | | | | |
| Hard | | | | | | | 23,000 | $1,419 |
| King | 3,967,500 | 15,903 | | | | | | |
| Soft | | | | | | | 19,016 | 7,318 |
| Turtles, snapper | | | | | 1,700 | 196 | | |
| Total | 3,974,060 | 16,243 | 81,149 | 11,007 | 1,951,701 | 52,656 | 42,016 | 8,737 |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Cast nets | | Drag nets | | Otter trawls | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Fish | | Shrimp | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | 1,223 | $127 | | |
| Butterfish | | | | | 8,233 | 755 | | |
| Carp | 2,222 | $400 | | | | | | |
| Cod | | | | | 298,843 | 6,933 | | |
| Croaker | | | | | 650,285 | 21,770 | | |
| Drum: | | | | | | | | |
| Black | | | | | 120 | 9 | | |
| Red or redfish | | | | | 258 | 21 | | |
| Eels | | | | | 25 | 3 | | |
| Flounders | | | | | 2,276,274 | 104,312 | | |
| Grunts | | | | | 150 | 6 | | |
| Hake | | | | | 2,430 | 47 | | |
| King whiting or "kingfish" | | | | | 5,800 | 483 | | |
| Mackerel | | | | | 1,800 | 36 | | |
| Menhaden | | | | | 3,300 | 17 | | |
| Mullet | | | | | 190 | 16 | | |
| Scup | | | | | 1,412,081 | 31,013 | | |
| Sea bass | | | | | 691,991 | 19,000 | | |
| Shad | | | | | 3 | 1 | | |
| Sharks | | | | | 800 | 96 | | |
| Skates | | | | | 800 | 12 | | |
| Spot | | | | | 2,795 | 83 | | |
| Squeteague or "sea trout," gray | | | | | 228,991 | 9,401 | | |
| Sturgeon | | | | | 2,805 | 1,015 | | |
| Tautog | | | | | 7,507 | 218 | | |
| White perch | | | | | 4,119 | 124 | | |
| Whiting | | | | | 9,000 | 140 | | |
| Lobsters | | | | | 2,200 | 555 | | |
| Shrimp | | | 21,168 | $5,292 | 51,700 | 2,061 | 172,658 | $7,132 |
| Squid | | | | | 6,198 | 137 | | |
| Total | 2,222 | 400 | 21,168 | 5,292 | 5,669,921 | 198,391 | 172,658 | 7,132 |

| Species | Pots | | | | | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Eel | | Lobster | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | | | 323,234 | $32,965 | 1,050 | $84 | 156,380 | $17,883 |
| Sea bass | | | | | 1,111,333 | 41,337 | | |
| Tautog | | | | | 18,810 | 556 | | |
| Crabs, hard | 148 | $6 | | | 9,570 | 698 | | |
| Lobsters | | | | | 1,008,379 | 229,555 | | |
| Total | 148 | 6 | 323,234 | 32,965 | 2,149,142 | 272,230 | 156,380 | 17,883 |

| Species | Dredges | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Clam | | Crab | | Oyster | | Scallop | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, hard | | | 204,280 | $16,851 | | | | |
| Clams: | | | | | | | | |
| Hard, public | 100,592 | $6,469 | | | | | | |
| Hard, private | 88,500 | 16,650 | | | 3,552 | $1,475 | | |
| Surf or skimmer | 131,670 | 15,281 | | | | | | |
| Oysters: | | | | | | | | |
| Market, public, fall | | | | | 1,812 | 270 | | |
| Market, private, spring | | | | | 3,445,557 | 540,516 | | |
| Market, private, fall | | | | | 7,654,070 | 1,158,462 | | |
| Seed, public, spring | | | | | 18,444,424 | 2,401,056 | | |
| Seed, private, spring | | | | | 186,200 | 15,630 | | |
| Scallops, sea | | | | | | | 164,100 | $33,342 |
| Total | 320,852 | 38,400 | 204,280 | 16,851 | 29,735,615 | 4,117,409 | 164,100 | 33,342 |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Tongs | | Rakes | | Forks | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | |
| Hard, public | 814,856 | $375,155 | 575,687 | $235,745 | | |
| Hard, private | 4,672 | 2,083 | 54,096 | 4,850 | | |
| Soft, public | | | 135,787 | 18,581 | 124,831 | $17,205 |
| Mussels | 200 | 2 | | | | |
| Oysters: | | | | | | |
| Market, public, spring | 36,166 | 5,414 | 109 | 16 | | |
| Market, public, fall | 112,476 | 14,709 | 218 | 34 | | |
| Market, private, spring | 200,160 | 44,892 | 7,564 | 1,819 | | |
| Market, private, fall | 333,180 | 74,782 | 18,176 | 4,533 | | |
| Seed, public, spring | 138,914 | 15,378 | 38,632 | 4,948 | | |
| Seed, public, fall | 82,804 | 9,959 | | | | |
| Seed, private, spring | 106,555 | 13,636 | 123,738 | 10,860 | | |
| Seed, private, fall | 4,000 | 300 | | | | |
| Total | 1,833,983 | 556,310 | 954,007 | 281,386 | 124,831 | 17,205 |

| Species | Hoes | | Gaffs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: | | | | | | |
| King | | | | | 1,300 | $156 |
| Soft | 86,660 | $7,800 | | | | |
| Clams: | | | | | | |
| Hard, public | 6,080 | 871 | | | 64,341 | 29,858 |
| Soft, public | 234,679 | 32,250 | | | 133,331 | 19,772 |
| Mussels | | | | | 4,000 | 280 |
| Oysters: | | | | | | |
| Market, public, spring | | | | | 1,327 | 241 |
| Market, public, fall | | | | | 6,720 | 1,600 |
| Market, private, spring | | | | | 2,890 | 725 |
| Market, private, fall | | | | | 4,570 | 975 |
| Seed, private, spring | | | | | 22,850 | 1,918 |
| Terrapin, diamond-back | | | 215 | $414 | 5,826 | 6,658 |
| Turtles: | | | | | | |
| Loggerhead | | | 105 | 7 | | |
| Snapper | | | 3,930 | 358 | | |
| Total | 327,419 | 40,921 | 4,250 | 779 | 247,155 | 62,163 |

OPERATING UNITS: BY COUNTIES

| Item | Atlantic | Bergen | Burlington | Camden | Cape May | Cumberland | Gloucester |
|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 86 | 3 | 3 | | 336 | 2,663 | |
| On boats and shore— | | | | | | | |
| Regular | 292 | 2 | 64 | 2 | 410 | 81 | 1 |
| Casual | 160 | 20 | 74 | 9 | 260 | 172 | 51 |
| Total | 538 | 25 | 141 | 11 | 1,006 | 2,916 | 52 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | 2 | | | | 32 | 36 | |
| 11 to 20 tons | 14 | 1 | 1 | | 17 | 92 | |
| 21 to 30 tons | 2 | | | | 3 | 23 | |
| 31 to 40 tons | | | | | 2 | 8 | |
| 41 to 50 tons | | | | | 1 | 4 | |
| 51 to 60 tons | | | | | 1 | 4 | |
| 61 to 70 tons | | | | | 1 | 1 | |
| 71 to 80 tons | | | | | 1 | 1 | |
| Total | 18 | 1 | 1 | | 58 | 169 | |
| Net tonnage | 250 | 15 | 11 | | 846 | 3,033 | |
| Sail— | | | | | | | |
| 5 to 10 tons | | | | | | 18 | |
| 11 to 20 tons | | | | | | 20 | |
| 21 to 30 tons | | | | | | 15 | |
| 31 to 40 tons | | | | | | 8 | |
| 41 to 50 tons | | | | | | 5 | |
| 51 to 60 tons | | | | | | 4 | |

*Fisheries of New Jersey, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Atlantic | Bergen | Burlington | Camden | Cape May | Cumberland | Gloucester |
|---|---|---|---|---|---|---|---|
| Vessels—Continued. | | | | | | | |
| Sail—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 61 to 70 tons | | | | | | 5 | |
| 71 to 80 tons | | | | | | 1 | |
| 91 to 100 tons | | | | | | 1 | |
| Total | | | | | | 77 | |
| Net tonnage | | | | | | 2,085 | |
| Total vessels | 18 | 1 | 1 | | 58 | 246 | |
| Total net tonnage | 250 | 15 | 11 | | 846 | 5,118 | |
| Boats: | | | | | | | |
| Motor | 224 | 7 | 87 | | 324 | 103 | 8 |
| Other | 184 | | 34 | 4 | 156 | 77 | 20 |
| Accessory boats | 28 | 10 | | | 45 | 11 | |
| Apparatus: | | | | | | | |
| Purse seines— | | | | | | | |
| Menhaden | | | | | 1 | | |
| Length, yards | | | | | 456 | | |
| Other | 4 | | | | 11 | | |
| Length, yards | 1,600 | | | | 4,280 | | |
| Haul seines | 22 | | 19 | 4 | 14 | 12 | 3 |
| Length, yards | 1,818 | | 1,980 | 445 | 853 | 1,410 | 245 |
| Gill nets— | | | | | | | |
| Anchor | | | 1 | | | | |
| Square yards | | | 840 | | | | |
| Drift | 214 | | 21 | | 472 | 100 | 16 |
| Square yards | 47,720 | | 23,195 | | 211,148 | 88,500 | 13,530 |
| Runaround | | | | | | 4 | |
| Square yards | | | | | | 4,400 | |
| Stake | 64 | 7 | 6 | | 6 | 60 | |
| Square yards | 3,072 | 16,360 | 198 | | 600 | 7,672 | |
| Lines— | | | | | | | |
| Hand | 39 | | | | 177 | 44 | |
| Hooks | 70 | | | | 335 | 80 | |
| Trawl | 178 | | | | 344 | 14 | |
| Hooks | 114,200 | | | | 228,200 | 9,650 | |
| Troll | 17 | | | | 283 | 4 | |
| Hooks | 17 | | | | 295 | 4 | |
| Trot, with baits or snoods | | | | | | 3 | |
| Baits or snoods | | | | | | 775 | |
| Pound nets | 2 | | | | 93 | | |
| Weirs | | | | | 65 | 18 | |
| Stop nets | | | 7 | 1 | | 19 | 8 |
| Square yards | | | 5,550 | 45 | | 15,800 | 2,500 |
| Fyke nets | 4 | | 106 | | 96 | 185 | 130 |
| Dip nets | 13 | | | | 6 | 2 | |
| Cast nets | | | | | | | 4 |
| Otter trawls— | | | | | | | |
| Fish | 19 | | | | 42 | | |
| Yards at mouth | 471 | | | | 860 | | |
| Shrimp | | | | | 3 | | |
| Yards at mouth | | | | | 72 | | |
| Pots— | | | | | | | |
| Crab | | | | | 4 | | |
| Eel | 12 | 315 | | | 81 | 20 | |
| Lobster | | | | | 508 | | |
| Spears | 9 | | | | 1 | | |
| Dredges— | | | | | | | |
| Clam | | | | | 6 | 28 | |
| Yards at mouth | | | | | 4 | 36 | |
| Crab | | 10 | | | | | |
| Yards at mouth | | 8 | | | | | |
| Oyster | 4 | | 6 | | | 496 | |
| Yards at mouth | 4 | | 6 | | | 594 | |
| Scallop | | | | | | 4 | |
| Yards at mouth | | | | | | 16 | |
| Tongs | 325 | | 83 | | 134 | 101 | |
| Rakes | 273 | | 63 | | 121 | | |
| Hoes | 14 | | | | | | |
| Gaffs | | | | | 3 | 8 | 6 |

*Fisheries of New Jersey, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Hudson | Hunterdon | Mercer | Middlesex | Monmouth | Ocean | Salem | Union |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 3 | 48 | 150 | | |
| On boats and shore— | | | | | | | | |
| Regular | 2 | | | 6 | 551 | 304 | 32 | |
| Casual | | 28 | 21 | 7 | 90 | 211 | 73 | 1 |
| Total | 2 | 28 | 21 | 16 | 689 | 665 | 105 | 1 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | | | 2 | 8 | 26 | | |
| 11 to 20 tons | | | | | 3 | | | |
| Total | | | | 2 | 11 | 26 | | |
| Net tonnage | | | | 13 | 102 | 164 | | |
| Boats: | | | | | | | | |
| Motor | 2 | | 1 | 7 | 254 | 325 | 36 | 1 |
| Other | | 9 | 3 | 1 | 150 | 81 | 31 | |
| Accessory boats | 1 | | | 3 | 13 | 10 | | |
| Apparatus: | | | | | | | | |
| Haul seines | | 7 | 5 | | | 8 | 8 | |
| Length, yards | | 1,225 | 950 | | | 2,162 | 810 | |
| Gill nets— | | | | | | | | |
| Anchor | | | | | 4 | | | |
| Square yards | | | | | 5,100 | | | |
| Drift | | | | | 3 | | 36 | |
| Square yards | | | | | 47,800 | | 226,937 | |
| Runaround | | | | 4 | 42 | 40 | | |
| Square yards | | | | 9,910 | 129,564 | 261,800 | | |
| Stake | | | | 2 | | 1,195 | | |
| Square yards | | | | 720 | | 133,201 | | |
| Lines— | | | | | | | | |
| Hand | | | | | 210 | 80 | 1 | 4 |
| Hooks | | | | | 216 | 86 | 2 | 4 |
| Trawl | | | | | 135 | 153 | | |
| Hooks | | | | | 74,400 | 77,000 | | |
| Trot, with baits or snoods | | | | | | | 1 | |
| Baits or snoods | | | | | | | 1,000 | |
| Pound nets | | | | | 48 | 38 | | |
| Stop nets | | | | | | | 25 | |
| Square yards | | | | | | | 10,809 | |
| Fyke nets | | | 25 | | 51 | 876 | 299 | |
| Dip nets | | | | | 9 | 5 | 1 | |
| Drag nets | | | | | | 6 | | |
| Yards at mouth | | | | | | 17 | | |
| Pots— | | | | | | | | |
| Eel | 200 | | | 144 | 2,727 | 1,800 | | |
| Lobster | | | | 100 | 21,112 | 12,200 | | |
| Spears | | | | | 35 | 15 | | |
| Dredges— | | | | | | | | |
| Clam | | | | 6 | 16 | | | |
| Yards at mouth | | | | 6 | 16 | | | |
| Crab | | | | 8 | 35 | | | |
| Yards at mouth | | | | 8 | 43 | | | |
| Oyster | | | | | | 31 | | |
| Yards at mouth | | | | | | 30 | | |
| Scallop | | | | | 5 | | | |
| Yards at mouth | | | | | 13 | | | |
| Tongs | | | | | 19 | 206 | | |
| Rakes | | | | | 49 | 161 | | |
| Forks | | | | | 19 | | | |
| Hoes | | | | | 56 | 4 | | |
| Gaffs | | | | | | | 15 | |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY COUNTIES

| Species | Atlantic | | Bergen | | Burlington | | Camden | | Cape May | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Albacore | | | | | | | | | 50 | $3 |
| Alewives | | | | | 2,454 | $62 | 96 | $5 | 4,000 | 200 |
| Bluefish | 114,247 | $16,223 | | | | | | | 780,985 | 68,270 |
| Bonito | | | | | | | | | 20,480 | 1,464 |
| Butterfish | 28,940 | 2,175 | | | | | | | 942,807 | 59,040 |
| Carp | | | | | 1,947 | 290 | 7,400 | 565 | | |
| Catfish and bullheads | | | | | 1,470 | 277 | 565 | 58 | | |
| Cero | | | | | | | | | 20,000 | 2,000 |
| Cod | 2,380,381 | 61,848 | | | | | | | 3,091,981 | 87,208 |
| Croaker | 107,475 | 2,662 | | | | | | | 1,021,530 | 35,937 |
| Dolphin | | | | | | | | | 207 | 11 |
| Drum: | | | | | | | | | | |
| Black | | | | | | | | | 6,904 | 185 |
| Red or redfish | | | | | | | | | 64,924 | 11,656 |
| Eels | 55,333 | 5,055 | 21,500 | $975 | 2,540 | 279 | | | 41,912 | 5,510 |
| Flounders | 1,162,650 | 44,765 | | | | | | | 1,278,237 | 70,887 |
| Goosefish | | | | | | | | | 24,564 | 984 |
| Grunts | | | | | | | | | 150 | 6 |
| Hake | | | | | | | | | 5,315 | 91 |
| Herring, sea | 20,000 | 215 | | | | | | | 31,099 | 310 |
| King whiting or "kingfish" | 4,560 | 422 | | | | | | | 40,258 | 4,213 |
| Mackerel | 176,600 | 5,658 | | | | | | | 193,914 | 8,545 |
| Menhaden | | | | | | | | | 4,833,023 | 29,353 |
| Minnows | 16,000 | 200 | | | 2,000 | 20 | | | | |
| Mullet | | | | | | | | | 340 | 22 |
| Mummichog | 16,000 | 200 | | | | | | | | |
| Pilotfish | 300 | 12 | | | | | | | 1,360 | 55 |
| Pollock | | | | | | | | | 200 | 6 |
| Scup or porgy | 500,000 | 9,900 | | | | | | | 5,597,253 | 123,965 |
| Sea bass | 703,500 | 14,605 | | | | | | | 1,126,343 | 47,814 |
| Sea robin | | | | | | | | | 10,000 | 100 |
| Shad | 1,050 | 230 | 41,500 | 5,684 | 4,865 | 983 | 2,421 | 592 | 7,606 | 1,035 |
| Sharks | 500 | 20 | | | | | | | 64,906 | 1,322 |
| Skates | 4,450 | 108 | | | | | | | 90,808 | 2,501 |
| Snapper, red | | | | | | | | | 4,000 | 400 |
| Spanish mackerel | | | | | | | | | 15,801 | 1,486 |
| Spot | 9,050 | 362 | | | | | | | 215,679 | 9,195 |
| Squeteague or "sea trout," gray | 431,200 | 17,432 | | | | | | | 5,689,205 | 179,435 |
| Striped bass | 5,641 | 1,107 | | | 1,203 | 602 | | | 16 | 4 |
| Sturgeon | | | | | | | | | 2,805 | 1,015 |
| Suckers | | | | | 19,463 | 2,456 | 30 | 3 | | |
| Tautog | | | | | | | | | 58,416 | 2,224 |
| Thimble-eyed mackerel | | | | | | | | | 21,467 | 625 |
| Tuna or "horse mackerel" | | | | | | | | | 14,792 | 573 |
| White perch | 33,087 | 3,630 | | | 3,100 | 620 | | | 4,269 | 136 |
| Whiting | 10,800 | 108 | | | | | | | 90,032 | 982 |
| Crabs: | | | | | | | | | | |
| Hard | 2,600 | 230 | 25,000 | 2,250 | | | | | 18,616 | 975 |
| King | | | | | | | | | 4,641,800 | 26,892 |
| Soft | 86,660 | 7,800 | | | | | | | | |
| Lobsters | | | | | | | | | 2,200 | 555 |
| Shrimp | | | | | | | | | 224,358 | 9,193 |
| Squid | 880 | 44 | | | | | | | 388,658 | 11,451 |
| Clams: | | | | | | | | | | |
| Hard, public | 501,438 | 232,673 | | | 143,600 | 64,300 | | | 207,471 | 107,136 |
| Hard, private | 6,208 | 2,788 | | | | | | | 80 | 20 |
| Surf or skimmer | | | | | | | | | 131,670 | 15,281 |
| Mussels | | | | | | | | | 4,200 | 282 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | 4,057 | 965 | | | | | | | 5,111 | 1,043 |
| Market, public, fall | 8,305 | 2,085 | | | | | | | 9,038 | 2,194 |
| Market, private, spring | 164,958 | 38,781 | | | 76,496 | 15,795 | | | 3,310 | 825 |
| Market, private, fall | 257,092 | 60,666 | | | 151,583 | 31,187 | | | 7,090 | 1,575 |
| Seed, public, spring | 21,942 | 2,768 | | | 8,400 | 2,350 | | | 16,800 | 1,260 |
| Seed, private, spring | 136,793 | 16,771 | | | 182,700 | 15,225 | | | 24,850 | 2,198 |
| Terrapin, diamond-back | | | | | | | | | 333 | 599 |
| Turtles, snapper | | | | | | | | | 1,300 | 156 |
| Total | 6,972,697 | 552,508 | 88,000 | 8,909 | 601,821 | 134,446 | 10,512 | 1,223 | 31,104,023 | 940,358 |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Cumberland | | Gloucester | | Hudson | | Hunterdon | | Mercer | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 3,500 | $89 | 9,252 | $1,071 | | | | | 8,500 | $55 |
| Bluefish | 18,518 | 1,848 | | | | | | | | |
| Butterfish | 300 | 21 | | | | | | | | |
| Carp | 32,220 | 4,728 | 7,703 | 1,217 | | | 300 | $36 | 4,000 | 480 |
| Catfish and bullheads | 10,100 | 969 | 2,667 | 282 | | | 50 | 5 | | |
| Cod | 8,460 | 480 | | | | | | | | |
| Croaker | 62,486 | 1,963 | | | | | | | | |
| Eels | 5,880 | 551 | 540 | 68 | 20,000 | $2,000 | | | 600 | 60 |
| Flounders | 75 | 8 | | | | | | | | |
| King whiting or "kingfish" | 50 | 3 | | | | | | | | |
| Scup or porgy | 2,550 | 65 | | | | | | | | |
| Shad | 42,982 | 7,817 | 2,238 | 437 | | | 3,035 | 1,049 | 5,013 | 2,115 |
| Spot | 66,950 | 3,142 | | | | | | | | |
| Squeteague or "sea trout," gray | 92,769 | 4,050 | | | | | | | | |
| Striped bass | 19,070 | 1,255 | | | | | | | | |
| Sturgeon | | | | | | | | | 128 | 51 |
| Suckers | 340 | 51 | 142 | 15 | | | 3,100 | 230 | 4,500 | 72 |
| Tautog | 12,000 | 480 | | | | | | | | |
| White perch | 3,850 | 330 | | | | | | | | |
| Crabs: | | | | | | | | | | |
| Hard | 13,086 | 1,198 | | | | | | | | |
| King | 574,000 | 656 | | | | | | | | |
| Clams: | | | | | | | | | | |
| Hard, public | 79,632 | 3,410 | | | | | | | | |
| Hard, private | 88,590 | 16,650 | | | | | | | | |
| Oysters: | | | | | | | | | | |
| Market, public, spring | 28,434 | 3,663 | | | | | | | | |
| Market, public, fall | 103,883 | 12,334 | | | | | | | | |
| Market, private, spring | 3,214,855 | 486,529 | | | | | | | | |
| Market, private, fall | 7,408,143 | 1,103,705 | | | | | | | | |
| Seed, public, spring | 18,574,828 | 2,415,004 | | | | | | | | |
| Seed, public, fall | 82,804 | 9,959 | | | | | | | | |
| Seed, private, spring | 8,000 | 600 | | | | | | | | |
| Seed, private, fall | 4,000 | 300 | | | | | | | | |
| Scallops, sea | 58,500 | 9,800 | | | | | | | | |
| Terrapin, diamond-back | 5,708 | 6,453 | | | | | | | | |
| Turtles: | | | | | | | | | | |
| Loggerhead | 105 | 7 | | | | | | | | |
| Snapper | 780 | 72 | 500 | 50 | | | | | | |
| Total | 30,627,448 | 4,098,190 | 23,042 | 3,140 | 20,000 | 2,000 | 6,485 | 1,320 | 22,741 | 2,833 |

| Species | Middlesex | | Monmouth | | Ocean | | Salem | | Union | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Albacore | | | 27,464 | $452 | 3,600 | $54 | | | | |
| Alewives | | | | | 1,435,800 | 14,418 | 520 | $28 | | |
| Bluefish | 13,278 | $1,245 | 1,777,021 | 201,567 | 256,095 | 23,333 | | | 1,600 | $176 |
| Bonito | | | 147,242 | 7,789 | 61,724 | 3,852 | | | 800 | 56 |
| Butterfish | 20 | 2 | 732,479 | 57,986 | 689,775 | 59,385 | | | | |
| Carp | | | | | | | 46,862 | 5,830 | | |
| Catfish and bullheads | | | | | 14,110 | 750 | 7,385 | 620 | | |
| Cod | | | 1,148,238 | 45,104 | 1,150,311 | 41,029 | | | | |
| Croaker | | | 44,286 | 1,744 | 202,830 | 8,115 | 1,200 | 72 | | |
| Cusk | | | 1,900 | 19 | 6,500 | 65 | | | | |
| Dolphin | | | 800 | 16 | 125 | 13 | | | | |
| Eels | 2,950 | 295 | 238,638 | 28,824 | 148,161 | 14,767 | 1,695 | 224 | | |
| Flounders | 8 | 1 | 240,384 | 18,813 | 244,998 | 13,376 | | | | |
| Goosefish | | | 13,328 | 134 | | | | | | |
| Grayfish | | | 11,440 | 229 | | | | | | |
| Haddock | | | 5,797 | 205 | | | | | | |
| Hagfish | | | | | 7,200 | 72 | | | | |
| Hake | | | 141,766 | 2,790 | 75,666 | 1,121 | | | | |
| Herring, sea | 14 | 1 | 414,250 | 4,141 | 194,484 | 1,997 | | | | |
| King whiting or "kingfish" | | | 7,411 | 1,007 | 16,944 | 1,893 | | | | |
| Mackerel | | | 267,981 | 10,100 | 17,233 | 1,139 | | | | |
| Menhaden | 8,100 | 55 | 890,196 | 9,872 | 186,691 | 2,070 | | | | |

*Fisheries of New Jersey, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Middlesex | | Monmouth | | Ocean | | Salem | | Union | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Pilotfish | | | 800 | $56 | | | | | | |
| Pollock | | | 60 | 1 | 2,704 | $104 | | | | |
| Scup or porgy | | | 552,843 | 20,163 | 911,395 | 29,173 | | | | |
| Sea bass | | | 456,323 | 24,758 | 1,259,983 | 47,183 | | | | |
| Sea robin | | | 68,125 | 1,425 | 39,622 | 421 | | | | |
| Shad | | | 16,405 | 2,727 | 8,926 | 1,228 | 87,673 | $7,230 | | |
| Sharks | | | 52,957 | 1,773 | 58,106 | 680 | | | | |
| Skates | | | 82,517 | 1,124 | 63,316 | 647 | | | | |
| Spanish mackerel | | | 28 | 8 | 10 | 2 | | | | |
| Spot | 343 | $15 | 149,264 | 6,485 | 101,330 | 3,446 | | | | |
| Squeteague or "sea trout," gray | 18,838 | 922 | 1,919,697 | 75,829 | 2,945,433 | 80,139 | 550 | 37 | | |
| Striped bass | | | 5,089 | 967 | 5,843 | 1,826 | | | | |
| Sturgeon | | | 280 | 200 | | | 995 | 521 | | |
| Tautog | | | 67,318 | 1,899 | 44,232 | 1,512 | | | | |
| Thimble-eyed mackerel | | | 13,962 | 478 | 293 | 12 | | | | |
| Tuna or "horse mackerel" | | | 6,370 | 574 | 16,400 | 1,326 | | | | |
| White perch | | | | | 105,050 | 12,510 | | | | |
| Whiting | | | 2,833,775 | 48,782 | 829,335 | 9,696 | | | | |
| Yellow perch | | | | | 179,210 | 14,633 | | | | |
| Crabs: | | | | | | | | | | |
| Hard | 9,332 | 700 | 180,758 | 14,754 | | | 2,664 | 200 | | |
| Soft | | | 12,368 | 4,375 | 6,600 | 2,925 | 196 | 73 | | |
| Lobsters | 1,275 | 370 | 953,598 | 211,635 | 53,506 | 17,550 | | | | |
| Shrimp | | | | | 21,168 | 5,292 | | | | |
| Squid | | | 229,470 | 4,590 | 620,516 | 16,934 | | | | |
| Clams: | | | | | | | | | | |
| Hard, public | 7,104 | 1,420 | 107,097 | 15,907 | 515,214 | 223,252 | | | | |
| Hard, private | | | 53,536 | 4,600 | 2,496 | 1,000 | | | | |
| Soft, public | | | 628,184 | 87,722 | 444 | 86 | | | | |
| Oysters: | | | | | | | | | | |
| Market, private, spring | | | 6,712 | 1,235 | 189,840 | 44,787 | | | | |
| Market, private, fall | | | | | 186,088 | 41,619 | | | | |
| Seed, private, spring | | | | | 87,000 | 7,250 | | | | |
| Scallops, sea | | | 105,600 | 23,542 | | | | | | |
| Turtles: | | | | | | | | | | |
| Loggerhead | | | 800 | 24 | | | | | | |
| Snapper | | | 1,800 | 27 | | | 3,050 | 276 | | |
| Total | 61,262 | 5,026 | 14,616,357 | 946,452 | 12,966,307 | 752,682 | 152,790 | 25,111 | 2,400 | $232 |

*Industries related to the fisheries of New Jersey, 1930*

TRANSPORTING

| Item | Atlantic County | Cape May County | Cumberland County | Monmouth County | Ocean County | Total |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged: | | | | | | |
| On vessels | 5 | | 26 | 2 | 2 | 35 |
| On boats | | | 117 | | | 117 |
| Total | 5 | | 143 | 2 | 2 | 152 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | 2 | | 2 | | 1 | 5 |
| 11 to 20 tons | | | 1 | 1 | | 2 |
| 21 to 30 tons | | | 2 | | | 2 |
| 41 to 50 tons | | | 1 | | | 1 |
| Total | 2 | | 6 | 1 | 1 | 10 |
| Net tonnage | 13 | | 127 | 13 | 6 | 159 |
| Boats | | 1 | 175 | | | 176 |

*Industries related to the fisheries of New Jersey, 1930*—Continued

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Atlantic and Burlington Counties | Bergen and Hudson Counties | Camden and Gloucester Counties | Cape May County |
|---|---|---|---|---|
| Establishments | 15 | 7 | 4 | 22 |
| Persons engaged: | | | | |
| Proprietors | 21 | 5 | 5 | 26 |
| Salaried employees | 5 | 9 | 5 | 17 |
| Wage earners— | | | | |
| Average for season | 36 | 63 | 89 | 104 |
| Average for year | 26 | 53 | 68 | 62 |
| Paid to salaried employees | $20,260 | $22,940 | $16,300 | $52,230 |
| Paid to wage earners | 35,500 | 69,157 | 75,747 | 76,498 |
| Total salaries and wages | 55,760 | 92,097 | 92,047 | 128,728 |

| Item | Cumberland County | Essex and Passaic Counties | Monmouth County | Ocean County | Total |
|---|---|---|---|---|---|
| Establishments | 30 | 14 | 15 | 17 | 124 |
| Persons engaged: | | | | | |
| Proprietors | 54 | 17 | 18 | 19 | 165 |
| Salaried employees | 60 | 31 | 6 | 8 | 141 |
| Wage earners— | | | | | |
| Average for season | 734 | 361 | 101 | 48 | 1,536 |
| Average for year | 298 | 351 | 43 | 28 | 929 |
| Paid to salaried employees | $82,587 | $113,145 | $10,778 | $27,020 | $345,260 |
| Paid to wage earners | 175,882 | 345,994 | 73,015 | 45,521 | 897,314 |
| Total salaries and wages | 258,469 | 459,139 | 83,793 | 72,541 | 1,242,574 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| King crabs, dry scrap | tons | 458 | $17,857 |
| Clams, soft, fresh-shucked | gallons | 35,064 | 51,766 |
| Marine-shell products: | | | |
| Buttons | gross | 907,015 | 1,149,840 |
| Novelties | | (1) | 343,244 |
| Oysters: | | | |
| Fresh-shucked | gallons | 439,824 | 952,651 |
| Shell products— | | | |
| Poultry feed | tons | 7,008 | 72,267 |
| Lime | do | 1,618 | 8,158 |
| Miscellaneous [2] | | (1) | 1,053,477 |
| Total | | | 3,649,260 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 49]

| | | | |
|---|---|---|---|
| Eels, smoked | pounds | 19,617 | $7,847 |
| Scallops, sea, fresh-shucked | gallons | 18,000 | 33,000 |
| Total | | | 40,847 |

[1] Data not available.

[2] Includes cod and flounder fillets; spiced carp; smoked butterfish, carp, chub, cisco, eels, herring, mackerel, salmon, salmon trout, shad, domestic and Russian sturgeon, lake trout, tullibee, whitefish, and kippered herring; canned hard-clam chowder; king crab meal; menhaden products; and buttons from fresh-water mussels.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 119 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 49 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## PENNSYLVANIA

*Fisheries of Pennsylvania, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets, drift | Lines, hand | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen, on boats and shore, casual | 37 | 19 | 1 | 1 | 52 |
| Boats: | | | | | |
| Motor | | 5 | | | 5 |
| Other | 10 | 5 | 1 | 1 | 14 |
| Apparatus: | | | | | |
| Number | 11 | 11 | 1 | 30 | |
| Length, yards | 1,380 | | | | |
| Square yards | | 15,690 | | | |
| Hooks, baits, or snoods | | | 1 | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets, drift | | Lines, hand | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 2,000 | $100 | | | | |
| Carp | 893 | $97 | | | | | | |
| Catfish and bullheads | 125 | 13 | | | | | 1,300 | $150 |
| Eels | | | | | 865 | $200 | | |
| Shad | 2,112 | 842 | 2,743 | 622 | | | | |
| Sturgeon | 182 | 182 | | | | | | |
| Suckers | 6,525 | 597 | | | | | | |
| Total | 9,837 | 1,731 | 4,743 | 722 | 865 | 200 | 1,300 | 150 |

OPERATING UNITS: BY COUNTIES

| Item | Bucks | Delaware | Philadelphia |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Fishermen on boats and shore, casual | 41 | 9 | 2 |
| Boats: | | | |
| Motor | | 4 | 1 |
| Other | 12 | 1 | 1 |
| Apparatus: | | | |
| Haul seines | 11 | | |
| Length, yards | 1,380 | | |
| Gill nets, drift | 5 | 5 | 1 |
| Square yards | 4,110 | 10,530 | 1,050 |
| Lines, hand | | | 1 |
| Hooks | | | 1 |
| Fyke nets | | 30 | |

*Fisheries of Pennsylvania, 1930*—Continued

CATCH: BY COUNTIES

| Species | Bucks | | Delaware | | Philadelphia | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 2,000 | $100 | | |
| Carp | 893 | $97 | | | | |
| Catfish and bullheads | 125 | 13 | 1,300 | 150 | | |
| Eels | | | | | 865 | $200 |
| Shad | 2,720 | 1,053 | 2,015 | 368 | 120 | 48 |
| Sturgeon | 182 | 182 | | | | |
| Suckers | 6,525 | 597 | | | | |
| Total | 10,445 | 1,942 | 5,315 | 613 | 985 | 248 |

*Industries related to the fisheries of Pennsylvania*

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Berks, Delaware, and Lehigh Counties | Philadelphia County | Total |
|---|---|---|---|
| Establishments | 3 | 53 | 56 |
| Persons engaged: | | | |
| Proprietors | 5 | 81 | 86 |
| Salaried employees | 8 | 116 | 124 |
| Wage earners— | | | |
| Average for season | 52 | 488 | 540 |
| Average for year | 48 | 405 | 453 |
| Paid to salaried employees | $34,734 | $520,193 | $554,927 |
| Paid to wage earners | 36,873 | 571,478 | 608,351 |
| Total salaries and wages | 71,607 | 1,091,671 | 1,163,278 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Herring, sea, smoked | pounds | 112,000 | $9,240 |
| Mackerel, smoked | do | 7,600 | 1,600 |
| Shad, smoked | do | 87,375 | 20,044 |
| Whitefish, smoked | do | 35,000 | 11,750 |
| Hard clams, fresh-shucked | gallons | 9,234 | 23,044 |
| Oysters: | | | |
| Fresh-shucked | do | 103,605 | 268,097 |
| Shell products— | | | |
| Poultry feed | tons | 5,738 | 61,091 |
| Lime | do | 1,752 | 8,629 |
| Miscellaneous [1] | | (2) | 1,623,110 |
| Total | | | 2,027,205 |

[1] Includes spiced alewives and herring; smoked alewives, butterfish, carp, chub, ciscoes, cod fillets, haddock fillets, herring bloaters, kippered herring, Nova Scotia herring, salmon, kippered salmon, sturgeon, lake trout, tullibee from Canada, Russian sturgeon, and finnan haddie; fish scrap; marine-shell products; and fresh-water mussel-shell products.

[2] Data not available.

## DELAWARE

### *Fisheries of Delaware, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | Lines | | |
|---|---|---|---|---|---|---|---|---|
| | | | Drift | Run-around | Stake | Hand | Trawl | Trot, with baits or snoods |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 570 | | | | | | | |
| On boats and shore— | | | | | | | | |
| Regular | | 124 | 37 | 42 | 31 | 31 | 8 | |
| Casual | | 229 | 71 | 31 | 40 | 11 | 2 | 1 |
| Total | 570 | 353 | 108 | 73 | 71 | 42 | 10 | 1 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 41 to 50 tons | 1 | | | | | | | |
| 81 to 90 tons | 1 | | | | | | | |
| 101 to 110 tons | 3 | | | | | | | |
| 111 to 120 tons | 1 | | | | | | | |
| 121 to 130 tons | 1 | | | | | | | |
| 161 to 170 tons | 2 | | | | | | | |
| 171 to 180 tons | 4 | | | | | | | |
| 181 to 190 tons | 1 | | | | | | | |
| Total | 14 | | | | | | | |
| Net tonnage | 1,904 | | | | | | | |
| Motor— | | | | | | | | |
| 61 to 70 tons | 1 | | | | | | | |
| 101 to 110 tons | 1 | | | | | | | |
| Total | 2 | | | | | | | |
| Net tonnage | 172 | | | | | | | |
| Total vessels | 16 | | | | | | | |
| Total net tonnage | 2,076 | | | | | | | |
| Boats: | | | | | | | | |
| Motor | | 1 | 39 | 12 | 7 | 13 | 4 | |
| Other | | 93 | 14 | 22 | 27 | 5 | 1 | 1 |
| Accessory boats | 51 | 6 | 3 | 1 | 4 | | | |
| Apparatus: | | | | | | | | |
| Number | 16 | 87 | 79 | 45 | 209 | 52 | 14 | 1 |
| Length, yards | 6,528 | 23,970 | | | | | | |
| Square yards | | | 211,379 | 40,000 | 23,424 | | | |
| Hooks, baits, or snoods | | | | | | 104 | 6,100 | 50 |

| Item | Pound nets | Stop nets | Fyke nets | Dip nets | Cast nets | Pots | | Spears |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Eel | Lobster | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On boats and shore— | | | | | | | | |
| Regular | 16 | 2 | 22 | 20 | | 18 | 11 | |
| Casual | 25 | 12 | 27 | 16 | 7 | 16 | 2 | 6 |
| Total | 41 | 14 | 49 | 36 | 7 | 34 | 13 | 6 |
| Boats: | | | | | | | | |
| Motor | | | 3 | 1 | | 6 | 4 | 2 |
| Other | 15 | 9 | 15 | 21 | 4 | 17 | | 3 |
| Accessory boats | 2 | | 2 | | | 2 | | |
| Apparatus: | | | | | | | | |
| Number | 67 | 9 | 320 | 36 | 7 | 775 | 185 | 6 |
| Square yards | | 3,368 | | | | | | |

*Fisheries of Delaware, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Dredges | | Tongs | Rakes | Gaffs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Clam | Oyster | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 30 | 90 | | | | | 666 |
| On boats and shore— | | | | | | | |
| Regular | | | 67 | 5 | | | 197 |
| Casual | | | 13 | | 1 | 10 | 374 |
| Total | 30 | 90 | 80 | 5 | 1 | 10 | 1,237 |
| Vessels: | | | | | | | |
| Steam— | | | | | | | |
| 41 to 50 tons | | | | | | | 1 |
| 81 to 90 tons | | | | | | | 1 |
| 101 to 110 tons | | | | | | | 3 |
| 111 to 120 tons | | | | | | | 1 |
| 121 to 130 tons | | | | | | | 1 |
| 161 to 170 tons | | | | | | | 2 |
| 171 to 180 tons | | | | | | | 4 |
| 181 to 190 tons | | | | | | | 1 |
| Total | | | | | | | 14 |
| Net tonnage | | | | | | | 1,904 |
| Motor— | | | | | | | |
| 5 to 10 tons | 1 | 2 | | | | | 2 |
| 11 to 20 tons | 1 | 2 | | | | | 2 |
| 21 to 30 tons | 2 | 2 | | | | | 3 |
| 61 to 70 tons | | | | | | | 1 |
| 101 to 110 tons | | | | | | | 1 |
| Total | 4 | 6 | | | | | 9 |
| Net tonnage | 66 | 95 | | | | | 289 |
| Sail— | | | | | | | |
| 5 to 10 tons | | 3 | | | | | 3 |
| 11 to 20 tons | 1 | 7 | | | | | 7 |
| Total | 1 | 10 | | | | | 10 |
| Net tonnage | 14 | 133 | | | | | 133 |
| Total vessels | 5 | 16 | | | | | 33 |
| Total net tonnage | 80 | 228 | | | | | 2,326 |
| Boats: | | | | | | | |
| Motor | | | 2 | 3 | | | 68 |
| Other | | | 70 | | | | 192 |
| Accessory boats | | | 18 | 1 | | | 86 |
| Apparatus: | | | | | | | |
| Number | 10 | 32 | 80 | 6 | 1 | 10 | |
| Yards at mouth | 10 | 39 | | | | | |

CATCH: BY GEAR

| Species | Purse seines, menhaden | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 3,039,201 | $6,188 | 30,533 | $389 | | |
| Bluefish | | | 3,750 | 371 | 17,500 | 1,114 | | |
| Carp | | | 56,184 | 5,017 | 2,000 | 240 | | |
| Catfish and bullheads | | | 24,295 | 2,250 | | | | |
| Croaker | | | 398,350 | 9,992 | 449,800 | 9,200 | 163,880 | $5,324 |
| Eels | | | 4,282 | 510 | | | | |
| Flounders | | | 28,950 | 1,998 | | | | |
| Gizzard shad | | | 950 | 7 | | | | |
| King whiting or "kingfish" | | | 3,080 | 119 | | | | |
| Menhaden | 41,960,142 | $307,112 | | | | | | |
| Mullet | | | 1,800 | 130 | | | 63,000 | 4,170 |
| Shad | | | 1,016 | 168 | 46,229 | 9,424 | | |
| Spot | | | 3,960 | 101 | 122,500 | 6,526 | 51 | 3 |
| Squeteagues or "sea trout," gray | | | 713,350 | 25,892 | 315,000 | 6,817 | 87,800 | 2,681 |
| Striped bass | | | 25,250 | 5,585 | 13,500 | 3,645 | | |
| Sturgeon | | | | | 15,313 | 6,253 | | |
| White perch | | | 96,775 | 15,148 | 19,900 | 3,936 | | |
| Yellow perch | | | 32,035 | 3,155 | | | | |
| Yellowtail | | | 2,940 | 84 | | | | |
| Total | 41,960,142 | 307,112 | 4,436,168 | 76,715 | 1,032,275 | 47,544 | 314,731 | 12,178 |

*Fisheries of Delaware, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets—Con. | | Lines | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Stake | | Hand | | Trawl | | Trot, with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 88,926 | $2,268 | | | | | | |
| Bluefish | 4,900 | 343 | 4,860 | $486 | | | | |
| Carp | 14,000 | 2,040 | | | | | | |
| Catfish and bullheads | 931 | 126 | | | | | | |
| Cod | | | | | 97,144 | $3,600 | | |
| Croaker | | | 112,900 | 4,188 | | | | |
| Eels | | | | | | | 2,605 | $443 |
| Flounders | 68,550 | 4,897 | | | | | | |
| Scup | | | 27,000 | 2,160 | | | | |
| Sea bass | | | 20,250 | 1,620 | | | | |
| Shad | 7,201 | 1,282 | | | | | | |
| Spot | | | 20,250 | 1,620 | | | | |
| Squeteagues or "sea trout," gray | 41,900 | 490 | 75,975 | 4,518 | | | | |
| Striped bass | 57,494 | 12,090 | | | | | | |
| Suckers | 150 | 9 | | | | | | |
| Tautog | | | 74,000 | 2,300 | | | | |
| White perch | 55,030 | 9,411 | | | | | | |
| Total | 339,082 | 32,956 | 335,235 | 16,892 | 97,144 | 3,600 | 2,605 | 443 |

| Species | Pound nets | | Stop nets | | Fyke nets | | Dip nets | | Cast nets | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 34,706 | $891 | | | 600 | $6 | | | | |
| Carp | 1,688 | 212 | 4,659 | $674 | 630 | 38 | | | 5,175 | $734 |
| Catfish and bullheads | 7,333 | 775 | 775 | 72 | 3,273 | 279 | | | 1,310 | 146 |
| Eels | 2,818 | 393 | | | 44,387 | 5,158 | | | | |
| Flounders | 7,393 | 525 | | | 27,660 | 2,083 | | | | |
| Squeteagues or "sea trout," gray | 400 | 40 | | | 300 | 30 | | | | |
| Striped bass | 1,453 | 351 | | | 4,330 | 778 | | | | |
| White perch | 6,234 | 799 | | | 32,032 | 5,821 | | | | |
| Yellow perch | 2,350 | 229 | 330 | 26 | 13,045 | 1,279 | | | | |
| Crabs: | | | | | | | | | | |
| King | 762,500 | 990 | | | | | | | | |
| Soft | | | | | | | 23,800 | $4,850 | | |
| Turtles, snapper | | | | | 2,550 | 133 | | | | |
| Total | 826,875 | 5,205 | 5,764 | 772 | 128,807 | 15,605 | 23,800 | 4,850 | 6,485 | 879 |

| Species | Pots | | | | Spears | | Dredges | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eel | | Lobster | | | | Clam | | Oyster | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | | | 1,500 | $90 | | | | |
| Catfish and bullheads | | | | | 1,000 | 114 | | | | |
| Eels | 38,499 | $4,354 | | | 998 | 138 | | | | |
| Lobsters | | | 11,750 | $2,620 | | | | | | |
| Clams: | | | | | | | | | | |
| Hard, public | | | | | | | 6,903 | $2,020 | | |
| Hard, private | | | | | | | 6,003 | 2,001 | | |
| Oysters: | | | | | | | | | | |
| Market, private, spring | | | | | | | 28,120 | 3,967 | | |
| Market, private, fall | | | | | | | 29,712 | 4,171 | 201,926 | $27,618 |
| Seed, public, spring | | | | | | | 38,250 | 2,550 | 549,000 | 39,600 |
| Total | 38,499 | 4,354 | 11,750 | 2,620 | 3,498 | 342 | 108,988 | 14,709 | 750,926 | 67,218 |

*Fisheries of Delaware, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Tongs | | Rakes | | Gaffs | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, king | | | | | | | 206,260 | $275 |
| Clams, hard, public | 9,600 | $1,020 | 2,000 | $750 | | | | |
| Mussels | 19,500 | 1,875 | | | | | | |
| Oysters: | | | | | | | | |
| Market, public, fall | 166,467 | 18,942 | | | | | | |
| Market, private, fall | 1,875 | 213 | | | | | | |
| Seed, public, spring | 176,850 | 11,220 | | | | | | |
| Seed, public, fall | 75,374 | 4,501 | | | | | | |
| Turtles, snapper | | | | | 100 | $5 | | |
| Total | 449,666 | 37,771 | 2,000 | 750 | 100 | 5 | 206,260 | 275 |

OPERATING UNITS: BY COUNTIES

| Item | Kent | New Castle | Sussex |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 90 | | 576 |
| On boats and shore— | | | |
| Regular | 118 | 1 | 78 |
| Casual | 49 | 71 | 254 |
| Total | 257 | 72 | 908 |
| Vessels: | | | |
| Steam— | | | |
| 41 to 50 tons | | | 1 |
| 81 to 90 tons | | | 1 |
| 101 to 110 tons | | | 3 |
| 111 to 120 tons | | | 1 |
| 121 to 130 tons | | | 1 |
| 161 to 170 tons | | | 2 |
| 171 to 180 tons | | | 4 |
| 181 to 190 tons | | | 1 |
| Total | | | 14 |
| Net tonnage | | | 1,904 |
| Motor— | | | |
| 5 to 10 tons | 2 | | |
| 11 to 20 tons | 2 | | |
| 21 to 30 tons | 2 | | 1 |
| 61 to 70 tons | | | 1 |
| 101 to 110 tons | | | 1 |
| Total | 6 | | 3 |
| Net tonnage | 93 | | 196 |
| Sail— | | | |
| 5 to 10 tons | 3 | | |
| 11 to 20 tons | 7 | | |
| Total | 10 | | |
| Net tonnage | 133 | | |
| Total vessels | 16 | | 17 |
| Total net tonnage | 226 | | 2,100 |
| Boats: | | | |
| Motor | 17 | 16 | 35 |
| Other | 80 | 26 | 86 |
| Accessory boats | 21 | 4 | 61 |
| Apparatus: | | | |
| Purse seines, menhaden | | | 16 |
| Length, yards | | | 6,528 |
| Haul seines | 24 | 15 | 48 |
| Length, yards | 8,010 | 1,530 | 14,430 |
| Gill nets— | | | |
| Drift | 11 | 29 | 39 |
| Square yards | 35,000 | 133,889 | 42,490 |
| Runaround | 4 | | 41 |
| Square yards | 14,000 | | 26,000 |
| Stake | 46 | 7 | 156 |
| Square yards | 9,490 | 2,800 | 11,134 |

*Fisheries of Delaware, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Kent | New Castle | Sussex |
|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* |
| Lines— | | | |
| Hand | 20 | | 32 |
| Hooks | 40 | | 64 |
| Trawl | 6 | | 8 |
| Hooks | 3,100 | | 3,000 |
| Trot, with baits or snoods | | 1 | |
| Baits or snoods | | 50 | |
| Pounds nets | 23 | 15 | 29 |
| Stop nets | 2 | 7 | |
| Square yards | 3,200 | 168 | |
| Fyke nets | 45 | 58 | 217 |
| Dip nets | | | 36 |
| Cast nets | 3 | 4 | |
| Pots— | | | |
| Eel | 127 | | 648 |
| Lobster | | | 185 |
| Spears | | | 6 |
| Dredges— | | | |
| Clam | 10 | | |
| Yards at mouth | 10 | | |
| Oyster | 30 | | 2 |
| Yards at mouth | 37 | | 2 |
| Tongs | 69 | | 11 |
| Rakes | 6 | | |
| Gaffs | | 1 | |
| By hand | 10 | | |

CATCH: BY COUNTIES

| Species | Kent | | New Castle | | Sussex | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 1,700 | $34 | | | 3,192,266 | $9,708 |
| Bluefish | | | | | 31,010 | 2,314 |
| Carp | 3,859 | 596 | 45,809 | $6,375 | 36,168 | 2,074 |
| Catfish and bullheads | 3,319 | 410 | 17,664 | 1,722 | 17,934 | 1,629 |
| Cod | 24,144 | 590 | | | 73,000 | 3,010 |
| Croaker | 190,250 | 5,798 | 750 | 84 | 933,930 | 22,822 |
| Eels | 10,367 | 1,064 | 12,506 | 1,500 | 70,716 | 8,432 |
| Flounders | | | | | 132,553 | 9,503 |
| Gizzard shad | | | 950 | 7 | | |
| King whiting or "kingfish" | 1,400 | 70 | | | 1,680 | 49 |
| Menhaden | | | | | 41,960,142 | 307,112 |
| Mullet | 1,000 | 50 | | | 63,800 | 4,250 |
| Scup | | | | | 27,000 | 2,160 |
| Sea bass | | | | | 20,250 | 1,620 |
| Shad | 7,201 | 1,282 | 36,479 | 7,774 | 10,766 | 1,818 |
| Spot | | | | | 146,761 | 8,250 |
| Squeteague or "sea trout," gray | 363,025 | 18,198 | 750 | 84 | 870,950 | 22,186 |
| Striped bass | 37,200 | 8,750 | 520 | 94 | 64,307 | 13,605 |
| Sturgeon | | | 15,313 | 6,253 | | |
| Suckers | 150 | 9 | | | | |
| Tautog | | | | | 74,000 | 2,300 |
| White perch | 51,825 | 6,853 | 2,825 | 294 | 155,321 | 27,968 |
| Yellow perch | 100 | 9 | 3,915 | 361 | 43,745 | 4,319 |
| Yellowtail | | | | | 2,940 | 84 |
| Crabs: | | | | | | |
| King | 968,760 | 1,265 | | | 23,800 | 4,850 |
| Soft | | | | | 11,750 | 2,620 |
| Lobsters | | | | | | |
| Clams: | | | | | | |
| Hard, public | 18,503 | 3,790 | | | | |
| Hard, private | 6,003 | 2,001 | | | | |
| Mussels | 19,500 | 1,875 | | | | |
| Oysters: | | | | | | |
| Market, public, fall | 86,675 | 8,068 | | | 79,792 | 10,874 |
| Market, private, spring | 28,120 | 3,967 | | | | |
| Market, private, fall | 210,263 | 20,002 | | | 23,250 | 3,000 |
| Seed, public, spring | 753,300 | 52,650 | | | 10,800 | 720 |
| Seed, public, fall | 64,800 | 3,795 | | | 10,574 | 706 |
| Turtles, snapper | 2,550 | 133 | 100 | 5 | | |
| Total | 2,854,014 | 150,259 | 137,581 | 24,553 | 48,089,205 | 477,983 |

*Industries related to the fisheries of Delaware, 1930*

TRANSPORTING IN KENT COUNTY

| | |
|---|---|
| Persons engaged on vessels | 5 |
| Vessels, motor | 1 |
| Net tonnage | 9 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Kent County | New Castle County | Sussex County | Total |
|---|---|---|---|---|
| Establishments | 4 | 5 | 9 | 18 |
| Persons engaged: | | | | |
| Proprietors | 8 | 5 | 10 | 23 |
| Salaried employees | 4 | 3 | 15 | 22 |
| Wage earners— | | | | |
| Average for season | 34 | 16 | 283 | 333 |
| Average for year | 18 | 9 | 103 | 130 |
| Paid to salaried employees | $7,752 | $6,500 | $28,840 | $43,092 |
| Paid to wage earners | 15,047 | 10,682 | 61,365 | 87,094 |
| Total, salaries and wages | 22,799 | 17,182 | 90,205 | 130,186 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Oysters, fresh-shucked | gallons | 78,080 | $153,584 |
| Miscellaneous [1] | | (2) | 603,675 |
| Total | | | 757,259 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 39]

| | | | |
|---|---|---|---|
| King crabs, dry scrap | tons | 178 | $7,104 |

[1] Includes shucked hard clams; marine and domestic shell products; canned sturgeon caviar; oyster-shell products; and menhaden products.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 5 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 39 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## VESSEL FISHERIES AT NEW YORK CITY AND GROTON, CONN.[7]

During 1931 fishing vessels of 5 net tons capacity or greater landed 51,854,000 pounds of fishery products at New York City and Groton, Conn. This is 9 per cent less than during the previous year. The landings consisted of bluefish, 1,788,000 pounds; cod, 5,368,000 pounds; flounders, 8,438,000 pounds; haddock, 28,502,000 pounds; halibut, 47,000 pounds; mackerel, 1,685,000 pounds; scup or porgies and sea bass, 696,000 pounds; tilefish, 2,782,000 pounds; squeteague or weakfish, 37,000 pounds; and miscellaneous species, 2,511,000 pounds.

[7] Statistics on the landings at New York City are collected by J. H. Matthews, executive secretary, Middle Atlantic Fisheries Association and forwarded to this bureau where they are combined with Groton landings. The statistics for the two ports are combined to avoid disclosure of individual enterprise.

### SHAD FISHERY OF THE HUDSON RIVER

The shad fishery of the Hudson River in 1931 was prosecuted by 252 fishermen, who used 25 motor boats, 107 other boats, 104 drift gill nets, having a total area of 315,298 square yards, 19 stake gill nets having a total area of 19,167 square yards, and 2 haul seines having a combined length of 349 yards. The total catch was 125,943 shad, having a weight of 414,611 pounds and a value to the fishermen of $49,781. This is an increase of slightly over 100 per cent in number and 49 per cent in value as compared with 1930. The average price per pound received by the fishermen in 1931 was about 12 cents as compared with 16 cents received in 1930.

About 73 per cent of the catch in number was taken with drift gill nets, 25 per cent with stake gill nets, and 1 per cent with haul seines. The remainder was taken incidentally with gear used mainly for other species of fish.

With the exception of some fishing with stake gill nets from one town in New Jersey, the fishing was prosecuted entirely from points in New York.

*Shad fishery of the Hudson River, 1931*

| Item | New York | | | New Jersey | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Pounds | Value | Number | Pounds | Value | Number | Pounds | Value |
| Fishermen: | | | | | | | | | |
| *On boats and shore—* | | | | | | | | | |
| Regular | 5 | | | 2 | | | 7 | | |
| Casual | 224 | | | 21 | | | 245 | | |
| Total | 229 | | | 23 | | | 252 | | |
| Boats: | | | | | | | | | |
| Motor | 22 | | | 3 | | | 25 | | |
| Other | 101 | | | 6 | | | 107 | | |
| Apparatus: | | | | | | | | | |
| Gill nets— | | | | | | | | | |
| Drift | 104 | | | | | | 104 | | |
| Square yards | 315,298 | | | | | | 315,298 | | |
| Stake | 15 | | | 4 | | | 19 | | |
| Square yards | 12,167 | | | 7,000 | | | 19,167 | | |
| Haul seines | 2 | | | | | | 2 | | |
| Length, yards | 349 | | | | | | 349 | | |
| Shad caught: | | | | | | | | | |
| With drift gill nets | 92,353 | 303,563 | $36,546 | | | | 92,353 | 303,563 | $36,546 |
| With stake gill nets | 9,975 | 33,795 | 3,587 | 21,900 | 72,000 | $8,941 | 31,875 | 105,795 | 12,528 |
| With haul seines | 1,270 | 3,815 | 437 | | | | 1,270 | 3,815 | 437 |
| Incidentally | 445 | 1,438 | 270 | | | | 445 | 1,438 | 270 |
| Total | 104,043 | 342,611 | 40,840 | 21,900 | 72,000 | 8,941 | 125,943 | 414,611 | 49,781 |

## FISHERIES OF THE CHESAPEAKE BAY STATES [8]

The yield of fishery products in the Chesapeake Bay States (Maryland and Virginia) during 1930 amounted to 316,392,924 pounds, valued at $11,472,050. This is an increase of 15 per cent in the catch but a decrease of 1 per cent in the value of the catch as compared with the quantity and its value for 1929. Of the total catch in 1930, 199,326,534 pounds, valued at $4,391,493, were fish; and 117,066,390

[8] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure" which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

pounds, valued at $7,080,557, were shellfish and miscellaneous products. These fisheries gave employment to 19,391 fishermen, or 5 per cent more than in 1929. Of the total number of fishermen employed during 1930, 2,579 regular fishermen were engaged on vessels, and 10,635 regular and 6,177 casual fishermen were employed in the shore and boat fisheries.

*Fisheries of the Chesapeake Bay States, 1930*

SUMMARY OF CATCH

| Product | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 16,680,888 | $873,469 | 182,645,646 | $3,518,024 | 199,326,534 | $4,391,493 |
| Shellfish, etc | 54,417,656 | 3,111,279 | 62,648,734 | 3,969,278 | 117,066,390 | 7,080,557 |
| Total | 71,098,544 | 3,984,748 | 245,294,380 | 7,487,302 | 316,392,924 | 11,472,050 |

OPERATING UNITS: BY STATES

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* |
| On vessels | 1,127 | 1,452 | 2,579 |
| On boats and shore— | | | |
| Regular | 4,917 | 5,718 | 10,635 |
| Casual | 2,483 | 3,694 | 6,177 |
| Total | 8,527 | 10,864 | 19,391 |
| Vessels: | | | |
| Steam | | 25 | 25 |
| Net tonnage | | 2,902 | 2,902 |
| Motor | 2 | 85 | 87 |
| Net tonnage | 13 | 1,440 | 1,453 |
| Sail | 252 | 27 | 279 |
| Net tonnage | 2,796 | 219 | 3,015 |
| Total vessels | 254 | 137 | 391 |
| Total net tonnage | 2,809 | 4,561 | 7,370 |
| Boats: | | | |
| Motor | 3,687 | 4,530 | 8,217 |
| Other | 2,435 | 3,168 | 5,603 |
| Accessory boats | 20 | 62 | 82 |
| Apparatus: | | | |
| Purse seines— | | | |
| Menhaden | | 31 | 31 |
| Length, yards | | 8,720 | 8,720 |
| Other | 18 | | 18 |
| Length, yards | 5,012 | | 5,012 |
| Haul seines | 188 | 187 | 375 |
| Length, yards | 34,784 | 59,430 | 94,214 |
| Gill nets— | | | |
| Anchor | 11 | 1 | 12 |
| Square yards | 2,845 | 9,600 | 12,445 |
| Drift | 303 | 652 | 955 |
| Square yards | 447,800 | 663,042 | 1,110,842 |
| Runaround | 5 | | 5 |
| Square yards | 5,920 | | 5,920 |
| Stake | 2,564 | 16,453 | 19,017 |
| Square yards | 151,660 | 607,190 | 758,850 |
| Lines— | | | |
| Hand | 18 | | 18 |
| Hooks | 36 | | 36 |
| Trot, with baits or snoods | 1,510 | 1,386 | 2,896 |
| Baits or snoods | 977,035 | 662,440 | 1,639,475 |
| Trot, with hooks | 22 | | 22 |
| Hooks | 3,450 | | 3,450 |
| Pound nets | 692 | 2,262 | 2,954 |
| Stop nets | 6 | | 6 |
| Square yards | 10,350 | | 10,350 |
| Fyke nets | 2,388 | 1,084 | 3,472 |
| Dip nets | 1,393 | 712 | 2,105 |

*Fisheries of the Chesapeake Bay States, 1930*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* |
| Cast nets | 3 | | 3 |
| Otter trawls | | 12 | 12 |
| Yards at mouth | | 358 | 358 |
| Pots, eel | 12,652 | 640 | 13,292 |
| Spears | 18 | | 18 |
| Scrapes | 1,232 | 618 | 1,850 |
| Yards at mouth | 1,232 | 618 | 1,850 |
| Dredges— | | | |
| Crab | | 102 | 102 |
| Yards at mouth | | 182 | 182 |
| Oyster | 710 | 256 | 966 |
| Yards at mouth | 898 | 293 | 1,191 |
| Scallop | | 924 | 924 |
| Yards at mouth | | 617 | 617 |
| Tongs | 4,849 | 4,820 | 9,669 |
| Rakes | 134 | 948 | 1,082 |
| Picks | 8 | 477 | 485 |

CATCH: BY STATES

| Species | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Alewives | 5,741,307 | $86,121 | 15,387,018 | $181,533 | 21,128,325 | $267,654 |
| Black bass | 19,179 | 3,263 | | | 19,179 | 3,263 |
| Bluefish | 267,611 | 26,031 | 230,006 | 16,182 | 497,617 | 42,213 |
| Bonito | 5,200 | 416 | 43,615 | 2,181 | 48,815 | 2,597 |
| Butterfish | 615,480 | 37,118 | 3,675,005 | 163,675 | 4,290,485 | 200,793 |
| Cabio, or crab eater | 200 | 10 | | | 200 | 10 |
| Carp | 226,240 | 22,038 | 242,750 | 11,757 | 468,990 | 33,795 |
| Catfish and bullheads | 398,983 | 19,500 | 407,787 | 15,471 | 806,770 | 34,971 |
| Cod | | | 50,103 | 1,200 | 50,103 | 1,200 |
| Croaker | 2,113,780 | 62,271 | 19,908,201 | 462,763 | 22,021,981 | 525,034 |
| Drum: | | | | | | |
| Black | 40,000 | 500 | 24,370 | 517 | 64,370 | 1,017 |
| Red or redfish | 16,000 | 327 | 36,200 | 1,437 | 52,200 | 1,764 |
| Eels | 314,361 | 27,115 | 74,765 | 6,626 | 389,126 | 33,741 |
| Flounders | 102,375 | 5,011 | 559,564 | 26,014 | 661,939 | 31,025 |
| Gizzard shad | 31,999 | 764 | 135,750 | 3,234 | 167,749 | 3,998 |
| Goldfish or "sand perch" | 12,665 | 621 | | | 12,665 | 621 |
| Hake | | | 1,422 | 42 | 1,422 | 42 |
| Harvestfish | | | 400 | 20 | 400 | 20 |
| Hickory shad | 6,550 | 229 | 83,900 | 2,828 | 90,450 | 3,057 |
| King whiting or "kingfish" | 1,600 | 128 | 2,989 | 144 | 4,589 | 272 |
| Mackerel | 800 | 48 | 47,874 | 4,747 | 48,674 | 4,795 |
| Menhaden | | | 115,841,600 | 767,210 | 115,841,600 | 767,210 |
| Mullet | 22,150 | 1,181 | 93,000 | 3,910 | 115,150 | 5,091 |
| Pigfish | 400 | 20 | 68,700 | 3,444 | 69,100 | 3,464 |
| Pike or pickerel | 10,918 | 2,019 | 80 | 20 | 10,998 | 2,039 |
| Pompano | 100 | 25 | 2,000 | 400 | 2,100 | 425 |
| Scup | 60,000 | 2,400 | 403,514 | 20,461 | 463,514 | 22,861 |
| Sea bass | 20,200 | 1,212 | 191,573 | 14,479 | 211,773 | 15,691 |
| Sea robin | 600 | 6 | | | 600 | 6 |
| Shad | 998,436 | 149,742 | 6,183,009 | 989,125 | 7,181,445 | 1,138,867 |
| Skates | 800 | 8 | 1,800 | 27 | 2,600 | 35 |
| Spanish mackerel | 8,200 | 1,010 | 50,150 | 6,480 | 58,350 | 7,490 |
| Spot | 126,295 | 6,569 | 2,492,935 | 124,874 | 2,619,230 | 131,443 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 3,753,647 | 172,258 | 15,512,389 | 580,708 | 19,266,036 | 752,966 |
| Spotted | 3,580 | 423 | 198,000 | 23,769 | 201,580 | 24,192 |
| Striped bass | 1,227,990 | 203,569 | 425,175 | 67,076 | 1,653,165 | 270,645 |
| Sturgeon | | | 4,590 | 1,380 | 4,590 | 1,380 |
| Tautog | 200 | 10 | 800 | 32 | 1,000 | 42 |
| Tomcod | 280 | 8 | | | 280 | 8 |
| White perch | 420,246 | 31,738 | 196,245 | 9,761 | 616,491 | 41,499 |
| Whiting | 5,000 | 200 | 21,707 | 897 | 26,707 | 1,097 |
| Yellow perch | 107,516 | 9,560 | 46,660 | 3,600 | 154,176 | 13,160 |
| Total | 16,680,888 | 873,469 | 182,645,646 | 3,518,024 | 199,326,534 | 4,391,493 |

*Fisheries of the Chesapeake Bay States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC. | | | | | | |
| Crabs: | | | | | | |
| Hard | 31,625,767 | $529,005 | 28,939,870 | $543,056 | 60,565,637 | $1,072,061 |
| Soft | 5,313,016 | 455,166 | 2,881,000 | 195,005 | 8,194,016 | 650,171 |
| Squid | 100,000 | 4,000 | 125,383 | 3,849 | 225,383 | 7,849 |
| Clams, hard, public | 80,8[illegible]0 | 40,400 | 1,212,736 | 391,771 | 1,293,536 | 432,171 |
| Oysters: [1] | | | | | | |
| Market, public, spring | 4,574,673 | 544,278 | 1,581,175 | 185,490 | 6,155,848 | 729,768 |
| Market, public, fall | 10,648,311 | 1,272,071 | 4,843,530 | 567,473 | 15,491,841 | 1,839,544 |
| Market, private, spring | 489,125 | 65,015 | 2,980,752 | 346,317 | 3,469,877 | 411,332 |
| Market, private, fall | 1,393,860 | 188,608 | 10,212,420 | 1,182,665 | 11,606,280 | 1,371,273 |
| Seed, public, spring | 188,404 | 11,072 | 2,509,715 | 125,483 | 2,698,119 | 136,555 |
| Seed, public, fall | | | 5,537,205 | 280,605 | 5,537,205 | 280,605 |
| Scallops, bay | | | 1,824,948 | 147,564 | 1,824,948 | 147,564 |
| Turtles, snapper | 1,600 | 64 | | | 1,600 | 64 |
| Terrapin, diamond-back | 2,100 | 1,600 | | | 2,100 | 1,600 |
| Total | 54,417,656 | 3,111,279 | 62,648,734 | 3,969,278 | 117,066,390 | 7,080,557 |
| Grand total | 71,098,544 | 3,984,748 | 245,294,380 | 7,487,302 | 316,392,924 | 11,472,050 |

PRODUCTION OF CERTAIN SHELLFISH IN NUMBERS AND BUSHELS

| Product | Maryland | | Virginia | | Total | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Crabs: | | | | | | |
| Hard ... number | 94,877,301 | $529,005 | 86,819,610 | $543,056 | 181,696,911 | $1,072,061 |
| Soft ... do | 15,939,048 | 455,166 | 8,643,000 | 195,005 | 24,582,048 | 650,171 |
| Clams, hard ... bushels | 10,100 | 40,400 | 151,592 | 391,771 | 161,692 | 432,171 |
| Oysters: | | | | | | |
| Market, public, spring ... do | 617,115 | 544,278 | 230,492 | 185,490 | 847,607 | 729,768 |
| Market, public, fall ... do | 1,436,437 | 1,272,071 | 706,054 | 567,473 | 2,142,491 | 1,839,544 |
| Market, private, spring ... do | 65,982 | 65,015 | 434,512 | 346,317 | 500,494 | 411,332 |
| Market, private, fall ... do | 188,029 | 188,608 | 1,488,691 | 1,182,665 | 1,676,720 | 1,371,273 |
| Seed, public, spring ... do | 37,081 | 11,072 | 501,943 | 125,483 | 539,624 | 136,555 |
| Seed, public, fall ... do | | | 1,107,441 | 280,605 | 1,107,441 | 280,605 |
| Scallops, bay ... do | | | 304,158 | 147,564 | 304,158 | 147,564 |

[1] Statistics on oyster used in this table are based on yields of 7.413 pounds of meats to the bushel for market oysters in Maryland, 6.86 pounds for market oysters in Virginia, and 5 pounds for seed oysters in both States. In reports for previous years all oysters in both States have been computed on the basis of a uniform yield of 7 pounds to the bushel.

*Industries related to the fisheries of the Chesapeake Bay States, 1930*

| Item | Maryland | Virginia | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Transporting: | | | |
| Persons engaged | 354 | 501 | 855 |
| Vessels— | | | |
| Motor | 151 | 253 | 404 |
| Net tonnage | 2,227 | 3,046 | 5,273 |
| Sail | 23 | 1 | 24 |
| Net tonnage | 707 | 30 | 737 |
| Total vessels | 174 | 254 | 428 |
| Total net tonnage | 2,934 | 3,076 | 6,010 |
| Wholesale and manufacturing: | | | |
| Establishments | 323 | 220 | 543 |
| Persons engaged— | | | |
| Proprietors | 509 | 303 | 812 |
| Salaried employees | 216 | 78 | 294 |
| Wage earners: | | | |
| Average for season | 6,121 | 4,448 | 10,569 |
| Average for year | 2,891 | 1,817 | 4,708 |
| Salaries and wages paid | $1,756,224 | $1,220,122 | $2,976,346 |
| Products [1] | $5,155,591 | $5,228,100 | $10,383,691 |
| Fishermen's manufactured products: | | | |
| Persons engaged | 52 | 479 | 531 |
| Products | $8,140 | $100,000 | $108,140 |

[1] These production figures are not comparable with those shown in previous bulletins, since packaged fresh and frozen fishery products are now included.

NOTE.—Of the total number of persons engaged in the preparation of fishermen's manufactured products, 528 have been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## MARYLAND

*Fisheries of Maryland, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | Haul seines | Gill nets | | | | Lines | | | Pound nets | Stop nets |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Runaround | Stake | Hand | Trot, with baits or snood | Trot, with hooks | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | |
| On vessels | 74 | | | | | | | | | | |
| On boats and shore— | | | | | | | | | | | |
| Regular | 46 | 294 | 18 | 74 | 14 | 74 | 18 | 1,317 | 10 | 510 | 1 |
| Casual | | 285 | 2 | 374 | 2 | 83 | | 160 | 3 | 176 | 10 |
| Total | 120 | 579 | 20 | 448 | 16 | 157 | 18 | 1,477 | 13 | 686 | 11 |
| Vessels: | | | | | | | | | | | |
| Motor—5 to 10 tons | 1 | | | | | | | | | | |
| Net tonnage | 7 | | | | | | | | | | |
| Sail— | | | | | | | | | | | |
| 5 to 10 tons | 1 | | | | | | | | | | |
| 11 to 20 tons | 2 | | | | | | | | | | |
| 21 to 30 tons | 6 | | | | | | | | | | |
| 31 to 40 tons | 1 | | | | | | | | | | |
| Total | 10 | | | | | | | | | | |
| Net tonnage | 222 | | | | | | | | | | |
| Total vessels | 11 | | | | | | | | | | |
| Total net tonnage | 229 | | | | | | | | | | |
| Boats: | | | | | | | | | | | |
| Motor | 20 | 90 | 9 | 166 | 5 | 64 | 9 | 1,233 | | 236 | 3 |
| Other | 1 | 186 | 1 | 95 | 5 | 50 | | 208 | 13 | 263 | 4 |
| Accessory boats | 20 | | | | | | | | | | |
| Apparatus: | | | | | | | | | | | |
| Number | 18 | 188 | 11 | 303 | 5 | 2,564 | 18 | 1,510 | 22 | 692 | 6 |
| Length, yards | 5,012 | 34,784 | | | | | | | | | |
| Square yards | | | 2,845 | 447,800 | 5,920 | 151,660 | | | | | 10,350 |
| Hooks, baits, or snoods | | | | | | | 36 | 977,035 | 3,450 | | |

*Fisheries of Maryland, 1930*—Continued

OPERATING UNITS: By gear—Continued

| Item | Fyke nets | Dip nets | Cast nets | Pots, eel | Spears | Scrapes | Dredges, oyster | Tongs | Rakes | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | | |
| On vessels | | | | | | | 1,085 | 3 | | | | 1,127 |
| On boats and shore— | | | | | | | | | | | | |
| Regular | 35 | 991 | | 123 | 18 | 640 | 201 | 3,345 | 98 | | 16 | 4,917 |
| Casual | 107 | 408 | 3 | 42 | | 22 | | 1,114 | 36 | 8 | 35 | 2,483 |
| Total | 142 | 1,399 | 3 | 165 | 18 | 662 | 1,286 | 4,462 | 134 | 8 | 51 | 8,527 |
| Vessels: | | | | | | | | | | | | |
| Motor—5 to 10 tons | | | | | | | | 1 | | | | 2 |
| Net tonnage | | | | | | | | 6 | | | | 13 |
| Sail— | | | | | | | | | | | | |
| 5 to 10 tons | | | | | | | 194 | | | | | 194 |
| 11 to 20 tons | | | | | | | 23 | | | | | 24 |
| 21 to 30 tons | | | | | | | 18 | | | | | 21 |
| 31 to 40 tons | | | | | | | 6 | | | | | 7 |
| 41 to 50 tons | | | | | | | 4 | | | | | 4 |
| 51 to 60 tons | | | | | | | 2 | | | | | 2 |
| Total | | | | | | | 247 | | | | | 252 |
| Net tonnage | | | | | | | 2,676 | | | | | 2,796 |
| Total vessels | | | | | | | 247 | 1 | | | | 254 |
| Total net tonage | | | | | | | 2,676 | 6 | | | | 2,809 |
| Boats: | | | | | | | | | | | | |
| Motor | 68 | 530 | | 138 | 12 | | 20 | 2,579 | 48 | | 5 | 3,687 |
| Other | 60 | 961 | 3 | 6 | 6 | 584 | 88 | 368 | 37 | 8 | 46 | 2,435 |
| Accessory boats | | | | | | | | | | | | 20 |
| Apparatus: | | | | | | | | | | | | |
| Number | 2,388 | 1,393 | 3 | 12,652 | 18 | 1,232 | 710 | 4,849 | 134 | 8 | | |
| Yards at mouth | | | | | | 1,232 | 898 | | | | | |

CATCH: By gear

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 101,200 | $1,524 | | | 46,809 | $724 |
| Black bass | | | 11,475 | 1,880 | | | | |
| Bluefish | 88,136 | $8,818 | 31,300 | 2,830 | | | | |
| Carp | | | 149,593 | 14,210 | | | | |
| Catfish and bullheads | | | 114,825 | 5,554 | | | | |
| Croaker | 73,218 | 1,957 | 620,200 | 20,982 | | | 8,400 | 252 |
| Eels | | | 1,960 | 149 | | | | |
| Flounders | | | 9,700 | 507 | | | | |
| Gizzard shad | | | 2,100 | 50 | | | | |
| Goldfish or "sand perch" | | | 9,665 | 491 | | | | |
| Hickory shad | | | | | | | 500 | 20 |
| Mullet | | | 1,300 | 74 | 18,000 | $916 | | |
| Pike or pickerel | | | 2,685 | 527 | | | | |
| Shad | | | 2,837 | 397 | | | 225,625 | 33,602 |
| Spot | 2,700 | 177 | 44,000 | 2,697 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 170,746 | 12,220 | 87,650 | 5,836 | | | 200 | 20 |
| Spotted | | | 2,400 | 288 | | | | |
| Striped bass | 310,607 | 47,364 | 219,903 | 40,315 | 1,200 | 240 | 170,212 | 28,533 |
| White perch | | | 107,085 | 8,149 | 2,000 | 200 | 11,300 | 885 |
| Yellow perch | | | 15,835 | 1,431 | | | 400 | 40 |
| Crabs, soft | | | 48,314 | 5,566 | | | | |
| Total | 645,407 | 70,536 | 1,584,027 | 113,457 | 21,200 | 1,356 | 463,446 | 64,076 |

*Fisheries of Maryland, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets—Continued | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | Hand | | Trot, with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 18,600 | $335 | | | | |
| Bluefish | 49,800 | $4,784 | | | 40,000 | $4,000 | | |
| Bonito | | | | | 2,000 | 160 | | |
| Catfish and bullheads | | | 200 | 10 | | | | |
| Croaker | | | 400 | 12 | 5,800 | 174 | | |
| Flounders | | | | | 6,400 | 320 | | |
| Gizzard shad | | | 684 | 27 | | | | |
| Mullet | | | 300 | 24 | | | | |
| Scup or porgy | | | | | 22,400 | 896 | | |
| Sea bass | | | | | 20,000 | 1,200 | | |
| Shad | | | 135,211 | 20,398 | | | | |
| Spanish mackerel | 200 | 50 | | | | | | |
| Squeteagues or "sea trout," gray | | | 1,500 | 120 | 32,000 | 1,600 | | |
| Striped bass | 2,500 | 450 | 122,000 | 18,839 | | | | |
| White perch | | | 10,800 | 820 | | | | |
| Yellow perch | | | 1,200 | 120 | | | | |
| Crabs, hard | | | | | | | 30,315,632 | $505,730 |
| Total | 52,500 | 5,284 | 290,895 | 40,705 | 128,600 | 8,350 | 30,315,632 | 505,730 |

| Species | Lines—Contd. | | Pound nets | | Stop nets | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | Trot, with hooks | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 5,574,298 | $83,530 | | | 400 | $8 |
| Black bass | | | 250 | 46 | | | 7,454 | 1,337 |
| Bluefish | | | 58,375 | 5,599 | | | | |
| Bonito | | | 3,200 | 256 | | | | |
| Butterfish | | | 615,480 | 37,118 | | | | |
| Cabio or crab eater | | | 200 | 10 | | | | |
| Carp | | | 14,822 | 1,100 | 31,800 | $3,636 | 6,025 | 572 |
| Catfish and bullheads | 8,300 | $415 | 137,372 | 6,625 | | | 138,286 | 6,896 |
| Croaker | | | 1,405,462 | 38,869 | | | 300 | 25 |
| Drum: | | | | | | | | |
| Black | | | 40,000 | 500 | | | | |
| Red or redfish | | | 16,000 | 327 | | | | |
| Eels | 1,840 | 147 | 19,014 | 1,561 | | | 23,087 | 2,057 |
| Flounders | | | 86,275 | 4,184 | | | | |
| Gizzard shad | | | 26,915 | 633 | | | 2,300 | 54 |
| Goldfish or "sand perch" | | | 400 | 16 | | | 2,600 | 114 |
| Hickory shad | | | 5,650 | 193 | | | 400 | 16 |
| King whiting or "kingfish" | | | 1,600 | 128 | | | | |
| Mackerel | | | 800 | 48 | | | | |
| Mullet | | | 1,550 | 88 | | | 1,000 | 79 |
| Pigfish | | | 400 | 20 | | | | |
| Pike or pickerel | | | 594 | 117 | | | 7,639 | 1,375 |
| Pompano | | | 100 | 25 | | | | |
| Scup or porgy | | | 37,600 | 1,504 | | | | |
| Sea bass | | | 200 | 12 | | | | |
| Sea robin | | | 600 | 6 | | | | |
| Shad | | | 634,763 | 95,345 | | | | |
| Skates | | | 800 | 8 | | | | |
| Spanish mackerel | | | 8,000 | 960 | | | | |
| Spot | | | 79,595 | 3,695 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 3,461,551 | 152,462 | | | | |
| Spotted | | | 1,180 | 135 | | | | |
| Striped bass | | | 399,268 | 67,392 | | | 2,300 | 436 |
| Tautog | | | 200 | 10 | | | | |
| Tomcod | | | 280 | 8 | | | | |
| White perch | | | 198,740 | 15,063 | | | 90,321 | 6,621 |
| Whiting | | | 5,000 | 200 | | | | |
| Yellow perch | | | 14,505 | 1,319 | | | 75,576 | 6,650 |
| Squid | | | 100,000 | 4,000 | | | | |
| Turtles, snapper | 1,500 | 60 | | | | | 100 | 4 |
| Total | 11,640 | 622 | 12,951,039 | 523,112 | 31,800 | 3,636 | 357,788 | 26,244 |

*Fisheries of Maryland, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Dip nets | | Cast nets | | Pots, eel | | Spears | | Scrapes | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Carp | | | 24,000 | $2,520 | | | | | | |
| Eels | | | | | 251,860 | $21,957 | 16,600 | $1,244 | | |
| Crabs: | | | | | | | | | | |
| Hard | 89,650 | $1,585 | | | | | | | 1,220,485 | $21,690 |
| Soft | 2,064,758 | 179,236 | | | | | | | 3,199,944 | 270,364 |
| Total | 2,154,408 | 180,821 | 24,000 | 2,520 | 251,860 | 21,957 | 16,600 | 1,244 | 4,420,429 | 292,054 |

| Species | Dredges, oyster | | Tongs | | Rakes | | Picks | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, hard public | | | 72,360 | $36,180 | 6,400 | $3,200 | 720 | $360 | 1,320 | $660 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | 1,127,087 | $145,247 | 3,447,586 | 399,031 | | | | | | |
| Market public, fall | 2,683,550 | 347,213 | 7,964,761 | 924,858 | | | | | | |
| Market, private, spring | 29,652 | 4,800 | 452,060 | 59,215 | 7,413 | 1,000 | | | | |
| Market, private, fall | 51,150 | 7,780 | 1,320,470 | 177,828 | 22,240 | 3,000 | | | | |
| Seed, public, spring | | | 188,404 | 11,072 | | | | | | |
| Terrapin, diamond-back | | | | | | | | | 2,100 | 1,600 |
| Total | 3,891,439 | 505,040 | 13,445,641 | 1,608,184 | 36,053 | 7,200 | 720 | 360 | 3,420 | 2,260 |

OPERATING UNITS: BY COUNTIES

| Item | Anne Arundel | Baltimore | Calvert | Caroline | Cecil | Charles | Dorchester | Harford |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 7 | 110 | 20 | | | | 397 | |
| On boats and shore— | | | | | | | | |
| Regular | 384 | | 129 | 3 | 9 | 98 | 730 | |
| Casual | 370 | 46 | 286 | 45 | 102 | 278 | 192 | 52 |
| Total | 761 | 156 | 435 | 48 | 111 | 376 | 1,319 | 52 |
| Vessels: | | | | | | | | |
| Motor—5 to 10 tons | 2 | | | | | | | |
| Net tonnage | 13 | | | | | | | |
| Sail— | | | | | | | | |
| 5 to 10 tons | | | 2 | | | | 88 | |
| 11 to 20 tons | | 3 | | | | | 4 | |
| 21 to 30 tons | | 7 | 1 | | | | 3 | |
| 31 to 40 tons | | 4 | | | | | | |
| 41 to 50 tons | | 3 | | | | | | |
| 51 to 60 tons | | 1 | 1 | | | | | |
| Total | | 18 | 4 | | | | 95 | |
| Net tonnage | | 545 | 88 | | | | 786 | |
| Total vessels | 2 | 18 | 4 | | | | 95 | |
| Total net tonnage | 13 | 545 | 88 | | | | 786 | |
| Boats: | | | | | | | | |
| Motor | 407 | 17 | 183 | 6 | 44 | 141 | 508 | 31 |
| Other | 139 | 20 | 148 | 21 | 41 | 62 | 258 | 11 |
| Accessory boats | | 8 | | | | | | |
| Apparatus: | | | | | | | | |
| Purse seines | 2 | 4 | | | | | | |
| Length, yards | 600 | 1,054 | | | | | | |
| Haul seines | 50 | 6 | 17 | 4 | 9 | 31 | 6 | 2 |
| Length, yards | 1,688 | 1,400 | 3,675 | 900 | 2,000 | 4,655 | 1,850 | 1,400 |

*Fisheries of Maryland, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Anne Arundel | Baltimore | Calvert | Caroline | Cecil | Charles | Dorchester | Harford |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | |
| Gill nets— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Anchor | | | 2 | | | | | |
| Square yards | | | 1,200 | | | | | |
| Drift | | | 1 | 14 | 26 | 50 | 6 | 76 |
| Square yards | | | 600 | 9,200 | 44,120 | 181,320 | 2,400 | 38,000 |
| Runaround | | | | | 1 | | 2 | |
| Square yards | | | | | 600 | | 1,320 | |
| Stake | | 120 | 8 | | | 470 | 20 | 12 |
| Square yards | | 10,150 | 240 | | | 30,515 | 530 | 540 |
| Lines— | | | | | | | | |
| Trot, with baits or snoods | 111 | 26 | 124 | | | 27 | 331 | |
| Baits or snoods | 64,650 | 14,700 | 57,600 | | | 25,200 | 253,985 | |
| Trot, with hooks | | | 10 | 2 | | | | |
| Hooks | | | 250 | 200 | | | | |
| Pound nets | 32 | 10 | 38 | 14 | 28 | 54 | 160 | 2 |
| Stop nets | | | | 4 | 2 | | | |
| Square yards | | | | 8,100 | 2,250 | | | |
| Fyke sets | 174 | 246 | | 60 | 758 | 21 | 16 | 92 |
| Dip nets | 47 | | 95 | | | 12 | 152 | |
| Pots, eel | 215 | 450 | | | 374 | 18 | 4,124 | 600 |
| Scrapes | | | | | | | 72 | |
| Yards at mouth | | | | | | | 72 | |
| Dredges, oyster | | 36 | 8 | | | | 282 | |
| Yards at mouth | | 58 | 12 | | | | 358 | |
| Tongs | 646 | | 311 | | | 185 | 519 | |

| Item | Kent | Prince Georges | Queen Annes | St. Marys | Somerset | Talbot | Wicomico | Worcester |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 35 | | | 18 | 416 | 124 | | |
| On boats and shore— | | | | | | | | |
| Regular | 418 | 2 | 588 | 415 | 942 | 672 | 303 | 224 |
| Casual | 143 | 39 | 157 | 411 | 97 | 74 | 92 | 99 |
| Total | 596 | 41 | 745 | 844 | 1,455 | 870 | 395 | 323 |
| Vessels: | | | | | | | | |
| Sail— | | | | | | | | |
| 5 to 10 tons | | | | 2 | 77 | 25 | | |
| 11 to 20 tons | 1 | | | 1 | 14 | 1 | | |
| 21 to 30 tons | 3 | | | 1 | 5 | 1 | | |
| 31 to 40 tons | 1 | | | | 2 | | | |
| 41 to 50 tons | | | | | 1 | | | |
| Total | 5 | | | 4 | 99 | 27 | | |
| Net tonnage | 120 | | | 53 | 999 | 205 | | |
| Boats: | | | | | | | | |
| Motor | 262 | 4 | 379 | 330 | 565 | 459 | 200 | 151 |
| Other | 116 | 21 | 110 | 442 | 814 | 129 | 37 | 66 |
| Accessory boats | 10 | | | | | 2 | | |
| Apparatus: | | | | | | | | |
| Purse seines | 5 | | | | | 7 | | |
| Length, yards | 1,316 | | | | | 2,042 | | |
| Haul seines | 22 | 8 | 12 | 7 | 5 | 3 | 1 | 5 |
| Length, yards | 4,493 | 965 | 4,536 | 2,190 | 3,500 | 977 | 480 | 75 |
| Gill nets— | | | | | | | | |
| Anchor | | | | | | | | 9 |
| Square yards | | | | | | | | 1,645 |
| Drift | 65 | 5 | | | 5 | 14 | 29 | 12 |
| Square yards | 111,000 | 5,100 | | | 6,000 | 21,660 | 21,200 | 7,200 |
| Runaround | | | | | 2 | | | |
| Square yards | | | | | 4,000 | | | |
| Stake | 1,460 | | 126 | 4 | 156 | | 188 | |
| Square yards | 83,820 | | 13,390 | 935 | 4,800 | | 6,740 | |
| Lines— | | | | | | | | |
| Hand | | | | | | | | 18 |
| Hooks | | | | | | | | 36 |

*Fisheries of Maryland, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Kent | Prince Georges | Queen Annes | St. Marys | Somerset | Talbot | Wicomico | Worcester |
|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | | |
| Lines—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Trot, with baits or snoods | 245 | | 146 | 133 | 63 | 251 | 4 | 49 |
| Baits or snoods | 99,600 | | 78,600 | 94,000 | 60,000 | 187,800 | 2,250 | 38,650 |
| Trot, with hooks | 10 | | | | | | | |
| Hooks | 3,000 | | | | | | | |
| Pound nets | 37 | 8 | 17 | 77 | 61 | 96 | 20 | 38 |
| Fyke nets | 727 | 71 | 119 | | | 44 | 12 | 48 |
| Dip nets | 28 | | 91 | 258 | 623 | 82 | | 5 |
| Cast nets | 3 | | | | | | | |
| Pots, eel | 336 | 30 | 1,110 | | 320 | 4,835 | | 240 |
| Spears | | | | | | 18 | | |
| Scrapes | | | | | 1,160 | | | |
| Yards at mouth | | | | | 1,160 | | | |
| Dredges, oyster | | | | 12 | 278 | 54 | | 40 |
| Yards at mouth | | | | 12 | 351 | 73 | | 34 |
| Tongs | 366 | | 659 | 938 | 203 | 545 | 331 | 146 |
| Rakes | | | | | | | | 134 |
| Picks | | | | | | | | 8 |

CATCH: BY COUNTIES

| Species | Anne Arundel | | Baltimore | | Calvert | | Caroline | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 406,494 | $5,250 | 53,000 | $1,560 | 450,800 | $5,641 | 10,800 | $166 |
| Black bass | 600 | 120 | 200 | 40 | | | 100 | 18 |
| Bluefish | 31,425 | 2,968 | 19,250 | 1,929 | 200 | 20 | | |
| Butterfish | 80 | 8 | | | 200 | 30 | | |
| Carp | 13,022 | 1,293 | 19,900 | 1,990 | 6,400 | 512 | 11,700 | 1,146 |
| Catfish and bullheads | 20,388 | 918 | 56,436 | 2,822 | 17,300 | 865 | 12,900 | 645 |
| Croaker | 114,234 | 3,372 | 3,124 | 94 | 111,600 | 2,486 | 2,000 | 60 |
| Eels | 11,344 | 1,244 | 11,900 | 1,190 | 50 | 5 | 2,000 | 160 |
| Flounders | 8,081 | 358 | 1,000 | 53 | 2,900 | 174 | | |
| Gizzard shad | 17,975 | 386 | | | | | | |
| Mullet | | | | | 400 | 20 | | |
| Pike or pickerel | 3,354 | 671 | 400 | 100 | 150 | 30 | | |
| Shad | 25,969 | 3,894 | 500 | 75 | 71,800 | 10,526 | 1,150 | 172 |
| Spot | 18,795 | 968 | 1,200 | 72 | 1,600 | 86 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 149,201 | 9,467 | 25,259 | 2,020 | 51,100 | 3,452 | 3,400 | 272 |
| Spotted | 200 | 24 | | | | | | |
| Striped bass | 68,340 | 13,276 | 115,455 | 18,720 | 41,450 | 7,559 | 12,500 | 2,500 |
| White perch | 11,590 | 993 | 23,600 | 1,744 | 25,800 | 2,104 | 14,650 | 938 |
| Yellow perch | 6,700 | 670 | 8,000 | 724 | 800 | 80 | 1,500 | 150 |
| Crabs: | | | | | | | | |
| Hard | 2,770,000 | 56,620 | 132,000 | 3,960 | 671,400 | 10,071 | | |
| Soft | 42,699 | 5,401 | | | 150,927 | 13,584 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 825,200 | 107,538 | 136,636 | 18,432 | 206,660 | 28,098 | | |
| Market, public, fall | 1,343,517 | 173,938 | 252,205 | 34,022 | 482,638 | 71,617 | | |
| Market, private, spring | | | | | 103,693 | 13,988 | | |
| Market, private, fall | | | | | 219,625 | 32,589 | | |
| Turtles, snapper | | | | | | | 1,600 | 64 |
| Total | 5,889,208 | 389,377 | 860,065 | 89,547 | 2,617,493 | 203,537 | 74,300 | 6,291 |

*Fisheries of Maryland, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Cecil | | Charles | | Dorchester | | Harford | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 112,000 | $1,680 | 16,000 | $400 | 908,008 | $13,660 | 223,000 | $3,945 |
| Black bass | 4,294 | 774 | 4,675 | 809 | | | | |
| Bluefish | | | 600 | 60 | 25,400 | 2,184 | | |
| Carp | 59,530 | 6,709 | 44,450 | 3,185 | 3,713 | 321 | 2,800 | 280 |
| Catfish and bullheads | 52,550 | 2,627 | 67,835 | 3,006 | 27,034 | 1,352 | 5,700 | 285 |
| Croaker | | | 6,550 | 405 | 201,878 | 5,238 | | |
| Eels | 19,937 | 1,994 | 2,410 | 160 | 65,240 | 5,995 | 10,200 | 1,020 |
| Flounders | | | 400 | 32 | 25,294 | 1,095 | | |
| Gizzard shad | 2,100 | 63 | 7,500 | 138 | 3,524 | 141 | | |
| Goldfish or "sand perch" | | | 9,765 | 500 | | | | |
| Hickory shad | 1,000 | 35 | | | | | | |
| Mullet | | | 1,700 | 121 | 400 | 32 | | |
| Pike or pickerel | 1,659 | 313 | 325 | 63 | | | 200 | 50 |
| Shad | 87,032 | 12,527 | 23,805 | 3,833 | 120,099 | 17,990 | 42,016 | 5,882 |
| Spot | | | 600 | 12 | 12,500 | 731 | | |
| Squeteagues or "sea trout", gray | | | 19,100 | 1,530 | 41,300 | 2,478 | | |
| Striped bass | 26,306 | 4,734 | 56,985 | 7,511 | 116,088 | 19,484 | 11,800 | 2,200 |
| White perch | 48,621 | 3,699 | 41,445 | 3,266 | 88,500 | 6,456 | 8,200 | 656 |
| Yellow perch | 10,676 | 908 | 8,665 | 772 | | | 3,200 | 256 |
| Crabs: | | | | | | | | |
| Hard | | | 585,200 | 8,758 | 9,639,532 | 151,502 | | |
| Soft | | | 1,200 | 150 | 446,409 | 37,254 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 16,160 | 2,143 | 827,120 | 99,755 | | |
| Market, public, fall | | | 97,885 | 15,477 | 2,010,546 | 247,113 | | |
| Market, private, spring | | | 8,354 | 1,240 | 84,382 | 10,308 | | |
| Market, private, fall | | | 74,397 | 12,043 | 180,136 | 23,900 | | |
| Total | 425,705 | 36,063 | 1,096,006 | 65,614 | 14,827,103 | 646,989 | 307,116 | 14,574 |

| Species | Kent | | Prince Georges | | Queen Annes | | St. Marys | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 400,509 | $6,008 | 800 | $16 | 67,200 | $1,024 | 526,600 | $8,433 |
| Black bass | 1,310 | 202 | 8,000 | 1,300 | | | | |
| Bluefish | 29,486 | 2,853 | | | 16,300 | 1,630 | 7,550 | 707 |
| Butterfish | 1,500 | 150 | | | 1,200 | 120 | | |
| Carp | 42,000 | 4,616 | 13,825 | 1,232 | 2,500 | 238 | 600 | 48 |
| Catfish and bullheads | 58,140 | 2,907 | 18,500 | 844 | 19,500 | 980 | 200 | 8 |
| Croaker | 85,294 | 2,559 | | | 102,400 | 3,682 | 60,800 | 1,707 |
| Eels | 10,410 | 833 | 2,950 | 274 | 21,400 | 1,708 | 800 | 64 |
| Flounders | 1,400 | 70 | | | 2,000 | 116 | 5,200 | 339 |
| Goldfish or "sand perch" | | | 2,900 | 121 | | | | |
| Hickory shad | | | | | | | 2,850 | 86 |
| Mullet | | | 850 | 52 | | | | |
| Pike or pickerel | 3,430 | 522 | 1,100 | 220 | 300 | 50 | | |
| Shad | 206,183 | 30,926 | 2,839 | 469 | 16,000 | 2,400 | 97,666 | 15,185 |
| Spot | 12,600 | 756 | | | 12,400 | 850 | 4,100 | 169 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 275,487 | 17,220 | 3,100 | 248 | 29,100 | 2,451 | 41,000 | 2,124 |
| Spotted | | | | | | | 180 | 15 |
| Striped bass | 474,183 | 73,139 | 5,400 | 850 | 60,600 | 10,674 | 98,300 | 19,588 |
| White perch | 65,700 | 4,645 | 8,600 | 620 | 21,340 | 1,696 | 19,750 | 1,647 |
| Yellow perch | 31,080 | 2,586 | 7,170 | 660 | 16,500 | 1,496 | 3,125 | 248 |
| Crabs: | | | | | | | | |
| Hard | 2,684,800 | 40,272 | | | 1,804,200 | 27,263 | 1,432,000 | 26,280 |
| Soft | 33,941 | 4,073 | | | 56,700 | 6,329 | 98,510 | 10,820 |
| Oysters: | | | | | | | | |
| Market, public, spring | 290,775 | 23,074 | | | 627,696 | 63,227 | 126,132 | 13,375 |
| Market, public, fall | 850,086 | 75,322 | | | 1,539,495 | 154,916 | 549,437 | 59,503 |
| Market, private, spring | | | | | | | 9,637 | 1,145 |
| Market, private, fall | | | | | 8,896 | 960 | 41,142 | 5,000 |
| Seed, public, spring | 188,404 | 11,072 | | | | | | |
| Total | 5,746,718 | 303,805 | 76,034 | 6,906 | 4,425,727 | 281,810 | 3,125,579 | 166,491 |

*Fisheries of Maryland, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Somerset | | Talbot | | Wicomico | | Worcester | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 482,000 | $6,830 | 1,997,896 | $29,974 | 74,200 | $1,294 | 12,000 | $240 |
| Bluefish | 42,200 | 4,196 | 46,400 | 4,604 | 400 | 40 | 48,400 | 4,840 |
| Bonito | | | | | | | 5,200 | 416 |
| Butterfish | 10,000 | 600 | | | 2,500 | 210 | 600,000 | 36,000 |
| Cabio or crab eater | | | | | | | 200 | 10 |
| Carp | | | 2,600 | 212 | 2,400 | 192 | 800 | 64 |
| Catfish and bullheads | 6,200 | 310 | 16,400 | 936 | 16,100 | 805 | 3,800 | 190 |
| Croaker | 611,100 | 20,344 | 302,000 | 6,940 | 106,200 | 3,186 | 406,600 | 12,198 |
| Drum: | | | | | | | | |
| Black | | | | | | | 40,000 | 500 |
| Red or redfish | 1,000 | 27 | | | | | 15,000 | 300 |
| Eels | 5,800 | 580 | 126,400 | 10,010 | 200 | 16 | 23,320 | 1,862 |
| Flounders | 10,100 | 462 | 2,400 | 132 | 3,800 | 190 | 39,800 | 1,990 |
| Gizzard shad | 900 | 36 | | | | | | |
| Hickory shad | 1,500 | 60 | | | 1,200 | 48 | | |
| King whiting or "kingfish" | | | | | | | 1,600 | 128 |
| Mackerel | | | | | | | 800 | 48 |
| Mullet | | | | | 800 | 40 | 18,000 | 916 |
| Pigfish | | | | | | | 400 | 20 |
| Pompano | | | | | | | 100 | 25 |
| Scup or porgy | | | | | | | 60,000 | 2,400 |
| Sea bass | | | | | | | 20,200 | 1,212 |
| Sea robin | | | | | | | 600 | 6 |
| Shad | 110,800 | 16,619 | 163,701 | 24,555 | 18,876 | 3,189 | 10,000 | 1,500 |
| Skates | | | | | | | 800 | 8 |
| Spanish mackerel | 200 | 50 | | | | | 8,000 | 960 |
| Spot | 9,600 | 476 | 2,700 | 177 | 8,200 | 492 | 42,000 | 1,680 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 110,100 | 5,606 | 146,200 | 10,160 | 22,100 | 1,432 | 2,837,200 | 113,808 |
| Spotted | 3,200 | 384 | | | | | | |
| Striped bass | 17,000 | 3,064 | 109,443 | 17,697 | 13,740 | 2,513 | 400 | 60 |
| Tautog | | | | | | | 200 | 10 |
| Tomcod | | | | | | | 280 | 8 |
| White perch | 10,750 | 702 | 21,700 | 1,774 | 10,000 | 798 | | |
| Whiting | | | | | | | 5,000 | 200 |
| Yellow perch | | | 10,100 | 1,010 | | | | |
| Crabs: | | | | | | | | |
| Hard | 3,013,635 | 54,906 | 7,871,400 | 128,941 | 71,600 | 1,432 | 950,000 | 19,000 |
| Soft | 4,392,387 | 369,875 | 71,563 | 5,998 | | | 18,680 | 1,682 |
| Squid | | | | | | | 100,000 | 4,000 |
| Clams, hard, public | | | | | | | 80,800 | 40,400 |
| Oysters: | | | | | | | | |
| Market, public, spring | 537,635 | 73,416 | 783,495 | 88,623 | 197,164 | 26,597 | | |
| Market, public, fall | 1,267,119 | 172,852 | 1,702,640 | 192,747 | 552,743 | 74,564 | | |
| Market, private, spring | 69,193 | 9,334 | | | 75,983 | 8,200 | 137,883 | 20,800 |
| Market, private, fall | 153,197 | 20,666 | 74,871 | 9,090 | 269,463 | 29,080 | 372,133 | 55,280 |
| Terrapin, diamond-back | 1,800 | 1,300 | 300 | 300 | | | | |
| Total | 10,867,416 | 762,795 | 13,452,209 | 533,880 | 1,447,669 | 154,308 | 5,860,196 | 322,761 |

*Industries related to the fisheries of Maryland, 1930*

TRANSPORTING

| Item | Anne Arundel County | Baltimore County | Calvert County | Dorchester County | St. Marys County | Somerset County | Talbot County | Total |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 49 | 20 | 19 | 76 | 9 | 153 | 28 | 354 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 15 | 1 | 5 | 13 | 1 | 31 | 7 | 73 |
| 11 to 20 tons | 6 | 1 | 1 | 9 | | 23 | 4 | 44 |
| 21 to 30 tons | 2 | | 2 | 3 | | 12 | 2 | 21 |
| 31 to 40 tons | | | 1 | 3 | | 5 | | 9 |
| 41 to 50 tons | | 1 | | 3 | | | | 4 |
| Total | 23 | 3 | 9 | 31 | 1 | 71 | 13 | 151 |
| Net tonnage | 260 | 75 | 126 | 554 | 9 | 1,045 | 158 | 2,227 |
| Sail— | | | | | | | | |
| 5 to 10 tons | | | | 1 | | 1 | 1 | 3 |
| 11 to 20 tons | 1 | | | 1 | 1 | 3 | | 6 |
| 21 to 30 tons | | | | 2 | 2 | | 1 | 5 |
| 31 to 40 tons | | | | 1 | | 1 | | 2 |
| 41 to 50 tons | | 1 | | 1 | | 1 | | 3 |
| 51 to 60 tons | | 2 | | | | | | 2 |
| 71 to 80 tons | | 1 | | | | | | 1 |
| 81 to 90 tons | | 1 | | | | | | 1 |
| Total | 1 | 5 | | 6 | 3 | 6 | 2 | 23 |
| Net tonnage | 12 | 303 | | 152 | 63 | 146 | 31 | 707 |
| Total vessels | 24 | 8 | 9 | 37 | 4 | 77 | 15 | 174 |
| Total net tonnage | 272 | 378 | 126 | 706 | 72 | 1,191 | 189 | 2,934 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Anne Arundel County | Baltimore County | Calvert County | Caroline and Dorchester Counties | Cecil and Harford Counties | Kent County | Queen Annes County |
|---|---|---|---|---|---|---|---|
| Establishments | 11 | 60 | 9 | 35 | 7 | 11 | 14 |
| Persons engaged: | | | | | | | |
| Proprietors | 17 | 81 | 11 | 47 | 6 | 15 | 17 |
| Salaried employees | 4 | 133 | 1 | 22 | 3 | 2 | |
| Wage earners— | | | | | | | |
| Average for season | 293 | 714 | 137 | 1,552 | 143 | 108 | 280 |
| Average for year | 180 | 363 | 79 | 633 | 27 | 54 | 153 |
| Paid to salaried employees | $6,293 | $210,705 | $1,120 | $36,028 | $760 | $2,340 | |
| Paid to wage earners | 79,773 | 334,519 | 32,810 | 302,476 | 10,980 | 26,336 | $59,255 |
| Total, salaries and wages | 86,066 | 545,224 | 33,930 | 338,504 | 11,740 | 28,676 | 59,255 |

| Item | Charles and St. Marys Counties | Somerset County | Talbot County | Wicomico County | Worcester County | Total |
|---|---|---|---|---|---|---|
| Establishments | 7 | 137 | 19 | 6 | 7 | 323 |
| Persons engaged: | | | | | | |
| Proprietors | 9 | 261 | 31 | 5 | 9 | 509 |
| Salaried employees | 1 | 41 | 6 | 3 | | 216 |
| Wage earners— | | | | | | |
| Average for season | 142 | 1,749 | 777 | 179 | 47 | 6,121 |
| Average for year | 47 | 868 | 389 | 68 | 30 | 2,891 |
| Paid to salaried employees | $600 | $42,643 | $4,265 | $1,480 | | $306,234 |
| Paid to wage earners | 21,865 | 418,228 | 126,277 | 19,421 | $18,050 | 1,449,990 |
| Total, salaries and wages | 22,465 | 460,871 | 130,542 | 20,901 | 18,050 | 1,756,224 |

*Industries related to the fisheries of Maryland, 1930*—Continued

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Alewives: | | |
| Corned ... pounds | 116,800 | $3,990 |
| Pickled ... do | 404,826 | 19,716 |
| Salted, tight-pack ... do | 2,157,400 | 53,245 |
| Canned ... standard cases | 38,493 | 117,581 |
| Roe, canned ... do | 14,975 | 82,581 |
| Crab meat, packaged (fresh-cooked) ... pounds | 3,351,023 | 939,945 |
| Oysters: | | |
| Fresh-shucked ... gallons | 1,835,283 | 2,958,141 |
| Shell products— | | |
| Poultry feed ... tons | 40,625 | 310,263 |
| Lime ... do | 20,080 | 50,944 |
| Miscellaneous [1] | (2) | 619,185 |
| Total | | 5,155,591 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 52]

| | | |
|---|---|---|
| Alewives, salted ... pounds | 40,000 | $1,800 |
| Eels, salted ... do | 63,400 | 6,340 |
| Total | 103,400 | 8,140 |

[1] Includes smoked alewives, butterfish, carp, cisco, eels, herring, lake trout, salmon, shad, and sturgeon; corned shad; canned terrapin meat and oysters; dry scrap and oil from alewife cuttings and waste; dry scrap from blue crab shells; and marine-shell products.

[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products 49 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## VIRGINIA

*Fisheries of Virginia, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | Lines, trot, with baits or snoods | Pound nets | Fyke nets | Dip nets | Otter trawls |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Stake | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | 1,036 | | | | | | 6 | | | 46 |
| On boats and shore— | | | | | | | | | | |
| Regular | | 398 | 2 | 519 | 264 | 1,335 | 1,242 | 82 | 467 | |
| Casual | | 221 | | 390 | 260 | 71 | 1,101 | 81 | 245 | |
| Total | 1,036 | 619 | 2 | 909 | 524 | 1,406 | 2,349 | 163 | 712 | 46 |
| Vessels: | | | | | | | | | | |
| Steam— | | | | | | | | | | |
| 61 to 70 tons | 2 | | | | | | | | | |
| 71 to 80 tons | 1 | | | | | | | | | |
| 81 to 90 tons | 5 | | | | | | | | | |
| 91 to 100 tons | 3 | | | | | | | | | |
| 101 to 110 tons | 3 | | | | | | | | | |
| 111 to 120 tons | 2 | | | | | | | | | |
| 131 to 140 tons | 2 | | | | | | | | | |
| 141 to 150 tons | 1 | | | | | | | | | |
| 151 to 160 tons | 2 | | | | | | | | | |
| 161 to 170 tons | 2 | | | | | | | | | |

*Fisheries of Virginia, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | Lines, trot, with baits or snoods | Pound nets | Fyke nets | Dip nets | Otter trawls |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Stake | | | | | |
| Vessels—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Steam—Continued. | | | | | | | | | | |
| 171 to 180 tons | 1 | | | | | | | | | |
| 191 to 200 tons | 1 | | | | | | | | | |
| Total | 25 | | | | | | | | | |
| Net tonnage | 2,902 | | | | | | | | | |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | | | | | | | 1 | | | 2 |
| 11 to 20 tons | | | | | | | | | | 9 |
| 21 to 30 tons | | | | | | | | | | 1 |
| 61 to 70 tons | 1 | | | | | | | | | |
| 71 to 80 tons | 3 | | | | | | | | | |
| 131 to 140 tons | 1 | | | | | | | | | |
| 181 to 190 tons | 1 | | | | | | | | | |
| Total | 6 | | | | | | 1 | | | 12 |
| Net tonnage | 609 | | | | | | 7 | | | 173 |
| Total vessels | 31 | | | | | | 1 | | | 12 |
| Total net tonnage | 3,511 | | | | | | 7 | | | 173 |
| Boats. | | | | | | | | | | |
| Motor | | 159 | 1 | 235 | 172 | 1,094 | 731 | 106 | 227 | |
| Other | | 162 | 1 | 424 | 302 | 283 | 377 | 62 | 470 | |
| Accessory boats | 62 | | | | | | | | | |
| Apparatus: | | | | | | | | | | |
| Number | 31 | 187 | 1 | 652 | 16,453 | 1,386 | 2,262 | 1,084 | 712 | 12 |
| Length, yards | 8,720 | 59,430 | | | | | | | | |
| Square yards | | | 9,600 | 663,042 | 607,190 | | | | | 358 |
| Yards at mouth | | | | | | 662,440 | | | | |
| Hooks, baits, or snoods | | | | | | | | | | |

| Item | Pots, eel | Scrapes | Dredges | | | Tongs | Rakes | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Crab | Oyster | Scallop | | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 148 | 205 | | 11 | | | | 1,452 |
| On boats and shore— | | | | | | | | | | |
| Regular | 8 | 326 | 18 | 164 | 443 | 3,092 | 948 | 477 | 450 | 5,718 |
| Casual | | 12 | | 12 | 36 | 1,707 | | | | 3,694 |
| Total | 8 | 338 | 166 | 381 | 479 | 4,810 | 948 | 477 | 450 | 10,864 |
| Vessels: | | | | | | | | | | |
| Steam— | | | | | | | | | | |
| 61 to 70 tons | | | | | | | | | | 2 |
| 71 to 80 tons | | | | | | | | | | 1 |
| 81 to 90 tons | | | | | | | | | | 5 |
| 91 to 100 tons | | | | | | | | | | 3 |
| 101 to 110 tons | | | | | | | | | | 3 |
| 111 to 120 tons | | | | | | | | | | 2 |
| 131 to 140 tons | | | | | | | | | | 2 |
| 141 to 150 tons | | | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | | | 2 |
| 161 to 170 tons | | | | | | | | | | 2 |
| 171 to 180 tons | | | | | | | | | | 1 |
| 191 to 200 tons | | | | | | | | | | 1 |
| Total | | | | | | | | | | 25 |
| Net tonnage | | | | | | | | | | 2,902 |

*Fisheries of Virginia, 1930*—Continued

OPERATING UNITS: By gear—Continued

| Item | Pots, eel | Scrapes | Dredges | | | Tongs | Rakes | Picks | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Crab | Oyster | Scallop | | | | | |
| Vessels—Continued. | | | | | | | | | | |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | | | 38 | 6 | | 4 | | | | 51 |
| 11 to 20 tons | | | 6 | 9 | | | | | | 24 |
| 21 to 30 tons | | | 1 | 1 | | | | | | 3 |
| 41 to 50 tons | | | | 1 | | | | | | 1 |
| 61 to 70 tons | | | | | | | | | | 1 |
| 71 to 80 tons | | | | | | | | | | 3 |
| 131 to 140 tons | | | | | | | | | | 1 |
| 181 to 190 tons | | | | | | | | | | 1 |
| Total | | | 45 | 17 | | 4 | | | | 85 |
| Net tonnage | | | 389 | 233 | | 29 | | | | 1,440 |
| Sail— | | | | | | | | | | |
| 5 to 10 tons | | | | 24 | | | | | | 24 |
| 11 to 20 tons | | | | 3 | | | | | | 3 |
| Total | | | | 27 | | | | | | 27 |
| Net tonnage | | | | 219 | | | | | | 219 |
| Total vessels | | | 45 | 44 | | 4 | | | | 137 |
| Total net tonnage | | | 389 | 452 | | 29 | | | | 4,561 |
| Boats: | | | | | | | | | | |
| Motor | 8 | | 6 | 56 | 348 | 2,928 | 73 | | 12 | 4,530 |
| Other | | 256 | | 28 | 193 | 748 | 858 | 421 | 438 | 3,168 |
| Accessory boats | | | | | | | | | | 62 |
| Apparatus: | | | | | | | | | | |
| Number | 640 | 618 | 102 | 256 | 924 | 4,820 | 948 | 477 | | 31,627 |
| Yards at mouth | | 618 | 182 | 293 | 617 | | | | | |

CATCH: By gear

| Species | Purse seines, menhaden | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 33,400 | $668 | | | 18,400 | $359 |
| Bluefish | | | 19,600 | 1,896 | | | 4,000 | 360 |
| Butterfish | | | 5,300 | 265 | | | | |
| Carp | | | 126,300 | 5,947 | | | | |
| Catfish and bullheads | | | 139,100 | 5,191 | | | | |
| Croaker | | | 931,000 | 23,781 | 18,000 | $540 | 316,400 | 8,390 |
| Drum, red or redfish | | | 10,275 | 410 | | | 1,200 | 36 |
| Flounders | | | 33,150 | 1,618 | | | | |
| Gizzard shad | | | 61,700 | 1,406 | | | 6,000 | 200 |
| Hickory shad | | | 1,200 | 48 | | | 13,100 | 524 |
| Menhaden | 114,953,600 | $762,190 | | | | | | |
| Mullet | | | | | | | 90,900 | 3,825 |
| Pigfish | | | 44,000 | 2,208 | | | 13,000 | 650 |
| Pike or pickerel | | | 80 | 20 | | | | |
| Pompano | | | 2,000 | 400 | | | | |
| Shad | | | 14,100 | 2,115 | | | 758,498 | 115,582 |
| Spanish mackerel | | | 16,300 | 2,445 | | | 6,000 | 850 |
| Spot | | | 1,749,000 | 87,623 | | | 95,800 | 4,523 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 641,300 | 40,734 | | | 30,600 | 1,801 |
| Spotted | | | 194,800 | 23,385 | | | | |
| Striped bass | | | 65,860 | 9,919 | | | 45,300 | 7,195 |
| White perch | | | 53,000 | 2,841 | | | | |
| Whiting | | | 3,600 | 148 | | | | |
| Yellow perch | | | 5,460 | 372 | | | | |
| Total | 114,953,600 | 762,190 | 4,150,525 | 213,440 | 18,000 | 540 | 1,399,198 | 144,295 |

*Fisheries of Virginia, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets, stake | | Lines, trot with baits or snoods | | Pound nets | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 2,000 | $38 | | | 15,220,718 | $178,205 |
| Bluefish | | | | | 206,166 | 13,898 |
| Bonito | | | | | 43,615 | 2,181 |
| Butterfish | | | | | 3,668,698 | 163,360 |
| Carp | | | | | 15,850 | 780 |
| Catfish and bullheads | | | | | 32,300 | 1,583 |
| Cod | | | | | 49,743 | 1,193 |
| Croaker | 5,000 | 150 | | | 17,492,421 | 390,002 |
| Drum: | | | | | | |
| Black | | | | | 24,370 | 517 |
| Red or redfish | | | | | 24,725 | 991 |
| Eels | | | | | 28,800 | 2,624 |
| Flounders | 8,500 | 425 | | | 258,450 | 11,741 |
| Gizzard shad | 600 | 20 | | | 12,150 | 356 |
| Harvestfish or "starfish" | | | | | 400 | 20 |
| Hickory shad | 1,000 | 20 | | | 67,800 | 2,196 |
| King whiting or "kingfish" | | | | | 2,400 | 120 |
| Mackerel | | | | | 47,874 | 4,747 |
| Menhaden | | | | | 888,000 | 5,020 |
| Mullet | 2,000 | 80 | | | 100 | 5 |
| Pigfish | 100 | 6 | | | 11,600 | 580 |
| Scup or porgy | | | | | 91,997 | 3,680 |
| Sea bass | | | | | 20,207 | 1,390 |
| Shad | 710,967 | 111,109 | | | 4,639,844 | 751,259 |
| Skates | | | | | 1,800 | 27 |
| Spanish mackerel | | | | | 27,850 | 3,185 |
| Spot | 2,500 | 163 | | | 589,235 | 28,671 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 25,500 | 1,742 | | | 14,660,862 | 528,790 |
| Spotted | | | | | 3,200 | 384 |
| Striped bass | 63,000 | 10,310 | | | 192,550 | 31,001 |
| Sturgeon | | | | | 2,000 | 600 |
| Tautog | | | | | 800 | 32 |
| White perch | | | | | 58,100 | 3,046 |
| Whiting | | | | | 17,255 | 707 |
| Crabs, hard | | | 20,113,470 | $373,069 | | |
| Squid | | | | | 125,345 | 3,847 |
| Total | 821,167 | 124,063 | 20,113,470 | 373,069 | 58,526,725 | 2,136,738 |

| Species | Fyke nets | | Dip nets | | Otter trawls | | Pots, eel | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 112,500 | $2,263 | | | 40 | $4 | | |
| Bluefish | 200 | 24 | | | 507 | 25 | | |
| Butterfish | 500 | 25 | | | | | | |
| Carp | 100,600 | 5,030 | | | | | | |
| Catfish and bullheads | 236,387 | 8,697 | | | 360 | 7 | | |
| Cod | | | | | 962,780 | 34,483 | | |
| Croaker | 182,600 | 5,417 | | | | | 40,000 | $3,488 |
| Eels | 5,965 | 514 | | | 249,464 | 11,745 | | |
| Flounders | 10,000 | 485 | | | | | | |
| Gizzard shad | 55,300 | 1,252 | | | 1,422 | 42 | | |
| Hake | | | | | | | | |
| Hickory shad | 800 | 40 | | | 589 | 24 | | |
| King whiting or "kingfish" | | | | | 311,517 | 16,781 | | |
| Scup or porgy | | | | | 171,366 | 13,089 | | |
| Sea bass | | | | | | | | |
| Shad | 59,600 | 9,060 | | | 55,000 | 3,820 | | |
| Spot | 1,400 | 74 | | | 126,427 | 5,491 | | |
| Squeteagues or "sea trout," gray | 28,200 | 2,150 | | | | | | |
| Striped bass | 58,465 | 8,651 | | | 2,590 | 780 | | |
| Sturgeon | | | | | 595 | 24 | | |
| White perch | 84,550 | 3,850 | | | 52 | 2 | | |
| Whiting | 800 | 40 | | | | | | |
| Yellow perch | 41,200 | 3,228 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | 308,400 | $5,397 | | | | |
| Soft | | | 897,040 | 75,967 | | | | |
| Squid | | | | | 38 | 2 | | |
| Total | 979,067 | 50,800 | 1,205,440 | 81,364 | 1,882,747 | 86,319 | 40,000 | 3,488 |

*Fisheries of Virginia, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Scrapes | | Dredges | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Crab | | Oyster | | Scallops | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: | | | | | | | | |
| Hard | 1,024,000 | $15,360 | 7,494,000 | $149,230 | | | | |
| Soft | 1,983,960 | 119,038 | | | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 81,634 | $11,900 | | |
| Market, public, fall | | | | | 296,557 | 43,130 | | |
| Market, private, spring | | | | | 940,314 | 111,876 | | |
| Market, private, fall | | | | | 3,287,751 | 393,033 | | |
| Scallops, bay | | | | | | | 1,824,948 | $147,564 |
| Total | 3,007,960 | 134,398 | 7,494,000 | 149,230 | 4,606,256 | 559,939 | 1,824,948 | 147,564 |

| Species | Tongs | | Rakes | | Picks | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, hard, public | 1,018,424 | $321,592 | 132,400 | $44,075 | 18,712 | $7,204 | 43,200 | $18,900 |
| Oysters: | | | | | | | | |
| Market, public, spring | 1,492,681 | 173,090 | 6,860 | 500 | | | | |
| Market, public, fall | 4,526,393 | 522,843 | 20,580 | 1,500 | | | | |
| Market, private, spring | 1,896,680 | 223,588 | 133,468 | 10,103 | | | 10,290 | 750 |
| Market, private, fall | 6,356,188 | 747,073 | 537,611 | 40,309 | | | 30,870 | 2,250 |
| Seed, public, spring | 2,509,715 | 125,483 | | | | | | |
| Seed, public, fall | 5,537,205 | 280,605 | | | | | | |
| Total | 23,337,286 | 2,394,274 | 830,919 | 96,487 | 18,712 | 7,204 | 84,360 | 21,900 |

OPERATING UNITS: BY COUNTIES

| Item | Accomac | Alexandria | Caroline | Charles City | Chesterfield | Dinwiddie | Elizabeth City | Essex | Fairfax |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 41 | | | | | | 96 | | |
| On boats and shore— | | | | | | | | | |
| Regular | 1,255 | | | 231 | | | 344 | | |
| Casual | 282 | 18 | 10 | | 14 | 10 | | 144 | 36 |
| Total | 1,578 | 18 | 10 | 231 | 14 | 10 | 440 | 144 | 36 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 1 | | | | | | 15 | | |
| 11 to 20 tons | | | | | | | 9 | | |
| 21 to 30 tons | | | | | | | 1 | | |
| Total | 1 | | | | | | 25 | | |
| Net tonnage | 6 | | | | | | 279 | | |
| Sail, 5 to 10 tons | 9 | | | | | | | | |
| Net tonnage | 62 | | | | | | | | |
| Total vessels | 10 | | | | | | 25 | | |
| Total net tonnage | 68 | | | | | | 279 | | |
| Boats: | | | | | | | | | |
| Motor | 768 | 10 | | 2 | 5 | 2 | 114 | 45 | 26 |
| Other | 782 | | 5 | 165 | 4 | 7 | 26 | 61 | 14 |
| Apparatus: | | | | | | | | | |
| Haul seines | 8 | | | 9 | 3 | | | 7 | 5 |
| Length, yards | 3,280 | | | 2,700 | 600 | | | 1,960 | 840 |
| Gill nets— | | | | | | | | | |
| Anchor | 1 | | | | | | | | |
| Square yards | 9,600 | | | | | | | | |
| Drift | 4 | 8 | 5 | 231 | 7 | | 11 | 10 | 6 |
| Square yards | 7,600 | 14,400 | 6,000 | 254,100 | 4,200 | | 9,900 | 7,000 | 10,800 |
| Stake | 145 | | | 40 | | 330 | | | |
| Square yards | 2,400 | | | 1,320 | | 6,600 | | | |
| Lines, trot, with baits or snoods | 267 | | | | | | 14 | | |
| Baits or snoods | 146,800 | | | | | | 10,500 | | |

*Fisheries of Virginia, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Accomac | Alexandria | Caroline | Charles City | Chesterfield | Dinwiddie | Elizabeth City | Essex | Fairfax |
|---|---|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Pound nets | 326 | | | | | | 365 | 6 | |
| Fyke nets | 5 | 11 | 2 | 21 | | | | 4 | 340 |
| Dip nets | 200 | | | | | | | | |
| Otter trawls | | | | | | | 5 | | |
| Yards at mouth | | | | | | | 150 | | |
| Pots, eel | 640 | | | | | | | | |
| Scrapes | 618 | | | | | | | | |
| Yards at mouth | 618 | | | | | | | | |
| Dredges— | | | | | | | | | |
| Crab | | | | | | | 32 | | |
| Yards at mouth | | | | | | | 56 | | |
| Oyster | 122 | | | | | | 8 | 6 | |
| Yards at mouth | 130 | | | | | | 13 | 6 | |
| Scallop | 697 | | | | | | | | |
| Yards at mouth | 465 | | | | | | | | |
| Tongs | 819 | | | | | | 60 | 106 | |
| Rakes | 474 | | | | | | | | |
| Picks | 168 | | | | | | | | |

| Item | Gloucester | Henrico | Isle of Wight | James City | King and Queen | King George | King William | Lancaster | Mathews |
|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 3 | | | | | | | 322 | 18 |
| On boats and shore— | | | | | | | | | |
| Regular | 193 | | 402 | 101 | | 29 | | 295 | 308 |
| Casual | 334 | 200 | | | 57 | 59 | 83 | 522 | 378 |
| Total | 530 | 200 | 402 | 101 | 57 | 88 | 83 | 1,139 | 704 |
| Vessels: | | | | | | | | | |
| Steam— | | | | | | | | | |
| 61 to 70 tons | | | | | | | | 2 | |
| 81 to 90 tons | | | | | | | | 1 | |
| 91 to 100 tons | | | | | | | | 1 | |
| 141 to 150 tons | | | | | | | | 1 | |
| Total | | | | | | | | 5 | |
| Net tonnage | | | | | | | | 463 | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 1 | | | | | | | 2 | 2 |
| 11 to 20 tons | | | | | | | | 2 | 2 |
| 61 to 70 tons | | | | | | | | 1 | |
| 71 to 80 tons | | | | | | | | 3 | |
| Total | 1 | | | | | | | 8 | 4 |
| Net tonnage | 8 | | | | | | | 329 | 36 |
| Total vessels | 1 | | | | | | | 13 | 4 |
| Total net tonnage | 8 | | | | | | | 792 | 36 |
| Boats: | | | | | | | | | |
| Motor | 338 | 20 | 279 | 39 | | 40 | 10 | 439 | 363 |
| Other | 126 | 150 | 91 | 40 | 49 | 38 | 68 | 33 | 32 |
| Accessory boats | | | | | | | | 18 | |
| Apparatus: | | | | | | | | | |
| Purse seines, menhaden | | | | | | | | 9 | |
| Length, yards | | | | | | | | 2,430 | |
| Haul seines | | 20 | 3 | 2 | | 2 | 2 | 3 | |
| Length, yards | | 4,000 | 600 | 600 | | 1,300 | 400 | 600 | |
| Gill nets— | | | | | | | | | |
| Drift | 18 | | 12 | 19 | 42 | | 54 | 3 | 10 |
| Square yards | 13,200 | | 4,800 | 19,200 | 37,800 | | 54,000 | 1,800 | 11,000 |
| Stake | | 1,700 | 8,400 | 2,020 | | 237 | | | |
| Square yards | | 51,000 | 278,640 | 78,600 | | 54,550 | | | |
| Lines, trot, with baits or snoods | 78 | | 77 | | | 17 | | 86 | 130 |
| Baits or snoods | 44,800 | | 38,500 | | | 4,250 | | 34,400 | 104,000 |
| Pound nets | 95 | | 20 | | | 25 | | 231 | 463 |
| Fyke nets | 12 | | 136 | 54 | 4 | 46 | 8 | 8 | |
| Dip nets | | | | | | | | | 147 |
| Dredges— | | | | | | | | | |
| Oyster | | | | | | | | 8 | 8 |
| Yards at mouth | | | | | | | | 11 | 11 |
| Tongs | 450 | | 336 | 15 | | 29 | 20 | 510 | 194 |

*Fisheries of Virginia, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Middlesex | Nansemond | New Kent | Norfolk | Northampton | Northumberland | Prince George | Princess Anne |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 5 | | | 26 | 3 | 767 | | |
| On boats and shore— | | | | | | | | |
| Regular | 200 | 50 | 68 | 95 | 589 | 505 | | 66 |
| Casual | 543 | 121 | | 111 | 30 | 418 | 37 | |
| Total | 748 | 171 | 68 | 232 | 622 | 1,690 | 37 | 66 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 71 to 80 tons | | | | | | 1 | | |
| 81 to 90 tons | | | | | | 4 | | |
| 91 to 100 tons | | | | | | 2 | | |
| 101 to 110 tons | | | | | | 3 | | |
| 111 to 120 tons | | | | | | 2 | | |
| 131 to 140 tons | | | | | | 2 | | |
| 151 to 160 tons | | | | | | 2 | | |
| 161 to 170 tons | | | | | | 2 | | |
| 171 to 180 tons | | | | | | 1 | | |
| 191 to 200 tons | | | | | | 1 | | |
| Total | | | | | | 20 | | |
| Net tonnage | | | | | | 2,439 | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 1 | | | | | | | |
| 11 to 20 tons | | | | 3 | 1 | | | |
| 21 to 30 tons | | | | 1 | | | | |
| 41 to 50 tons | | | | 1 | | | | |
| 131 to 140 tons | | | | | | 1 | | |
| 181 to 190 tons | | | | | | 1 | | |
| Total | 1 | | | 5 | 1 | 2 | | |
| Net tonnage | 8 | | | 114 | 11 | 317 | | |
| Sail, 5 to 10 tons | | | | | | 8 | | |
| Net tonnage | | | | | | 58 | | |
| Total vessels | 1 | | | 5 | 1 | 30 | | |
| Total net tonnage | 8 | | | 114 | 11 | 2,814 | | |
| Boats: | | | | | | | | |
| Motor | 474 | 76 | 16 | 20 | 331 | 377 | 16 | 31 |
| Other | 6 | 28 | 39 | 169 | 513 | 400 | 13 | 12 |
| Accessory boats | | | | | | 44 | | |
| Apparatus: | | | | | | | | |
| Purse seines, menhaden | | | | | | 22 | | |
| Length, yards | | | | | | 6,290 | | |
| Haul seines | 9 | | 3 | 7 | 15 | | 6 | 2 |
| Length, yards | 2,700 | | 800 | 2,750 | 5,020 | | 1,800 | 500 |
| Gill nets— | | | | | | | | |
| Drift | 2 | 1 | 60 | | 45 | | 32 | |
| Square yards | 1,200 | 300 | 60,000 | | 15,960 | | 25,600 | |
| Stake | | 1,180 | | 90 | | | | |
| Square yards | | 57,200 | | 7,200 | | | | |
| Lines, trot, with baits or snoods | 97 | 21 | | 89 | 106 | 264 | | |
| Baits or snoods | 24,250 | 4,200 | | 35,600 | 54,600 | 83,200 | | |
| Pound nets | 21 | | | 13 | 131 | 368 | | 6 |
| Fyke nets | | 21 | 14 | | 1 | | 35 | |
| Dip nets | | | | | | 275 | | |
| Otter trawls | | | | 1 | | | | |
| Yards at mouth | | | | 30 | | | | |
| Dredges— | | | | | | | | |
| Crab | | | | | 2 | | | |
| Yards at mouth | | | | | 3 | | | |
| Oyster | 2 | | | 8 | | 30 | | |
| Yards at mouth | 3 | | | 12 | | 34 | | |
| Scallop | | | | | 227 | | | |
| Yards at mouth | | | | | 152 | | | |
| Tongs | 628 | 130 | | 127 | 229 | 251 | | 46 |
| Rakes | | | | | 304 | | | |
| Picks | | | | | 309 | | | |

*Fisheries of Virginia, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Prince William | Richmond | Spotsylvania | Stafford | Surry | Warwick | Westmoreland | York |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | | | | | 51 | 120 |
| On boats and shore— | | | | | | | | |
| Regular | 42 | | | | 39 | 302 | 154 | 450 |
| Casual | 38 | 108 | 13 | 36 | | 4 | 70 | 18 |
| Total | 80 | 108 | 13 | 36 | 39 | 306 | 275 | 588 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | | | | | | 2 | 27 |
| 11 to 20 tons | | | | | | | | 7 |
| 21 to 30 tons | | | | | | | | 1 |
| Total | | | | | | | 2 | 35 |
| Net tonnage | | | | | | | 15 | 317 |
| Sail— | | | | | | | | |
| 5 to 10 tons | | | | | | | 7 | |
| 11 to 20 tons | | | | | | | 3 | |
| Total | | | | | | | 10 | |
| Net tonnage | | | | | | | 99 | |
| Total vessels | | | | | | | 22 | 35 |
| Total net tonnage | | | | | | | 114 | 317 |
| Boats: | | | | | | | | |
| Motor | 31 | 35 | 13 | 15 | 26 | 166 | 95 | 308 |
| Other | 10 | 35 | | 4 | 10 | 13 | 46 | 179 |
| Apparatus: | | | | | | | | |
| Haul seines | 14 | | | 4 | 9 | | 7 | 47 |
| Length, yards | 1,680 | | | 600 | 2,700 | | 1,200 | 22,800 |
| Gill nets— | | | | | | | | |
| Drift | 18 | 16 | | 5 | 8 | | 4 | 21 |
| Square yards | 30,062 | 26,720 | | 9,000 | 8,400 | | 4,800 | 25,200 |
| Stake | 1 | | | 20 | 1,384 | 306 | | |
| Square yards | 1,000 | | | 9,320 | 44,960 | 14,400 | | |
| Lines, trot, with baits or snoods | | 1 | 6 | 2 | | 8 | 64 | 59 |
| Baits or snoods | | 400 | 1,480 | 460 | | 4,000 | 25,600 | 45,400 |
| Pound nets | | 30 | | 6 | | 56 | 64 | 36 |
| Fyke nets | 207 | 6 | 40 | 44 | 18 | 17 | 19 | 11 |
| Otter trawls | | | | | | | | 6 |
| Yards at mouth | | | | | | | | 178 |
| Dredges— | | | | | | | | |
| Crab | | | | | | | | 68 |
| Yards at mouth | | | | | | | | 123 |
| Oyster | | 2 | | | | | 62 | |
| Yards at mouth | | 2 | | | | | 71 | |
| Tongs | | 62 | | | | 273 | 139 | 396 |
| Rakes | | | | | | | | 170 |

CATCH: BY COUNTIES

| Species | Accomac | | Alexandria | | Caroline | | Charles City | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 898,900 | $13,484 | | | 1,500 | $30 | 16,800 | $336 |
| Bluefish | 57,000 | 4,231 | | | | | | |
| Bonito | 6,800 | 340 | | | | | | |
| Butterfish | 1,537,975 | 61,864 | | | | | | |
| Carp | | | | | | | 43,000 | 2,150 |
| Catfish and bullheads | | | 1,800 | $72 | 300 | 15 | 28,800 | 864 |
| Cod | 20,800 | 624 | | | | | | |
| Croaker | 2,159,130 | 64,794 | | | | | | |
| Drum: | | | | | | | | |
| Black | 20,370 | 407 | | | | | | |
| Red or redfish | 10,800 | 431 | | | | | | |
| Eels | 56,900 | 4,840 | | | 200 | 10 | | |
| Flounders | 40,100 | 1,891 | | | | | | |

*Fisheries of Virginia, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Accomac | | Alexander | | Caroline | | Charles City | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Gizzard shad | | | | | | | 24,200 | $484 |
| Harvestfish or "starfish" | 400 | $20 | | | | | | |
| Mackerel | 3,200 | 320 | | | | | | |
| Mullet | 100 | 5 | | | | | | |
| Pigfish | 1,400 | 79 | | | | | | |
| Scup or porgy | 27,100 | 1,084 | | | | | | |
| Sea bass | 11,300 | 678 | | | | | | |
| Shad | 304,600 | 45,700 | 5,940 | $990 | 1,200 | $240 | 539,700 | 80,955 |
| Skates | 1,800 | 2 | | | | | | |
| Spanish mackerel | 1,600 | 160 | | | | | | |
| Spot | 45,700 | 2,363 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 5,543,661 | 169,688 | | | | | | |
| Spotted | 300 | 45 | | | | | | |
| Striped bass | 8,650 | 1,675 | | | | | 34,900 | 5,236 |
| Sturgeon | 1,000 | 300 | | | | | | |
| Tautog | 800 | 32 | | | | | | |
| White perch | 5,000 | 338 | | | 500 | 25 | 6,150 | 185 |
| Whiting | 15,500 | 620 | | | | | | |
| Yellow perch | | | 2,400 | 192 | | | | |
| Crabs: | | | | | | | | |
| Hard | 5,881,670 | 132,896 | | | | | | |
| Soft | 2,511,000 | 158,565 | | | | | | |
| Squid | 8,800 | 352 | | | | | | |
| Clams, hard, public | 368,976 | 157,044 | | | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 144,623 | 19,582 | | | | | | |
| Market, public, fall | 386,547 | 51,848 | | | | | | |
| Market, private, spring | 892,246 | 100,920 | | | | | | |
| Market, private, fall | 2,676,738 | 302,760 | | | | | | |
| Scallops, bay | 1,442,988 | 121,900 | | | | | | |
| Total | 25,094,474 | 1,421,907 | 10,140 | 1,254 | 3,700 | 320 | 693,550 | 90,210 |

| Species | Chesterfield | | Dinwiddie | | Elizabeth City | | Essex | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 3,000 | $60 | | | 730,000 | $7,300 | 14,400 | $288 |
| Bluefish | | | | | 17,500 | 1,750 | | |
| Bonito | | | | | 1,000 | 50 | | |
| Butterfish | | | | | 565,000 | 22,600 | | |
| Carp | 4,700 | 165 | | | | | 13,500 | 675 |
| Catfish and bullheads | 3,200 | 96 | | | | | 20,100 | 1,005 |
| Cod | | | | | 6,300 | 126 | | |
| Croaker | | | | | 7,798,000 | 162,040 | 20,500 | 615 |
| Flounders | | | | | 68,650 | 3,793 | | |
| Gizzard shad | 2,300 | 46 | | | 200 | 10 | | |
| Hickory shad | | | | | 9,000 | 360 | | |
| Scup or porgy | | | | | 128,000 | 8,240 | | |
| Sea bass | | | | | 34,000 | 3,300 | | |
| Shad | 11,400 | 1,710 | 4,400 | $660 | 730,000 | 109,500 | 1,500 | 225 |
| Spanish mackerel | | | | | 18,250 | 1,825 | | |
| Spot | | | | | 151,000 | 6,160 | 1,400 | 70 |
| Squeteagues or "sea trout," gray | | | | | 793,200 | 24,774 | | |
| Striped bass | 1,400 | 210 | 800 | 120 | 13,000 | 1,560 | | |
| Sturgeon | | | | | 1,000 | 300 | | |
| White perch | 1,200 | 60 | | | 3,650 | 108 | 7,200 | 576 |
| Crabs, hard | | | | | 2,576,000 | 48,160 | | |
| Clams, hard, public | | | | | 113,600 | 35,500 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 17,664 | 1,545 | 36,907 | 5,380 |
| Market, public, fall | | | | | 32,928 | 2,880 | 115,687 | 16,864 |
| Market, private, spring | | | | | 114,130 | 13,308 | 31,597 | 4,606 |
| Market, private, fall | | | | | 255,528 | 24,751 | 178,277 | 25,988 |
| Seed, public, spring | | | | | 65,001 | 3,250 | | |
| Seed, public, fall | | | | | 130,003 | 6,500 | | |
| Total | 27,200 | 2,347 | 5,200 | 780 | 14,372,604 | 489,690 | 441,068 | 56,292 |

*Fisheries of Virginia, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Fairfax | | Gloucester | | Henrico | | Isle of Wight | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 46,600 | $498 | 8,000 | $160 | 70,000 | $1,400 |
| Bluefish | | | 1,800 | 180 | | | | |
| Butterfish | | | 8,900 | 445 | | | | |
| Carp | | | | | 10,000 | 500 | 43,500 | 2,175 |
| Catfish and bullheads | 93,687 | $3,744 | | | 8,500 | 255 | 43,000 | 1,290 |
| Croaker | | | 2,993,200 | 59,876 | | | 164,000 | 4,920 |
| Drum: | | | | | | | | |
| Black | | | 600 | 18 | | | | |
| Red or redfish | | | 200 | 10 | | | | |
| Eels | | | | | | | 1,500 | 120 |
| Flounders | | | 9,000 | 450 | | | 18,500 | 925 |
| Gizzard shad | | | 1,800 | 90 | 9,000 | 180 | 25,000 | 500 |
| Hickory shad | | | 5,300 | 164 | | | 1,000 | 20 |
| King whiting or "kingfish" | | | 2,400 | 120 | | | | |
| Mullet | | | | | | | 8,500 | 340 |
| Shad | 3,900 | 630 | 132,600 | 19,890 | 38,000 | 5,700 | 349,400 | 52,410 |
| Spot | | | 75,600 | 3,780 | | | | |
| Squeteagues or "sea trout," gray | | | 1,666,400 | 50,040 | | | 45,000 | 3,150 |
| Striped bass | | | 400 | 60 | 8,400 | 1,260 | 44,200 | 6,630 |
| White perch | 12,400 | 744 | 2,200 | 132 | | | 33,000 | 1,030 |
| Yellow perch | 18,000 | 1,440 | 500 | 40 | 2,000 | 100 | | |
| Crabs, hard | | | 1,420,000 | 22,400 | | | 192,500 | 3,012 |
| Clams, hard, public | | | 40,960 | 12,800 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 116,599 | 13,089 | | | 252,530 | 22,086 |
| Market, public, fall | | | 235,806 | 26,470 | | | 757,605 | 55,219 |
| Market, private, spring | | | 54,880 | 6,355 | | | 222,950 | 19,500 |
| Market, private, fall | | | 164,640 | 19,065 | | | 668,850 | 58,500 |
| Seed, public, spring | | | 105,002 | 5,250 | | | 722,514 | 36,125 |
| Seed, public, fall | | | 215,004 | 10,750 | | | 1,806,297 | 90,315 |
| Total | 127,987 | 6,558 | 7,300,391 | 251,972 | 83,900 | 8,155 | 5,469,846 | 359,665 |

| Species | James City | | King and Queen | | King George | | King William | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 25,800 | $516 | 1,200 | $36 | 22,600 | $408 | 2,800 | $56 |
| Carp | 21,500 | 1,075 | | | | | | |
| Catfish and bullheads | 18,500 | 555 | 1,500 | 75 | 13,200 | 528 | 2,200 | 110 |
| Croaker | 8,400 | 252 | 500 | 15 | | | 2,000 | 64 |
| Flounders | | | | | | | 800 | 48 |
| Gizzard shad | 14,800 | 296 | | | | | | |
| Hickory shad | | | 10,800 | 432 | | | 3,000 | 120 |
| Shad | 255,900 | 38,835 | 17,940 | 2,691 | 12,840 | 2,175 | 28,650 | 4,295 |
| Squeteagues or "sea trout," gray | 8,000 | 800 | 600 | 30 | | | 500 | 25 |
| Striped bass | 25,500 | 3,825 | 2,400 | 360 | 18,260 | 3,539 | 2,200 | 210 |
| White perch | 9,600 | 422 | 1,200 | 60 | 8,000 | 480 | 1,800 | 90 |
| Yellow perch | | | 800 | 64 | 2,600 | 208 | 500 | 40 |
| Crabs, hard | | | | | 102,000 | 2,040 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 4,445 | 648 | 4,802 | 420 |
| Market, public, fall | | | | | 13,459 | 1,962 | 15,092 | 1,760 |
| Market, private, spring | | | | | | | 61,740 | 7,200 |
| Market, private, fall | | | | | | | 185,220 | 21,600 |
| Seed, public, spring | 35,001 | 1,750 | | | | | | |
| Seed, public, fall | 65,001 | 3,250 | | | | | | |
| Total | 488,002 | 51,576 | 36,940 | 3,763 | 197,404 | 11,988 | 311,304 | 36,038 |

| Species | Lancaster | | Matthews | | Middlesex | | Nansemond | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 1,496,500 | $14,971 | 1,626,000 | $16,260 | 51,500 | $1,030 | 1,600 | $32 |
| Bluefish | 9,460 | 757 | 21,250 | 1,700 | | | | |
| Butterfish | 480,000 | 33,600 | 2,100 | 105 | | | | |
| Carp | 1,800 | 90 | | | 12,000 | 480 | | |
| Catfish and bullheads | 2,500 | 125 | | | 2,000 | 80 | 400 | 20 |
| Croaker | 301,200 | 9,036 | 1,226,400 | 24,688 | 256,500 | 5,305 | 49,200 | 1,476 |
| Eels | 2,800 | 224 | | | | | | |
| Flounders | 50,400 | 2,040 | 25,800 | 1,032 | 1,200 | 60 | | |
| Gizzard shad | 1,000 | 40 | 950 | 36 | | | 6,600 | 220 |
| Hickory shad | 2,200 | 88 | | | | | | |

*Fisheries of Virginia, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Lancaster | | Matthews | | Middlesex | | Nansemond | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Menhaden | 30,578,600 | $202,804 | | | | | | |
| Pigfish | | | 1,700 | $85 | | | | |
| Pike or pickerel | | | | | 80 | $20 | | |
| Shad | 930,884 | 126,221 | 1,100,030 | 220,060 | 48,200 | 7,230 | 35,800 | $8,950 |
| Spanish mackerel | | | 800 | 80 | | | | |
| Spot | 90,600 | 4,530 | 48,200 | 1,648 | 16,000 | 800 | | |
| Squeteagues or "sea trout," gray | 315,400 | 9,474 | 1,322,700 | 39,761 | 27,700 | 1,385 | | |
| Striped bass | 21,750 | 3,262 | 1,400 | 210 | 20,500 | 3,075 | 400 | 60 |
| White perch | 9,200 | 552 | 700 | 42 | 11,000 | 330 | 200 | 20 |
| Whiting | 1,200 | 60 | | | | | | |
| Yellow perch | 700 | 70 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | 856,400 | 12,846 | 2,175,000 | 32,625 | 730,000 | 14,600 | 105,000 | 2,100 |
| Soft | | | 50,000 | 4,440 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 206,417 | 30,090 | 38,690 | 5,076 | 239,675 | 34,938 | 70,315 | 6,030 |
| Market, public, fall | 564,647 | 82,310 | 195,236 | 25,614 | 719,010 | 104,812 | 210,945 | 15,375 |
| Market, private, spring | 59,682 | 8,700 | 20,580 | 2,400 | 129,201 | 18,834 | 161,896 | 14,160 |
| Market, private, fall | 1,222,315 | 178,180 | 322,420 | 37,600 | 258,389 | 37,666 | 620,144 | 45,200 |
| Seed, public, spring | | | | | 20,000 | 1,000 | 16,500 | 825 |
| Seed, public, fall | | | | | 40,001 | 2,000 | 64,001 | 3,200 |
| Total | 37,205,655 | 720,070 | 8,179,956 | 413,462 | 2,582,956 | 233,645 | 1,343,001 | 97,668 |

| Species | New Kent | | Norfolk | | Northampton | | Northumberland | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 7,200 | $144 | 19,500 | $293 | 57,600 | $897 | 9,762,711 | $114,289 |
| Bluefish | | | 440 | 44 | 92,156 | 4,720 | 10,400 | 832 |
| Bonito | | | | | 35,815 | 1,791 | | |
| Butterfish | | | 10,507 | 525 | 1,016,823 | 40,673 | 21,400 | 1,498 |
| Carp | 12,000 | 600 | | | | | | |
| Catfish and bullheads | 6,000 | 180 | | | | | | |
| Cod | | | 3,360 | 67 | 19,643 | 383 | | |
| Croaker | | | 596,780 | 13,883 | 1,174,291 | 35,311 | 1,292,400 | 35,932 |
| Drum, black | | | | | 2,400 | 72 | | |
| Eels | | | | | 9,865 | 1,163 | 1,800 | 144 |
| Flounders | | | 10,064 | 545 | 57,750 | 2,852 | 38,800 | 1,675 |
| Gizzard shad | 6,500 | 140 | | | | | | |
| Hake | | | 1,422 | 42 | | | | |
| Hickory shad | 800 | 40 | | | | | 51,800 | 1,604 |
| King whiting or "kingfish" | | | 589 | 24 | | | | |
| Mackerel | | | | | 44,674 | 4,427 | | |
| Menhaden | | | | | 48,000 | 340 | 85,215,000 | 564,066 |
| Mullet | | | | | 84,400 | 3,565 | | |
| Pigfish | | | 200 | 10 | 1,400 | 70 | | |
| Scup or porgy | | | 13,517 | 541 | 64,897 | 2,596 | | |
| Sea bass | | | 7,366 | 589 | 8,907 | 712 | | |
| Shad | 61,800 | 10,070 | 32,450 | 5,841 | 13,407 | 2,061 | 1,037,023 | 162,143 |
| Spanish mackerel | | | | | 200 | 20 | | |
| Spot | | | 1,417,000 | 70,850 | 122,135 | 7,416 | 4,100 | 222 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 118,527 | 5,706 | 5,007,351 | 245,970 | 338,900 | 12,572 |
| Spotted | | | 44,500 | 5,340 | | | | |
| Striped bass | 7,500 | 1,125 | | | 6,065 | 923 | 78,600 | 13,848 |
| Sturgeon | | | 90 | 30 | | | | |
| White perch | 2,300 | 115 | 595 | 24 | | | 2,000 | 112 |
| Whiting | | | 3,252 | 130 | 1,755 | 87 | | |
| Yellow perch | 100 | 10 | | | | | | |
| Crabs: | | | | | | | | |
| Hard | | | 1,441,800 | 26,045 | 1,316,100 | 25,572 | 3,472,500 | 52,087 |
| Soft | | | | | | | 320,000 | 32,000 |
| Squid | | | 38 | 2 | 116,545 | 3,495 | | |
| Clams, hard, public | | | | | 105,600 | 40,007 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 2,278 | 232 | 62,928 | 9,173 |
| Market, public, fall | | | | | 6,846 | 698 | 235,346 | 34,252 |
| Market, private, spring | | | 678,008 | 74,068 | 142,098 | 10,362 | 110,446 | 16,100 |
| Market, private, fall | | | 2,134,592 | 233,932 | 511,639 | 37,306 | 475,398 | 69,300 |
| Seed, public, spring | | | | | 55,001 | 2,750 | | |
| Seed, public, fall | | | 125,003 | 10,000 | 110,002 | 5,500 | | |
| Scallops, bay | | | | | 381,960 | 25,664 | | |
| Total | 104,200 | 12,424 | 6,659,600 | 448,531 | 10,617,603 | 507,635 | 102,531,552 | 1,121,849 |

*Fisheries of Virginia, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Prince George | | Princess Anne | | Prince William | | Richmond | | Spotsylvania | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 21,500 | $430 | | | | | 74,000 | $1,480 | | |
| Bluefish | | | 2,400 | $240 | | | | | | |
| Butterfish | | | 12,000 | 600 | | | | | | |
| Carp | 25,500 | 1,275 | | | | | 4,250 | 210 | | |
| Catfish and bullheads | 16,500 | 495 | | | 30,600 | $1,224 | 18,200 | 910 | 14,000 | $560 |
| Croaker | | | 107,000 | 2,140 | | | 19,000 | 760 | | |
| Eels | | | | | | | 1,500 | 105 | | |
| Flounders | | | 1,800 | 90 | | | | | | |
| Gizzard shad | 15,000 | 340 | | | | | | | | |
| Shad | 42,200 | 6,575 | 110,000 | 19,800 | 6,608 | 1,042 | 14,850 | 2,228 | | |
| Spot | | | 151,200 | 7,560 | | | 1,500 | 75 | | |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | | | 17,000 | 850 | | | | | | |
| Spotted | | | 3,200 | 384 | | | | | | |
| Striped bass | 8,350 | 1,252 | | | 8,200 | 1,640 | | | | |
| White perch | 6,700 | 335 | | | 13,600 | 816 | 13,950 | 698 | | |
| Yellow perch | | | | | 5,460 | 432 | | | 8,400 | 588 |
| Crab, hard | | | | | | | 3,500 | 70 | 36,000 | 720 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | | | 32,269 | 4,704 | | |
| Market, public, fall | | | | | | | 96,808 | 14,112 | | |
| Market, private, spring | | | 132,741 | 29,025 | | | 138,030 | 18,109 | | |
| Market, private, fall | | | 265,139 | 57,975 | | | 201,856 | 26,608 | | |
| Total | 135,750 | 10,702 | 802,480 | 118,664 | 64,468 | 5,154 | 619,713 | 70,069 | 58,400 | 1,868 |

| Species | Stafford | | Surry | | Warwick | | Westmoreland | | York | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 20,500 | $410 | 74,000 | $1,110 | 291,307 | $5,200 | 41,500 | $415 |
| Bluefish | | | | | | | | | 17,600 | 1,728 |
| Butterfish | | | | | 500 | 25 | | | 19,800 | 1,740 |
| Carp | | | 40,600 | 1,530 | | | 10,400 | 832 | | |
| Catfish and bullheads | 11,600 | $580 | 43,600 | 1,308 | | | 27,600 | 1,380 | | |
| Croaker | | | 6,200 | 186 | 53,000 | 1,060 | 21,800 | 436 | 1,658,700 | 39,974 |
| Drum: | | | | | | | | | | |
| Black | | | | | | | | | 1,000 | 20 |
| Red or redfish | | | | | | | | | 25,200 | 996 |
| Eels | | | | | | | | | 200 | 20 |
| Flounders | | | | | 10,000 | 500 | | | 226,700 | 10,113 |
| Gizzard shad | 2,000 | 60 | 25,600 | 768 | 400 | 16 | 400 | 8 | | |
| Pigfish | | | | | | | | | 64,000 | 3,200 |
| Pompano | | | | | | | | | 2,000 | 400 |
| Scup or porgy | | | | | | | | | 170,000 | 8,000 |
| Sea bass | | | | | | | | | 130,000 | 9,200 |
| Shad | 2,205 | 378 | 78,200 | 11,730 | 81,000 | 13,230 | 38,382 | 6,660 | 112,000 | 18,300 |
| Spanish mackerel | | | | | | | | | 29,300 | 4,395 |
| Spot | | | | | | | | | 368,500 | 19,400 |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | | | | | 20,800 | 1,248 | 28,050 | 709 | 258,600 | 14,526 |
| Spotted | | | | | | | | | 150,000 | 18,000 |
| Striped bass | 2,700 | 405 | 14,700 | 2,205 | 16,240 | 2,436 | 35,260 | 5,440 | 43,400 | 6,510 |
| Sturgeon | | | | | | | | | 2,500 | 750 |
| White perch | 6,000 | 348 | 12,300 | 615 | 6,300 | 504 | 19,000 | 950 | 500 | 50 |
| Yellow perch | 1,800 | 144 | | | | | 3,400 | 272 | | |
| Crabs, hard | 9,000 | 135 | | | 62,400 | 1,248 | 960,000 | 14,400 | 7,600,000 | 152,100 |
| Clams, hard, public | | | | | | | | | 583,600 | 146,420 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | 64,724 | 5,661 | 30,774 | 4,486 | 255,535 | 22,350 |
| Market, public, fall | | | | | 194,172 | 16,983 | 296,791 | 43,264 | 766,605 | 73,050 |
| Market, private, spring | | | | | | | | | 30,527 | 2,670 |
| Market, private, fall | | | | | | | | | 71,275 | 6,234 |
| Seed, public, spring | | | | | 911,519 | 45,575 | | | 579,177 | 28,958 |
| Seed, public, fall | | | | | 1,823,537 | 91,175 | | | 1,158,356 | 57,917 |
| Total | 35,305 | 2,050 | 241,700 | 18,752 | 3,318,592 | 180,771 | 1,763,164 | 84,037 | 14,366,575 | 647,436 |

*Industries related to the fisheries of Virginia, 1930*

TRANSPORTING

| Item | Accomac County | Elizabeth City County | Gloucester County | Isle of Wight County | King and Queen County | Lancaster County | Mathews County | Middlesex County |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 95 | 18 | 23 | 8 | 11 | 83 | 57 | 40 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 36 | 3 | 6 | 2 | 3 | 21 | 18 | 9 |
| 11 to 20 tons | 10 | 5 | 6 | 2 | 1 | 14 | 11 | 6 |
| 21 to 30 tons | 4 | | | | | 3 | | 2 |
| 31 to 40 tons | 2 | | | | 1 | | | 1 |
| 71 to 80 tons | | | | | | 2 | | |
| Total | 52 | 8 | 12 | 4 | 5 | 40 | 29 | 18 |
| Net tonnage | 577 | 95 | 123 | 42 | 72 | 585 | 287 | 244 |
| Sail— | | | | | | | | |
| 21 to 30 tons | | | | | | | 1 | |
| Net tonnage | | | | | | | 30 | |
| Total vessels | 52 | 8 | 12 | 4 | 5 | 40 | 30 | 18 |
| Total net tonnage | 577 | 95 | 123 | 42 | 72 | 585 | 317 | 244 |

| Item | Nansemond County | Norfolk County | Northampton County | Northumberland County | Richmond County | Westmoreland County | York County | Total |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 26 | 5 | 14 | 74 | 15 | 2 | 30 | 501 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 8 | 2 | 8 | 25 | 5 | | 9 | 155 |
| 11 to 20 tons | 5 | | | 9 | 1 | 1 | 6 | 77 |
| 21 to 30 tons | | | | 3 | | | | 12 |
| 31 to 40 tons | | | | | 1 | | | 5 |
| 71 to 80 tons | | | | | | | | 2 |
| 81 to 90 tons | | | | 1 | | | | 1 |
| 101 to 110 tons | | | | 1 | | | | 1 |
| Total | 13 | 2 | 8 | 39 | 7 | 1 | 15 | 253 |
| Net tonnage | 121 | 19 | 59 | 561 | 85 | 19 | 157 | 3,046 |
| Sail— | | | | | | | | |
| 21 to 30 tons | | | | | | | | 1 |
| Net tonnage | | | | | | | | 30 |
| Total vessels | 13 | 2 | 8 | 39 | 7 | 1 | 15 | 254 |
| Total net tonnage | 121 | 19 | 59 | 561 | 85 | 19 | 157 | 3,076 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Accomac County | Arlington and Westmoreland Counties | Elizabeth City County | Essex and Richmond Counties | Gloucester, King William, and Mathews Counties | Isle of Wight County | Lancaster County |
|---|---|---|---|---|---|---|---|
| Establishments | 77 | 4 | 20 | 5 | 4 | 3 | 30 |
| Persons engaged: | | | | | | | |
| Proprietors | 96 | 4 | 29 | 9 | 5 | 6 | 41 |
| Salaried employees | 7 | 1 | 16 | | 2 | 1 | 3 |
| Wage earners— | | | | | | | |
| Average for season | 600 | 16 | 495 | 94 | 105 | 63 | 823 |
| Average for year | 297 | 7 | 241 | 29 | 52 | 22 | 262 |
| Paid to salaried employees | $6,110 | $1,020 | $30,916 | | $1,190 | $1,040 | $11,000 |
| Paid to wage earners | 190,847 | 4,735 | 151,515 | $13,040 | 28,060 | 11,680 | 130,599 |
| Total salaries and wages | 196,957 | 5,755 | 182,431 | 13,040 | 29,250 | 12,720 | 141,599 |

*Industries related to the fisheries of Virginia, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

OPERATING UNITS, SALARIES, AND WAGES—Continued

| Item | Middlesex County | Norfolk County | Northampton County | Northumberland County | Warwick and York Counties | Total |
|---|---|---|---|---|---|---|
| Establishments | 7 | 15 | 18 | 29 | 8 | 220 |
| Persons engaged: | | | | | | |
| Proprietors | 8 | 24 | 28 | 43 | 10 | 303 |
| Salaried employees | 1 | 37 | 4 | 5 | 1 | 78 |
| Wage earners— | | | | | | |
| Average for season | 127 | 883 | 409 | 791 | 42 | 4,448 |
| Average for year | 41 | 441 | 153 | 245 | 27 | 1,817 |
| Paid to salaried employees | $150 | $63,209 | $4,620 | $20,400 | $1,200 | $140,855 |
| Paid to wage earners | 22,348 | 303,012 | 60,278 | 138,335 | 24,818 | 1,079,267 |
| Total salaries and wages | 22,498 | 366,221 | 64,898 | 158,735 | 26,018 | 1,220,122 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Alewives: | | | |
| Salted | pounds | 6,207,590 | $197,178 |
| Canned | standard cases | 38,239 | 114,540 |
| Roe, canned | do | 36,677 | 185,133 |
| Scrap, dry | tons | 860 | 41,004 |
| Oil | gallons | 31,389 | 6,673 |
| Butterfish, pandressed | pounds | 63,986 | 7,610 |
| Croaker: | | | |
| Pandressed | do | 858,705 | 83,926 |
| Fresh fillets | do | 23,000 | 2,825 |
| Flounders, pandressed | do | 85,565 | 10,032 |
| Haddock, fresh fillets | do | 249,581 | 43,050 |
| Menhaden: | | | |
| Dry scrap and meal | tons | 14,325 | 698,439 |
| Oil | gallons | 1,682,733 | 338,377 |
| Spot, pandressed | pounds | 34,445 | 4,451 |
| Squeteague: | | | |
| Pandressed | do | 802,309 | 85,014 |
| Fresh fillets | do | 213,435 | 35,285 |
| Whiting, pandressed | do | 88,445 | 6,023 |
| Crab meat, packaged (fresh-cooked) | do | 1,364,334 | 510,562 |
| Oysters: | | | |
| Fresh-shucked | gallons | 1,384,836 | 2,340,024 |
| Shell products— | | | |
| Poultry feed | tons | 18,519 | 166,444 |
| Lime | do | 10,798 | 62,186 |
| Lime, "burned" | do | 9,847 | 89,290 |
| Scallops, bay, fresh-shucked | gallons | 64,526 | 84,967 |
| Unclassified products: | | | |
| Packaged [1] | | (2) | 73,478 |
| Oil [3] | gallons | 8,435 | 1,847 |
| By-products [4] | tons | 1,542 | 39,742 |
| Total | | | 5,228,100 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 479]

| | | | |
|---|---|---|---|
| Scallops, bay, fresh-shucked | gallons | 136,000 | $100,000 |

[1] Includes fresh cod and shad fillets, pandressed bluefish and haddock, shucked hard clams, and canned crab meat.
[2] Data not available.
[3] From mixed species.
[4] Includes crab scrap and miscellaneous fish scrap and meal.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country: therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 479 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## SHAD AND ALEWIFE FISHERIES OF THE POTOMAC RIVER

The catch of shad in the Potomac River in 1931 amounted to 294,425 roes, and 331,074 bucks, having a combined weight of 2,061,036 pounds, and a total value to the fishermen of $193,505. The catch of alewives for the same season amounted to 18,380,850 in number with a total weight of 7,352,340 pounds, and a value to the fishermen of $55,460. These figures indicate an increase of 243 per cent in the weight and 97 per cent in the value of shad as compared with 1930 and 136 per cent in the weight and 12 per cent in the value of the alewives. About 70 per cent of the shad were taken in pound nets, nearly 30 per cent in gill nets, and the remainder incidentally with haul seines. More than 99 per cent of the alewives were taken in pound nets. The remainder were taken in gill nets and haul seines.

*Shad and alewife fisheries of the Potomac River, 1931*

| Item | Maryland | | | Virginia | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Pounds | Value | Number | Pounds | Value | Number | Pounds | Value |
| Fishermen on boats and shore— | | | | | | | | | |
| Regular | 51 | | | 324 | | | 375 | | |
| Casual | 131 | | | 175 | | | 306 | | |
| Total | 182 | | | 499 | | | 681 | | |
| Boats: | | | | | | | | | |
| Motor | 53 | | | 165 | | | 218 | | |
| Other | 55 | | | 130 | | | 185 | | |
| Apparatus: | | | | | | | | | |
| Pound nets | 64 | | | 341 | | | 405 | | |
| Gill nets | 700 | | | 764 | | | 1,464 | | |
| Square yards | 266,955 | | | 215,190 | | | 482,145 | | |
| Haul seines | | | | 2 | | | 2 | | |
| Length, yards | | | | 2,100 | | | 2,100 | | |
| Shad caught: | | | | | | | | | |
| With pound nets | 10,037 | 33,308 | $3,786 | 428,528 | 1,398,837 | $143,527 | 438,565 | 1,432,145 | $147,313 |
| With gill nets | 90,380 | 304,210 | 20,645 | 95,354 | 320,631 | 25,220 | 185,734 | 624,841 | 45,865 |
| With haul seines | | | | 1,200 | 4,050 | 327 | 1,200 | 4,050 | 327 |
| Total | 100,417 | 337,518 | 24,431 | 525,082 | 1,723,518 | 169,074 | 625,499 | 2,061,036 | 193,505 |
| Alewives caught: | | | | | | | | | |
| With pound nets | 977,750 | 391,100 | 3,851 | 17,343,100 | 6,937,240 | 51,204 | 18,320,850 | 7,328,340 | 55,055 |
| With gill nets | | | | 55,000 | 22,000 | 385 | 55,000 | 22,000 | 385 |
| With haul seines | | | | 5,000 | 2,000 | 20 | 5,000 | 2,000 | 20 |
| Total | 977,750 | 391,100 | 3,851 | 17,403,100 | 6,961,240 | 51,609 | 18,380,850 | 7,352,340 | 55,460 |

## TRADE IN FRESH, FROZEN, SMOKED, AND PACKAGED FISHERY PRODUCTS IN WASHINGTON, D. C.

The municipal fish wharf and market in Washington, D. C., is located in the southwestern part of the city on an arm of the Potomac River. At the present time 16 fishery firms have stalls in the market, 3 firms are in private buildings across the street, and 4 firms have stalls in the new Center Market. Altogether the 23 above firms employed 120 persons who received $89,542 in salaries and wages during 1931. Of the total employees, 103 were regularly employed. These firms conduct a wholesale and retail business, chiefly wholesale however.

During the year 1931 the receipts of fresh and frozen fishery products as received at the municipal wharf amounted to 9,305,465

pounds. This is an increase of 4 per cent as compared with the year 1930, and an increase of 11 per cent as compared with the 5-year average.

During the year 1931 four firms in Washington, D. C., smoked fishery products which amounted to 268,000 pounds, valued at $27,885. Of this amount, 240,000 pounds valued at $20,950 consisted of herring; 25,050 pounds valued at $6,815 were whitefish while the remainder, 3,000 pounds, valued $120, were alewives or "river herring." There were two firms which shucked oysters mostly for select retail trade. Their production amounted to 7,600 gallons, valued at $16,720. Most of the smoked fish and shucked oysters were marketed in the city.

*Fishery products received at municipal fish wharf and market, Washington, D. C., 1931*

| Species | January | February | March | April | May | June | July |
|---|---|---|---|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Alewives (river herring) | 14,500 | 47,400 | 156,900 | 302,700 | 154,800 | 8,200 | |
| Black bass | 7,600 | 14,700 | 29,500 | 26,400 | 2,400 | 6,800 | 8,200 |
| Bluefish | 200 | 1,400 | 1,100 | 400 | 13,700 | 9,900 | 15,700 |
| Butterfish | 100 | 800 | 1,800 | 3,800 | 45,100 | 60,124 | 65,700 |
| Carp | 16,050 | 5,200 | 15,000 | 5,700 | 12,700 | 5,900 | 2,840 |
| Catfish | 5,500 | 7,500 | 17,800 | 18,900 | 10,100 | 7,900 | 700 |
| Cod | 1,600 | 3,200 | 4,000 | 2,000 | 1,000 | 300 | 400 |
| Croaker | 45,800 | 41,000 | 40,500 | 276,600 | 193,400 | 199,900 | 332,000 |
| Drum, red or redfish | 3,500 | 1,000 | | | 100 | 440 | 150 |
| Eels | 200 | 200 | 200 | 1,300 | 1,400 | 200 | |
| Flounders | 35,800 | 49,700 | 53,700 | 26,600 | 19,900 | 10,000 | 14,800 |
| Gizzard shad | 10,900 | 9,800 | 2,200 | 1,400 | | | |
| Haddock | 44,160 | 54,730 | 75,070 | 60,660 | 36,610 | 29,470 | 29,730 |
| Hake | 200 | | 200 | 1,900 | 3,500 | | |
| Halibut | 5,300 | 4,400 | 9,300 | 8,800 | 5,700 | 7,300 | 5,800 |
| Hickory shad or "jacks" | 700 | 6,300 | 4,900 | 2,400 | 100 | | |
| Hogfish | | | | 500 | 400 | | |
| Kingfish or "king mackerel" | | | | 1,600 | 500 | | |
| King whiting or "kingfish" | | 500 | 600 | | | | |
| Mackerel | 35,400 | 42,600 | 32,800 | 14,100 | 18,300 | 25,510 | 25,900 |
| Mullet | 6,600 | 10,100 | 1,400 | 400 | | 200 | 600 |
| Perch | 11,150 | 8,000 | 25,900 | 33,000 | 6,300 | 2,600 | 1,200 |
| Pike or pickerel | 900 | 1,100 | 1,500 | 1,000 | 600 | 800 | 500 |
| Pollock | 1,300 | 1,300 | 800 | 1,000 | 2,000 | 2,500 | 1,200 |
| Pompano | | 600 | | 200 | | | |
| Salmon | 1,000 | 3,500 | 1,800 | 1,500 | 3,700 | 4,700 | 4,700 |
| Scup or porgy | 7,800 | 26,000 | 27,700 | 8,300 | 3,600 | 4,200 | 1,700 |
| Sea bass | | | | | 100 | | |
| Shad | 34,900 | 13,800 | 55,800 | 234,140 | 377,600 | 7,000 | |
| Sheepshead | | | 200 | | | | |
| Skates | | | 100 | | | | |
| Smelt | 1,200 | 2,825 | 4,530 | 1,200 | | | |
| Snapper, red | 200 | 800 | 200 | 200 | 200 | 300 | 100 |
| Spot | 1,000 | | | | 400 | 10,800 | 31,400 |
| Squeteagues or "sea trout" | 106,400 | 54,100 | 37,500 | 32,900 | 280,400 | 235,500 | 187,000 |
| Striped bass | 3,700 | 4,300 | 12,800 | 38,000 | 8,100 | 2,500 | 3,900 |
| Sturgeon | | | | 100 | 150 | | |
| Swordfish | | | 400 | | | 100 | 500 |
| Tilefish | 600 | 800 | 500 | 400 | 200 | | 100 |
| Whitefish | | 100 | 100 | 100 | | 800 | 900 |
| Whiting | | 2,800 | | | | | |
| Crabs: | | | | | | | |
| Hard | | | | 525 | 16,425 | 76,275 | 103,950 |
| Soft | | | | 2,205 | 12,420 | 11,745 | 11,115 |
| Oyster | | 5 | | | | | |
| Crab meat | 2,000 | 1,795 | 2,990 | 5,925 | 15,505 | 25,905 | 26,730 |
| Lobsters (alive) | 150 | 400 | 850 | 4,350 | 4,050 | 3,750 | 1,800 |
| Lobsters (cooked) | | | 750 | | | | |
| Lobster meat | | 125 | 100 | 190 | 125 | 20 | 325 |
| Shrimp | 5,100 | 6,300 | 8,600 | 4,800 | 8,400 | 8,300 | 4,300 |
| Squid | 2,900 | | | | 300 | 100 | |
| Clams, hard | 5,152 | 3,968 | 5,024 | 6,400 | 6,944 | 6,656 | 7,072 |
| Oysters: | | | | | | | |
| In the shell (meat) | 32,333 | 17,115 | 15,393 | 3,549 | 21 | | |
| Opened (meat) | 78,522 | 64,838 | 60,401 | 16,345 | | | |
| Scallops | 960 | 80 | 560 | 640 | 640 | 280 | |
| Frogs | | 13 | | 84 | 134 | 95 | 15 |
| Terrapin | 1,024 | 144 | | 80 | | | |
| Turtles | 872 | | 144 | 416 | 968 | 620 | 96 |
| Total | 533,273 | 515,338 | 711,612 | 1,153,709 | 1,268,992 | 777,690 | 891,123 |

*Fishery products received at municipal fish wharf and market, Washington, D. C., 1931*—Continued

| Species | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| Alewives (river herring) | | | | | | 684,500 |
| Black bass | 3,900 | 4,200 | 4,300 | 2,200 | 3,800 | 114,000 |
| Bluefish | 13,400 | 18,700 | 34,300 | 11,500 | 5,600 | 125,900 |
| Butterfish | 48,500 | 40,300 | 41,100 | 78,500 | 25,718 | 411,542 |
| Carp | 1,500 | 11,500 | 7,500 | 8,000 | 9,600 | 101,490 |
| Catfish | 700 | 7,900 | 15,300 | 22,000 | 16,400 | 130,700 |
| Cod | 500 | 500 | 800 | 1,000 | 2,800 | 18,100 |
| Croaker | 180,600 | 148,400 | 76,300 | 59,600 | 89,500 | 1,683,600 |
| Drum, red or redfish | | | 30 | 200 | | 5,420 |
| Eels | | 200 | 1,500 | 2,000 | 3,400 | 10,600 |
| Flounders | 9,700 | 17,100 | 21,500 | 33,000 | 29,900 | 321,700 |
| Gizzard shad | | | 400 | 240 | 8,800 | 33,740 |
| Haddock | 14,180 | 16,270 | 24,895 | 24,030 | 32,300 | 442,105 |
| Hake | | | | 800 | 5,800 | 12,400 |
| Halibut | 4,700 | 5,900 | 6,600 | 5,000 | 3,600 | 72,400 |
| Hickory shad or "jacks" | | | | | | 14,400 |
| Hogfish | 200 | 200 | | | | 1,300 |
| Kingfish or "king mackerel" | 600 | 200 | | 200 | 4,400 | 7,500 |
| King whiting or "kingfish" | | | 1,500 | 2,600 | | 5,200 |
| Mackerel | 15,600 | 19,400 | 11,800 | 10,400 | 14,200 | 266,010 |
| Mullet | 400 | 4,400 | 8,600 | 11,900 | 4,400 | 49,000 |
| Perch | 2,500 | 5,400 | 8,100 | 6,700 | 10,800 | 121,650 |
| Pike or pickerel | 600 | 2,000 | 1,700 | 1,100 | 500 | 12,300 |
| Pollock | 2,400 | 400 | 2,100 | 1,200 | 400 | 16,600 |
| Pompano | | | | | | 800 |
| Salmon | 2,400 | 3,600 | 3,100 | 3,100 | 1,600 | 34,700 |
| Scup or porgy | 500 | 400 | | | 1,200 | 81,400 |
| Sea bass | | | | | | 100 |
| Shad | | | | | | 723,240 |
| Sheepshead | | | | 200 | | 400 |
| Skates | | | | | | 100 |
| Smelt | | | | 60 | 705 | 10,520 |
| Snapper, red | 500 | 1,100 | 400 | 600 | 300 | 4,900 |
| Spot | 51,200 | 115,400 | 125,400 | 15,800 | 4,200 | 355,600 |
| Squeteagues or "sea trout" | 133,300 | 208,600 | 278,600 | 223,500 | 108,800 | 1,886,600 |
| Striped bass | 2,600 | 6,600 | 22,900 | 17,700 | 12,600 | 135,700 |
| Sturgeon | | | 80 | 200 | | 530 |
| Swordfish | 600 | 800 | 500 | | | 2,900 |
| Tilefish | 400 | | | 300 | 200 | 3,500 |
| Whitefish | 900 | 1,900 | 900 | 800 | 600 | 7,100 |
| Whiting | | | | | | 2,800 |
| Crabs: | | | | | | |
| Hard | 60,750 | 51,450 | 10,050 | 75 | | 319,500 |
| Soft | 12,195 | 15,795 | 9,270 | 135 | | 74,880 |
| Oyster | | | | | | 5 |
| Crab meat | 14,285 | 12,645 | 11,450 | 5,835 | 4,875 | 129,940 |
| Sea crawfish or "spiny lobster" | | | | 150 | 50 | 200 |
| Lobsters (alive) | 650 | 750 | 2,850 | 1,350 | 650 | 21,000 |
| Lobsters (cooked) | | | | | | 750 |
| Lobster meat | 100 | 30 | 135 | 50 | | 1,200 |
| Shrimp | 5,200 | 3,900 | 7,900 | 5,800 | 3,400 | 72,000 |
| Squid | | | 100 | 400 | 2,400 | 6,200 |
| Clams, hard | 6,720 | 6,880 | 5,920 | 3,552 | 4,096 | [1] 68,334 |
| Oysters: | | | | | | |
| In the shell (meat) | | 2,044 | 26,355 | 50,442 | 105,413 | [2] 252,665 |
| Opened (meat) | | 2,686 | 48,781 | 63,149 | 98,411 | [3] 433,133 |
| Scallops | 160 | 240 | 720 | 1,280 | 1,080 | 6,640 |
| Frogs | | | 12 | | | 353 |
| Terrapin | | | 600 | | | 1,848 |
| Turtles | 4 | | | | | 3,120 |
| Total | 592,444 | 737,790 | 824,348 | 676,648 | 622,498 | 9,305,465 |

[1] 8,548 bushels. [2] 36,095 bushels. [3] 49,501 gallons.

NOTE.—The clams have been reduced to pounds on the basis of 8 pounds of meat to a bushel, the oysters on the basis of 7 pounds of meat to a bushel, and 8¾ pounds to a gallon.

## FISHERIES OF THE SOUTH ATLANTIC AND GULF STATES[9]

The yield of fishery products in the South Atlantic and Gulf States (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas) during 1930 amounted to 417,759,466

[9] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure" which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

pounds, valued at $11,064,819. This is a decrease of 22 per cent in the volume of the catch and 26 per cent in its value as compared with the previous year. Of the total catch in 1930, 301,218,657 pounds, valued at $5,277,727, were fish, and 116,540,809 pounds, valued at $5,787,092, were shellfish and miscellaneous products. These fisheries gave employment to 23,590 fishermen or a decrease of 11 per cent as compared with the previous year. Of the total number of fishermen employed during 1930, 3,454 regular fishermen were engaged on vessels and 15,965 regular and 4,171 casual fishermen were employed in the boat and shore fisheries.

*Fisheries of the South Atlantic and Gulf States, 1930*

SUMMARY OF CATCH

| Product | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 163,145,785 | $1,469,682 | 1,017,836 | $83,337 | 25,610,484 | $181,160 |
| Shellfish, etc | 5,792,920 | 366,799 | 4,087,761 | 169,522 | 9,262,037 | 355,134 |
| Total | 168,938,705 | 1,836,481 | 5,105,597 | 252,859 | 34,872,521 | 536,294 |

| Product | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 99,740,175 | $2,829,759 | 3,761,479 | $192,423 | 1,671,153 | $87,787 |
| Shellfish, etc | 20,674,961 | 1,815,993 | 3,351,760 | 123,045 | 14,064,377 | 652,347 |
| Total | 120,415,136 | 4,645,752 | 7,113,239 | 315,468 | 15,735,530 | 740,134 |

| Product | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Fish | 1,954,586 | $114,678 | 4,317,159 | $318,901 | 301,218,657 | $5,277,727 |
| Shellfish, etc | 47,931,314 | 1,845,679 | 11,375,679 | 458,573 | 116,540,809 | 5,787,092 |
| Total | 49,885,900 | 1,960,357 | 15,692,838 | 777,474 | 417,759,466 | 11,064,819 |

OPERATING UNITS: BY STATES

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 1,159 | 39 | 144 | 867 | 142 | 555 | 370 | 178 | 3,454 |
| On boats and shore— | | | | | | | | | |
| Regular | 2,693 | 705 | 371 | 6,176 | 469 | 1,355 | 2,775 | 1,421 | 15,965 |
| Casual | 1,353 | 756 | 472 | 737 | 55 | 193 | 238 | 367 | 4,171 |
| Total | 5,205 | 1,500 | 987 | 7,780 | 666 | 2,103 | 3,383 | 1,966 | 23,590 |
| Vessels: | | | | | | | | | |
| Steam | | | 3 | | | | | | 3 |
| Net tonnage | | | 166 | | | | | | 166 |
| Motor | 110 | 10 | 24 | 98 | 30 | 125 | 148 | 44 | 589 |
| Net tonnage | 2,140 | 124 | 195 | 3,174 | 335 | 1,678 | 1,074 | 535 | 9,255 |
| Sail | 67 | | | 6 | | 5 | | | 78 |
| Net tonnage | 631 | | | 527 | | 66 | | | 1,224 |
| Total vessels | 177 | 10 | 27 | 104 | 30 | 130 | 148 | 44 | 670 |
| Total net tonnage | 2,771 | 124 | 361 | 3,701 | 335 | 1,744 | 1,074 | 535 | 10,645 |

*Fisheries of the South Atlantic and Gulf States, 1930*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Boats: | | | | | | | | | |
| Motor | 1,375 | 51 | 178 | 2,332 | 185 | 401 | 997 | 431 | 5,950 |
| Other | 1,586 | 969 | 421 | 3,220 | 183 | 615 | 1,073 | 498 | 8,565 |
| Accessory boats | 123 | | 12 | 21 | 13 | | | | 169 |
| Apparatus: | | | | | | | | | |
| Purse seines— | | | | | | | | | |
| Menhaden | 52 | | 3 | 17 | | | | | 72 |
| Length, yards | 13,335 | | 900 | 4,960 | | | | | 19,195 |
| Other | 4 | | | 2 | | | | | 6 |
| Length, yards | 700 | | | 600 | | | | | 1,300 |
| Haul seines— | | | | | | | | | |
| Common | 580 | 21 | 16 | 173 | 8 | 45 | 138 | 63 | 1,044 |
| Length, yards | 80,708 | 3,535 | 1,850 | 64,220 | 5,900 | 9,220 | 27,875 | 11,250 | 204,558 |
| Long | 87 | | | 80 | | | | | 167 |
| Length, yards | 84,650 | | | 64,200 | | | | | 148,850 |
| Gill nets— | | | | | | | | | |
| Anchor | 2,529 | 282 | 27 | 42 | | | | 2 | 2,882 |
| Square yards | 1,287,852 | 82,000 | 6,090 | 25,200 | | | | 2,000 | 1,403,142 |
| Drift | 170 | 157 | 146 | 212 | | | | | 685 |
| Square yards | 172,203 | 160,790 | 275,045 | 330,450 | | | | | 938,488 |
| Runaround | 426 | 27 | 45 | 2,213 | | | 1 | 102 | 2,814 |
| Square yards | 198,979 | 13,000 | 14,310 | 2,812,854 | | | 30 | 23,854 | 3,063,027 |
| Stake | 11,229 | | 105 | 2 | | | | 383 | 11,719 |
| Square yards | 741,300 | | 54,540 | 1,080 | | | | 95,294 | 892,214 |
| Trammel nets | | | | 180 | 84 | 55 | 50 | 80 | 449 |
| Square yards | | | | 129,568 | 28,692 | 17,785 | 13,712 | 26,651 | 216,408 |
| Lines— | | | | | | | | | |
| Hand | 98 | 127 | 8 | 1,579 | 149 | 167 | 147 | 459 | 2,734 |
| Hooks | 396 | 460 | 16 | 2,809 | 271 | 201 | 152 | 678 | 4,983 |
| Troll | 15 | | | 1,309 | 2 | | | 8 | 1,334 |
| Hooks | 15 | | | 1,814 | 2 | | | 8 | 1,839 |
| Trot, with baits or snoods | 177 | 6 | 6 | 8 | 14 | 66 | 288 | 33 | 598 |
| Baits or snoods | 122,800 | 4,800 | 1,950 | 1,700 | 2,475 | 20,795 | 58,370 | 4,300 | 217,190 |
| Trot, with hooks | 14 | | 68 | 241 | 177 | | 3 | 36 | 539 |
| Hooks | 840 | | 3,400 | 106,740 | 17,900 | | 300 | 5,500 | 134,680 |
| Pound nets | 2,343 | | | 52 | | | | | 2,395 |
| Weirs | 4 | | | | | | | | 4 |
| Wheels | 50 | | | | | | | | 50 |
| Fyke nets | 847 | | 60 | 2,950 | 119 | | | | 3,976 |
| Dip nets— | | | | | | | | | |
| Common | 244 | 10 | | 62 | | | | | 316 |
| Drop | | | | 31 | | 232 | 1,700 | | 1,963 |
| Cast nets | | | 40 | 44 | | 54 | 3 | | 141 |
| Otter trawls— | | | | | | | | | |
| Fish | 4 | | | | | | | | 4 |
| Yards at mouth | 74 | | | | | | | | 74 |
| Shrimp | 52 | 36 | 182 | 327 | 138 | 363 | 940 | 264 | 2,302 |
| Yards at mouth | 908 | 675 | 3,774 | 5,689 | 1,800 | 4,607 | 12,213 | 3,855 | 33,521 |
| Box traps | 10 | | | | | | | | 10 |
| Wire baskets | | | | 520 | | | | | 520 |
| Turtle traps | 30 | | | | | | | | 30 |
| Pots— | | | | | | | | | |
| Crab | | | 30 | 1,383 | | | | | 1,413 |
| Eel | 1,502 | | | 90 | | | | | 1,592 |
| Sea crawfish | | | | 2,533 | | | | | 2,533 |
| Spears | 54 | 30 | | 26 | 21 | 76 | | 175 | 382 |
| Dredges— | | | | | | | | | |
| Clam | | | | 1 | | | 72 | | 73 |
| Yards at mouth | | | | | | | 72 | | 72 |
| Crab | 80 | | | | | | | | 80 |
| Yards at mouth | 107 | | | | | | | | 107 |
| Oyster | 243 | 2 | | | | 437 | | 38 | 720 |
| Yards at mouth | 241 | 3 | | | | 443 | | 37 | 724 |
| Scallop | 328 | | | 2 | | | | | 330 |
| Yards at mouth | 318 | | | 2 | | | | | 320 |
| Tongs | 480 | 77 | 108 | 420 | 116 | 440 | 526 | 330 | 2,497 |
| Rakes | 643 | 47 | 6 | | | | | | 696 |
| Forks | | | | 58 | | | | | 58 |
| Grabs | | 501 | 84 | | | | | | 585 |
| Hooks— | | | | | | | | | |
| Sea crawfish and stone crab | | | | 2,000 | | | | | 2,000 |
| Sponge | | | | 283 | | | | | 283 |
| Diving apparatus | | | | 55 | | | | | 55 |

*Fisheries of the South Atlantic and Gulf States, 1930*—Continued

CATCH: BY STATES

| Species | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Alewives | 9,838,727 | $68,308 | 2,000 | $10 | | |
| Black bass | 106,413 | 15,545 | | | | |
| Bluefish | 842,935 | 41,781 | 100 | 10 | 1,012 | $227 |
| Bonito | 18,850 | 470 | | | | |
| Bowfin | 19,230 | 568 | | | | |
| Butterfish | 182,560 | 4,301 | | | | |
| Carp | 470,189 | 32,409 | | | | |
| Catfish and bullheads | 460,072 | 20,307 | 2,000 | 40 | 228,000 | 7,100 |
| Cero | 9,000 | 680 | | | | |
| Cod | 1,200 | 45 | | | | |
| Crappie | 650 | 110 | | | | |
| Croaker | 5,108,310 | 75,419 | 2,000 | 60 | 15,500 | 310 |
| Drum: | | | | | | |
| Black | | | 500 | 25 | 1,000 | 30 |
| Red or redfish | 145,050 | 2,474 | 8,350 | 466 | 5,250 | 210 |
| Eels | 142,260 | 10,787 | | | | |
| Flounders | 349,800 | 17,458 | 30,025 | 2,266 | 8,800 | 613 |
| Garfish | 100 | 6 | | | | |
| Gizzard shad | 38,991 | 614 | | | | |
| Groupers | | | | | 7,354 | 441 |
| Grunts | 18,000 | 360 | 8,000 | 640 | 390 | 32 |
| Harvestfish or "starfish" | 843,300 | 10,111 | | | | |
| Hickory shad | 323,960 | 13,857 | 7,500 | 330 | 25,500 | 2,010 |
| Jewfish | | | | | 4,629 | 232 |
| King whiting or "kingfish" | 272,350 | 11,165 | 38,080 | 3,451 | 38,250 | 1,463 |
| Menhaden | 134,051,240 | 535,631 | | | 24,701,250 | 94,100 |
| Mullet | 2,386,350 | 91,434 | 412,000 | 20,972 | 176,800 | 9,795 |
| Pigfish | 94,200 | 1,596 | 725 | 22 | | |
| Pike or pickerel | 9,970 | 1,137 | | | | |
| Pinfish or sailors choice | 31,900 | 480 | 2,000 | 80 | | |
| Pompano | 8,600 | 907 | 100 | 15 | | |
| Porgies | 1,000 | 30 | 100 | 8 | | |
| Sea bass | 173,250 | 7,975 | 197,250 | 15,587 | 22,840 | 2,085 |
| Shad | 1,172,161 | 209,989 | 214,492 | 32,365 | 274,755 | 54,751 |
| Sharks | | | 10,000 | 200 | | |
| Sheepshead | 11,615 | 585 | 100 | 10 | 700 | 42 |
| Skates | | | 1,000 | 50 | | |
| Snappers: | | | | | | |
| Mangrove | | | 3,000 | 240 | 200 | 16 |
| Red | 4,750 | 195 | | | 29,854 | 2,462 |
| Spadefish | 430 | 17 | | | | |
| Spanish mackerel | 131,165 | 11,776 | | | | |
| Spot | 2,326,790 | 38,334 | 28,300 | 669 | 11,950 | 219 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 2,333,127 | 82,613 | 24,000 | 1,720 | 3,000 | 130 |
| Spotted | 694,309 | 58,271 | 10,900 | 1,090 | 48,450 | 3,892 |
| Squirrelfish | 150 | 6 | 350 | 18 | | |
| Striped bass | 456,876 | 60,550 | | | 500 | 100 |
| Sturgeon | 2,600 | 840 | 14,964 | 2,993 | 4,500 | 900 |
| Suckers | 15,650 | 724 | | | | |
| Sunfish | 8,797 | 185 | | | | |
| Tripletail | 500 | 19 | | | | |
| White perch | 442,208 | 32,992 | | | | |
| Yellow perch | 96,200 | 6,621 | | | | |
| Total | 163,145,785 | 1,469,682 | 1,017,836 | 83,337 | 25,610,484 | 181,160 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: [1] | | | | | | |
| Hard | 1,159,500 | 18,995 | 26,000 | 780 | 228,000 | 4,560 |
| Soft | 378,580 | 57,068 | | | | |
| Stone | 350 | 11 | | | | |
| Shrimp | 1,298,610 | 40,752 | 792,733 | 31,814 | 8,852,712 | 334,576 |
| Clams, hard, public [1] | 316,720 | 40,680 | 11,200 | 1,400 | 2,240 | 350 |
| Oysters: [2] | | | | | | |
| Market, public, spring | 1,166,258 | 72,725 | 1,742,057 | 58,887 | 29,978 | 2,740 |
| Market, public, fall | 1,039,416 | 82,423 | 683,960 | 25,914 | 21,161 | 1,440 |
| Market, private, spring | | | 546,078 | 33,363 | 50,709 | 3,423 |
| Market, private, fall | | | 276,414 | 14,988 | 57,537 | 3,005 |
| Scallops, bay | 431,826 | 53,923 | | | | |
| Octopus | 1,000 | 150 | 3,500 | 290 | | |
| Terrapin, diamond-back | 90 | 45 | 5,819 | 2,086 | 19,700 | 5,040 |

*See footnotes at end of table.*

*Fisheries of the South Atlantic and Gulf States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC.—continued | | | | | | |
| Turtles: | | | | | | |
| Loggerhead | 70 | $2 | | | | |
| Snappers | 500 | 25 | | | | |
| Total | 5,792,920 | 366,799 | 4,087,761 | $169,522 | 9,262,037 | $355,134 |
| Grand total | 168,938,705 | 1,836,481 | 5,105,597 | 252,859 | 34,872,521 | 536,294 |

| Species | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Alewives | 365,732 | $5,486 | | | | |
| Amberjack | 21,220 | 667 | | | | |
| Black bass | 333,086 | 31,615 | | | | |
| Bluefish | 1,153,547 | 65,954 | 20,654 | $926 | 19,191 | $1,047 |
| Blue runner or hardtail | 754,245 | 14,000 | 2,205 | 63 | | |
| Bonito | 1,190 | 24 | | | | |
| Buffalofish | | | 100,855 | 5,503 | 14,969 | 680 |
| Cabio or crab eater | 10,307 | 437 | 2,200 | 100 | 1,837 | 98 |
| Catfish and bullheads | 4,346,231 | 192,912 | 90,904 | 6,001 | 61,422 | 2,792 |
| Cero | 9,950 | 480 | | | | |
| Cigarfish | 58,412 | 1,752 | | | | |
| Crappie | 898,976 | 34,389 | | | | |
| Crevalle | 90,356 | 2,459 | 2,558 | 70 | 9,957 | 272 |
| Croaker | 33,020 | 735 | 7,447 | 247 | 11,275 | 397 |
| Dolphin | 5,000 | 500 | | | | |
| Drum: | | | | | | |
| Black | 34,624 | 893 | 11,693 | 569 | 20,755 | 972 |
| Red or redfish | 1,023,884 | 34,033 | 104,334 | 6,107 | 122,030 | 6,721 |
| Eels | 17,143 | 856 | | | | |
| Flounders | 119,611 | 6,252 | 24,180 | 1,960 | 68,989 | 6,001 |
| Groupers | 3,064,802 | 92,194 | 177,945 | 5,338 | 71,093 | 2,133 |
| Grunts | 21,883 | 657 | | | | |
| Hickory shad | 29,616 | 888 | | | | |
| Hogfish | 2,000 | 100 | | | | |
| Jewfish | 26,050 | 782 | 5,021 | 151 | 1,274 | 38 |
| Kingfish or "king mackerel" | 3,685,865 | 175,006 | | | | |
| King whiting or "kingfish" | 153,133 | 5,165 | 5,798 | 199 | 5,604 | 183 |
| Menhaden | 40,414,170 | 176,446 | | | | |
| Mojarro | 81,275 | 2,508 | | | | |
| Mullet | 22,021,806 | 669,468 | 2,205,378 | 86,007 | 801,755 | 32,120 |
| Muttonfish | 225,039 | 15,446 | | | | |
| Paddlefish or spoonbill cat | | | 2,251 | 125 | | |
| Permit | 14,882 | 449 | | | | |
| Pigfish | 62,155 | 1,601 | | | | |
| Pinfish or sailors choice | 78,050 | 1,524 | | | | |
| Pompano | 573,353 | 111,716 | 5,062 | 790 | 791 | 228 |
| Porgies | 55,033 | 1,643 | | | | |
| Porkfish | 600 | 36 | | | | |
| Sea bass | 48,640 | 3,206 | | | | |
| Shad | 879,732 | 129,014 | | | | |
| Sharks | 2,187,500 | 3,500 | | | | |
| Sheepshead | 872,133 | 29,768 | 17,569 | 988 | 30,517 | 1,735 |
| Snappers: | | | | | | |
| Mangrove | 121,820 | 4,847 | | | | |
| Red | 5,035,702 | 427,140 | 847,918 | 67,833 | 188,725 | 15,875 |
| Snook or sergeantfish | 368,109 | 11,275 | | | | |
| Spadefish | 48,561 | 1,445 | 110 | 3 | | |
| Spanish mackerel | 6,140,217 | 294,175 | 5,808 | 338 | 1,355 | 88 |
| Spot | 142,556 | 4,012 | 1,561 | 66 | | |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 599,200 | 43,355 | 6,587 | 246 | 107,167 | 3,720 |
| Spotted | 2,790,566 | 202,541 | 105,981 | 8,268 | 125,112 | 12,344 |
| Sturgeon | 8,410 | 1,259 | 1,816 | 297 | 73 | 22 |
| Sunfish | 434,183 | 13,043 | | | | |
| Tenpounder | 181,361 | 5,213 | 5,369 | 215 | 4,725 | 142 |
| Tripletail | 4,869 | 168 | 275 | 13 | 2,537 | 179 |
| Turbot | 900 | 54 | | | | |
| Yellowtail | 89,470 | 6,671 | | | | |
| Total | 99,740,175 | 2,829,759 | 3,761,479 | 192,423 | 1,671,153 | 87,787 |

*Fisheries of the South Atlantic and Gulf States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC. | | | | | | |
| Crabs: [1] | | | | | | |
| Hard | 111,295 | $4,103 | 79,968 | $1,142 | $673,281 | $11,129 |
| Soft | | | 780 | 195 | 5,800 | 1,740 |
| Stone | 307,550 | 26,630 | | | | |
| Sea crawfish or spiny lobster | 288,309 | 26,731 | | | | |
| Shrimp | 16,848,576 | 635,506 | 2,982,200 | 97,219 | 8,489,050 | 318,871 |
| Clams: [2] | | | | | | |
| Hard, public | 687,888 | 44,540 | | | | |
| Hard, private | 23,688 | 1,890 | | | | |
| Conchs | 20,000 | 200 | | | | |
| Oysters: [3] | | | | | | |
| Market, public, spring | 790,168 | 51,468 | 40,144 | 3,755 | 3,959,190 | 260,061 |
| Market, public, fall | 878,242 | 81,104 | 225,506 | 17,723 | 937,056 | 60,546 |
| Market, private, spring | 35,545 | 3,063 | 4,080 | 480 | | |
| Market, private, fall | 79,298 | 6,563 | 17,064 | 1,896 | | |
| Scallops, bay | 21,867 | 2,139 | | | | |
| Terrapin, diamond-back | 406 | 83 | 2,018 | 635 | | |
| Turtles: | | | | | | |
| Green | 21,550 | 1,078 | | | | |
| Soft-shell | 11,578 | 235 | | | | |
| Sponges: | | | | | | |
| Grass | 82,918 | 26,556 | | | | |
| Sheepswool | 370,465 | 858,699 | | | | |
| Velvet | 682 | 409 | | | | |
| Wire | 3,781 | 2,041 | | | | |
| Yellow | 91,155 | 42,955 | | | | |
| Total | 20,674,961 | 1,815,993 | 3,351,760 | 123,045 | 14,064,377 | 652,347 |
| Grand total | 120,415,136 | 4,645,752 | 7,113,239 | 315,468 | 15,735,530 | 740,134 |

| Species | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Alewives | | | | | 10,206,459 | $73,804 |
| Amberjack | | | | | 21,220 | 667 |
| Black bass | | | | | 439,499 | 47,160 |
| Bluefish | | | 165 | $14 | 2,037,604 | 109,959 |
| Blue runner or hardtail | | | | | 756,450 | 14,063 |
| Bonito | | | | | 20,040 | 494 |
| Bowfin | | | | | 19,230 | 568 |
| Buffalofish | | | | | 115,824 | 6,183 |
| Butterfish | | | | | 182,560 | 4,301 |
| Cabio or crab eater | | | | | 14,344 | 635 |
| Carp | | | | | 470,189 | 32,409 |
| Catfish and bullheads | 89,143 | $3,213 | 97,572 | 4,380 | 5,375,344 | 236,745 |
| Cero | | | | | 18,950 | 1,160 |
| Cigarfish | | | | | 58,412 | 1,752 |
| Cod | | | | | 1,200 | 45 |
| Crappie | | | | | 899,626 | 34,499 |
| Crevalle | 165 | 15 | 154 | 4 | 103,190 | 2,820 |
| Croaker | 59,863 | 4,205 | 31,913 | 1,095 | 5,269,328 | 82,468 |
| Dolphin | | | | | 5,000 | 500 |
| Drum: | | | | | | |
| Black | 166,436 | 6,451 | 1,051,968 | 33,056 | 1,286,976 | 42,596 |
| Red or redfish | 334,882 | 25,959 | 872,597 | 72,446 | 2,616,377 | 148,416 |
| Eels | | | | | 159,403 | 11,643 |
| Flounders | 23,067 | 2,083 | 71,297 | 7,083 | 695,769 | 43,716 |
| Garfish | 1,320 | 120 | | | 1,420 | 126 |
| Gizzard shad | | | | | 38,991 | 614 |
| Groupers | 3,500 | 105 | 20,855 | 630 | 3,345,549 | 100,841 |
| Grunts | | | | | 48,273 | 1,689 |
| Harvestfish or "starfish" | | | | | 343,300 | 10,111 |
| Hickory shad | | | | | 386,576 | 17,085 |
| Hogfish | | | | | 2,000 | 100 |
| Jewfish | 6,000 | 180 | 1,430 | 56 | 44,404 | 1,439 |
| Kingfish or "king mackerel" | | | 3,080 | 120 | 3,688,945 | 175,126 |
| King whiting or "kingfish" | 54,367 | 1,704 | 15,730 | 572 | 583,312 | 23,902 |
| Menhaden | | | | | 199,166,660 | 806,177 |
| Mojarro | | | | | 81,275 | 2,508 |
| Mullet | 8,972 | 311 | 7,921 | 232 | 28,020,982 | 910,339 |
| Muttonfish | | | | | 225,039 | 15,446 |
| Paddlefish or spoonbill cat | | | | | 2,251 | 125 |
| Permit | | | | | 14,882 | 449 |
| Pigfish | | | | | 157,080 | 3,219 |
| Pike or pickerel | | | | | 9,970 | 1,137 |

See footnotes at end of table.

*Fisheries of the South Atlantic and Gulf States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH—continued | | | | | | |
| Pinfish or sailors choice | | | | | 111,950 | $2,084 |
| Pompano | 1,112 | $301 | 13,010 | $2,963 | 602,028 | 116,920 |
| Porgies | | | | | 56,133 | 1,681 |
| Porkfish | | | | | 600 | 36 |
| Sea bass | | | | | 441,980 | 28,853 |
| Shad | | | | | 2,541,140 | 426,119 |
| Sharks | 300,000 | 1,400 | | | 2,497,500 | 5,100 |
| Sheepshead | 102,124 | 5,993 | 42,251 | 1,933 | 1,077,009 | 41,054 |
| Skates | | | | | 1,000 | 50 |
| Snappers: | | | | | | |
| Mangrove | | | | | 125,020 | 5,103 |
| Red | 76,400 | 6,112 | 929,578 | 75,385 | 7,112,927 | 595,002 |
| Snook or sergeantfish | | | 39,446 | 2,816 | 407,555 | 14,091 |
| Spadefish | | | 550 | 20 | 49,651 | 1,485 |
| Spanish mackerel | 1,800 | 108 | 74,289 | 4,176 | 6,354,634 | 310,661 |
| Spot | 9,704 | 290 | | | 2,520,861 | 43,590 |
| Squeteagues or "sea trout". | | | | | | |
| Gray | 323,329 | 9,809 | | | 3,396,410 | 141,593 |
| Spotted | 387,101 | 45,864 | 1,043,353 | 111,320 | 5,205,772 | 443,590 |
| Squirrelfish | | | | | 500 | 24 |
| Striped bass | | | | | 457,376 | 60,650 |
| Sturgeon | | | | | 32,363 | 6,311 |
| Suckers | | | | | 15,650 | 724 |
| Sunfish | | | | | 442,980 | 13,228 |
| Tenpounder | | | | | 191,455 | 5,570 |
| Tripletail | 5,301 | 455 | | | 13,482 | 834 |
| Turbot | | | | | 900 | 54 |
| White perch | | | | | 442,208 | 32,992 |
| Yellow perch | | | | | 96,200 | 6,621 |
| Yellowtail | | | | | 89,470 | 6,671 |
| Total | 1,954,586 | 114,678 | 4,317,159 | 318,901 | 301,218,657 | 5,277,727 |
| SHELLFISH, ETC. | | | | | | |
| Crabs: [1] | | | | | | |
| Hard | 4,185,995 | 63,457 | 29,046 | 1,063 | 6,493,085 | 105,229 |
| Soft | 145,732 | 58,068 | | | 530,892 | 117,071 |
| Stone | | | | | 307,900 | 26,641 |
| Sea crawfish or spiny lobster | | | | | 288,309 | 26,731 |
| Shrimp | 38,664,487 | 1,159,626 | 10,189,318 | 377,016 | 88,117,686 | 2,995,380 |
| Clams: [2] | | | | | | |
| Hard, public | | | | | 1,018,048 | 86,970 |
| Hard, private | | | | | 23,688 | 1,890 |
| Conchs | | | | | 20,000 | 200 |
| Oysters: [3] | | | | | | |
| Market, public, spring | 271,464 | 11,751 | 515,752 | 35,888 | 8,515,011 | 497,275 |
| Market, public, fall | 406,668 | 24,940 | 633,819 | 43,396 | 4,825,828 | 337,486 |
| Market, private, spring | 1,797,832 | 201,657 | 3,040 | 475 | 2,437,284 | 242,461 |
| Market, private, fall | 2,370,336 | 311,698 | 4,704 | 735 | 2,805,353 | 338,885 |
| Scallops, bay | | | | | 453,693 | 56,062 |
| Octopus | | | | | 4,500 | 440 |
| Terrapin, diamond-back | 38,750 | 12,980 | | | 66,783 | 20,869 |
| Turtles: | | | | | | |
| Green | | | | | 21,550 | 1,078 |
| Loggerhead | 50,050 | 1,502 | | | 50,120 | 1,504 |
| Snappers | | | | | 500 | 25 |
| Soft-shell | | | | | 11,578 | 235 |
| Sponges: | | | | | | |
| Grass | | | | | 82,918 | 26,556 |
| Sheepswool | | | | | 370,465 | 858,699 |
| Velvet | | | | | 682 | 409 |
| Wire | | | | | 3,781 | 2,041 |
| Yellow | | | | | 91,155 | 42,955 |
| Total | 47,931,314 | 1,845,679 | 11,375,679 | 458,573 | 116,540,809 | 5,787,092 |
| Grand total | 49,885,900 | 1,960,357 | 15,692,838 | 777,474 | 417,759,466 | 11,064,819 |

[1] Statistics on hard crabs used in this table are based on 4 pounds per dozen in North Carolina, South Carolina, and Georgia; 6.45 pounds in Florida; 7 pounds in Alabama, Mississippi, and Texas; and 6.34 pounds in Louisiana. In reports for previous years, hard crabs in these States have been computed at 4 pounds per dozen.

[2] Statistics on hard clams used in this table are based on 8 pounds of meats per bushel in Florida, and 10 pounds in the other States. In reports for previous years, all hard clams in these States have been computed on the basis of a uniform yield of 8 pounds of meats to the bushel.

[3] Statistics on market oysters used in this table are based on yields of 5.36 pounds of meats per bushel in North Carolina, 4.61 pounds in South Carolina, 4.41 pounds in Georgia, 3.34 pounds in Florida, 3.23 pounds in Alabama, 1.91 pounds in Mississippi, 3.99 pounds in Louisiana, and 4.65 pounds in Texas. In reports for previous years, all oysters have been computed on the basis of a uniform yield of 7 pounds of meats to the bushel.

*Fisheries of the South Atlantic and Gulf States, 1930*—Continued

PRODUCTION OF CERTAIN SHELLFISH IN NUMBERS AND BUSHELS

| Product | North Carolina | | South Carolina | | Georgia | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Crabs: | | | | | | |
| Hard ... number | 3,478,500 | $18,995 | 78,000 | $780 | 684,000 | $4,560 |
| Soft ... do | 1,135,740 | 57,068 | | | | |
| Clams, hard, public ... bushels | 31,672 | 40,680 | 1,120 | 1,400 | 224 | 350 |
| Oysters: | | | | | | |
| Market, public, spring ... do | 217,505 | 72,725 | 377,870 | 58,887 | 6,800 | 2,740 |
| Market, public, fall ... do | 193,849 | 82,423 | 148,358 | 25,914 | 4,800 | 1,440 |
| Market, private, spring ... do | | | 118,450 | 33,363 | 11,502 | 3,423 |
| Market, private, fall ... do | | | 59,957 | 14,988 | 13,051 | 3,005 |
| Scallops, bay ... do | 71,971 | 53,923 | | | | |

| Product | Florida | | Alabama | | Mississippi | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Crabs: | | | | | | |
| Hard ... number | 206,988 | $4,103 | 137,088 | $1,142 | 1,154,196 | $11,129 |
| Soft ... do | | | 2,340 | 195 | 17,400 | 1,740 |
| Clams: | | | | | | |
| Hard, public ... bushels | 85,986 | 44,540 | | | | |
| Hard, private ... do | 2,961 | 1,890 | | | | |
| Oysters: | | | | | | |
| Market, public, spring ... do | 236,577 | 51,468 | 12,440 | 3,755 | 2,070,706 | 260,061 |
| Market, public, fall ... do | 263,096 | 81,104 | 69,881 | 17,723 | 490,092 | 60,546 |
| Market, private, spring ... do | 10,672 | 3,063 | 1,264 | 480 | | |
| Market, private, fall ... do | 23,742 | 6,563 | 5,288 | 1,896 | | |
| Scallops, bay ... do | 3,644 | 2,189 | | | | |

| Product | Louisiana | | Texas | | Total | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Crabs: | | | | | | |
| Hard ... number | 7,794,780 | $63,457 | 49,785 | $1,063 | 13,583,337 | $105,229 |
| Soft ... do | 437,196 | 58,068 | | | 1,592,676 | 117,071 |
| Clams: | | | | | | |
| Hard, public ... bushels | | | | | 119,002 | 86,970 |
| Hard, private ... do | | | | | 2,961 | 1,890 |
| Oysters: | | | | | | |
| Market, public, spring ... do | 68,087 | 11,751 | 110,938 | 35,888 | 3,100,923 | 497,275 |
| Market, public, fall ... do | 101,998 | 24,940 | 136,334 | 43,396 | 1,408,408 | 337,486 |
| Market, private, spring ... do | 450,924 | 201,657 | 654 | 475 | 593,466 | 242,461 |
| Market, private, fall ... do | 594,516 | 311,698 | 1,012 | 735 | 697,566 | 338,885 |
| Scallops, bay ... do | | | | | 75,615 | 56,062 |

*Industries related to the fisheries of the South Atlantic and Gulf States, 1930*

| Item | North Carolina | South Carolina | Georgia | Florida | Alabama |
|---|---|---|---|---|---|
| Transporting: | | | | | |
| Persons engaged— | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 54 | 184 | ---------- | 51 | 12 |
| On boats | 5 | 7 | ---------- | 47 | 18 |
| Total | 59 | 191 | ---------- | 98 | 30 |
| Vessels— | | | | | |
| Motor | 33 | 13 | ---------- | 24 | 6 |
| Net tonnage | 315 | 138 | ---------- | 379 | 55 |
| Sail | ---------- | 40 | ---------- | 3 | ---------- |
| Net tonnage | ---------- | 368 | ---------- | 41 | ---------- |
| Total vessels | 33 | 53 | ---------- | 27 | 6 |
| Total net tonnage | 315 | 506 | ---------- | 420 | 55 |
| Boats | 3 | 33 | ---------- | 41 | 3 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 71 | 32 | 29 | 224 | 21 |
| Persons engaged— | | | | | |
| Proprietors | 90 | 30 | 25 | 279 | 31 |
| Salaried employees | 26 | 27 | 27 | 106 | 16 |
| Wage earners: | | | | | |
| Average for season | 1,052 | 1,327 | 1,090 | 1,837 | 492 |
| Average for year | 305 | 491 | 407 | 861 | 218 |
| Salaries and wages paid | $233,924 | $259,398 | $253,445 | $900,298 | $138,240 |
| Manufactured products [1] | $836,751 | $882,538 | $629,668 | $1,995,751 | $329,990 |
| Fishermen's manufactured products: | | | | | |
| Persons engaged | 417 | 37 | ---------- | 240 | 46 |
| Products | $130,219 | $28,937 | ---------- | $46,277 | $7,699 |

| Item | Mississippi | Louisiana | Texas | Total |
|---|---|---|---|---|
| Transporting: | | | | |
| Persons engaged— | *Number* | *Number* | *Number* | *Number* |
| On vessels | ---------- | 133 | 3 | 437 |
| On boats | 26 | 246 | ---------- | 349 |
| Total | 26 | 379 | 3 | 786 |
| Vessels— | | | | |
| Motor | ---------- | 65 | 1 | 142 |
| Net tonnage | ---------- | 525 | 6 | 1,418 |
| Sail | ---------- | ---------- | ---------- | 43 |
| Net tonnage | ---------- | ---------- | ---------- | 409 |
| Total vessels | ---------- | 65 | 1 | 185 |
| Total net tonnage | ---------- | 525 | 6 | 1,827 |
| Boats | 13 | 128 | ---------- | 221 |
| Wholesale and manufacturing: | | | | |
| Establishments | 53 | 102 | 55 | 587 |
| Persons engaged— | | | | |
| Proprietors | 72 | 133 | 66 | 726 |
| Salaried employees | 37 | 100 | 35 | 374 |
| Wage earners: | | | | |
| Average for season | 2,546 | 3,821 | 1,370 | 13,535 |
| Average for year | 1,056 | 1,783 | 727 | 5,848 |
| Salaries and wages paid | $475,692 | $938,868 | $264,176 | $3,464,041 |
| Manufactured products [1] | $2,141,119 | $4,618,333 | $886,255 | $12,320,405 |
| Fishermen's manufactured products: | | | | |
| Persons engaged | 61 | ---------- | 210 | 1,011 |
| Products | $9,658 | ---------- | $42,375 | $265,165 |

[1] These production figures are not comparable with those shown in previous bulletins since packaged fresh and frozen fishery products are now included.

NOTE.—Of the total number of persons employed on transporting craft, 408 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 904 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## NORTH CAROLINA

*Fisheries of North Carolina, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | Other | Common | Long | Anchor | Drift | Run-around | Stake |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 734 | | 18 | 138 | 81 | | | |
| On boats and shore— | | | | | | | | |
| Regular | 56 | 28 | 1,092 | 308 | 310 | 189 | 193 | 324 |
| Casual | 8 | | 500 | 19 | 93 | 20 | 117 | 97 |
| Total | 798 | 28 | 1,610 | 465 | 484 | 209 | 310 | 421 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 8 | | 6 | 34 | 15 | | | |
| 11 to 20 tons | 5 | | | 2 | 1 | | | |
| 21 to 30 tons | 3 | | | | | | | |
| 31 to 40 tons | 10 | | | | | | | |
| 41 to 50 tons | 6 | | | | | | | |
| 51 to 60 tons | 6 | | | | | | | |
| 61 to 70 tons | 3 | | | | | | | |
| 71 to 80 tons | 2 | | | | | | | |
| 81 to 90 tons | 1 | | | | | | | |
| Total | 44 | | 6 | 36 | 16 | | | |
| Net tonnage | 1,634 | | 37 | 249 | 114 | | | |
| Boats: | | | | | | | | |
| Motor | 8 | 4 | 241 | 93 | 176 | 81 | 84 | 219 |
| Other | | 8 | 540 | 55 | 140 | 75 | 137 | 123 |
| Accessory boats | 104 | | 2 | 15 | | | | |
| Apparatus: | | | | | | | | |
| Number | 52 | 4 | 580 | 87 | 2,529 | 170 | 426 | 11,229 |
| Length, yards | 13,335 | 700 | 80,708 | 84,050 | | | | |
| Square yards | | | | | 1,287,852 | 172,203 | 198,979 | 741,300 |

| Item | Lines | | | | Pound nets | Weirs | Wheels | Fyke nets | Dip nets, common | Otter trawls | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hand | Troll | Trot, with baits or snoods | Trot, with hooks | | | | | | Fish | Shrimp |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | |
| On vessels | 15 | | | | | | | | | 12 | 10 |
| On boats and shore— | | | | | | | | | | | |
| Regular | 4 | 15 | 104 | 8 | 499 | 1 | 6 | 42 | 133 | | 92 |
| Casual | 40 | | 72 | 1 | 207 | | 10 | 11 | 111 | | 2 |
| Total | 59 | 15 | 176 | 9 | 706 | 1 | 16 | 53 | 244 | 12 | 104 |
| Vessels: | | | | | | | | | | | |
| Motor— | | | | | | | | | | | |
| 5 to 10 tons | 4 | | | | | | | | | | 5 |
| 11 to 20 tons | | | | | | | | | | 3 | |
| 21 to 30 tons | | | | | | | | | | 1 | |
| Total | 4 | | | | | | | | | 4 | 5 |
| Net tonnage | 29 | | | | | | | | | 70 | 38 |
| Boats: | | | | | | | | | | | |
| Motor | 12 | 15 | 99 | | 285 | 1 | 6 | 33 | 10 | | 47 |
| Other | 10 | | 60 | 9 | 248 | | 20 | 27 | 202 | | |
| Accessory boats | 2 | | | | | | | | | | |
| Apparatus: | | | | | | | | | | | |
| Number | 98 | 15 | 177 | 14 | 2,343 | 4 | 50 | 847 | 244 | 4 | 52 |
| Yards at mouth | | | | | | | | | | 74 | 908 |
| Hooks, baits, or snoods | 396 | 15 | 122,800 | 840 | | | | | | | |

*Fisheries of North Carolina, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Box traps | Turtle traps | Pots, eel | Spears | Dredges | | | Tongs | Rakes | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crab | Oyster | Scallop | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | | |
| On vessels | | | | | | 220 | | 3 | | | 1,159 |
| On boats and shore— | | | | | | | | | | | |
| Regular | | 1 | 34 | 6 | 40 | 65 | 155 | 216 | 271 | 100 | 2,693 |
| Casual | 10 | | 20 | 48 | | 41 | 29 | 261 | 327 | 95 | 1,353 |
| Total | 10 | 1 | 54 | 54 | 40 | 326 | 184 | 480 | 598 | 195 | 5,205 |
| Vessels: | | | | | | | | | | | |
| Motor— | | | | | | | | | | | |
| 5 to 10 tons | | | | | | 7 | | | | | 67 |
| 11 to 20 tons | | | | | | 1 | | | | | 11 |
| 21 to 30 tons | | | | | | | | | | | 4 |
| 31 to 40 tons | | | | | | | | | | | 10 |
| 41 to 50 tons | | | | | | | | | | | 6 |
| 51 to 60 tons | | | | | | | | | | | 6 |
| 61 to 70 tons | | | | | | | | | | | 3 |
| 71 to 80 tons | | | | | | | | | | | 2 |
| 81 to 90 tons | | | | | | | | | | | 1 |
| Total | | | | | | 8 | | | | | 110 |
| Net tonnage | | | | | | 68 | | | | | 2,140 |
| Sail— | | | | | | | | | | | |
| 5 to 10 tons | | | | | | 49 | | 1 | | | 50 |
| 11 to 20 tons | | | | | | 14 | | | | | 14 |
| 21 to 30 tons | | | | | | 3 | | | | | 3 |
| Total | | | | | | 66 | | 1 | | | 67 |
| Net tonnage | | | | | | 624 | | 7 | | | 631 |
| Total vessels | | | | | | 74 | | 1 | | | 177 |
| Total net tonnage | | | | | | 692 | | 7 | | | 2,771 |
| Boats: | | | | | | | | | | | |
| Motor | 4 | 1 | 16 | | 40 | 39 | 134 | 192 | 58 | | 1,375 |
| Other | 4 | | 35 | 54 | | 26 | 10 | 201 | 441 | 80 | 1,586 |
| Accessory boats | | | | | | | | | | | 123 |
| Apparatus: | | | | | | | | | | | |
| Number | 10 | 30 | 1,502 | 54 | 80 | 243 | 328 | 480 | 643 | | |
| Yards at mouth | | | | | 107 | 241 | 318 | | | | |

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | Common | | Long | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 1,998,727 | $10,208 | 164,900 | $1,148 |
| Black bass | | | | | 56,143 | 8,005 | 32,770 | 4,915 |
| Bluefish | | | | | 198,650 | 10,631 | 120,200 | 4,993 |
| Bonito | | | | | 7,850 | 237 | | |
| Bowfin | | | | | 4,929 | 123 | 2,301 | 52 |
| Butterfish | | | | | 2,600 | 90 | 3,385 | 915 |
| Carp | | | | | 182,225 | 12,622 | 123,864 | 9,089 |
| Catfish and bullheads | | | | | 91,350 | 3,082 | 59,322 | 2,305 |
| Cod | | | | | 400 | 8 | | |
| Croaker | | | | | 733,000 | 10,080 | 2,024,760 | 32,225 |
| Drum, red or redfish | | | | | 21,800 | 472 | 91,050 | 1,328 |
| Eels | | | | | 100 | 7 | 1,610 | 125 |
| Flounders | | | | | 35,450 | 1,668 | 13,800 | 709 |
| Gizzard shad | | | | | 5,900 | 113 | 7,591 | 124 |
| Harvestfish | | | | | 15,750 | 420 | 170,500 | 5,420 |
| Hickory shad | | | | | 45,710 | 1,517 | 8,000 | 280 |
| King whiting or "kingfish" | | | | | 70,050 | 2,723 | 13,800 | 482 |
| Menhaden | 133,656,440 | $534,478 | | | | | 394,800 | 1,153 |
| Mullet | 79,010 | 2,288 | | | 923,240 | 36,160 | 277,200 | 8,496 |
| Pigfish | | | | | 7,500 | 151 | 71,700 | 1,199 |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Purse seines | | | | Haul seines | | | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | Common | | Long | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Pike or pickerel | | | | | 4,330 | $472 | 1,190 | $145 |
| Pinfish | | | | | | | 30,000 | 450 |
| Pompano | | | | | 900 | 128 | 2,200 | 221 |
| Porgies | | | | | 1,000 | 30 | | |
| Sea bass | | | | | 47,200 | 2,760 | | |
| Shad | | | | | 48,411 | 9,086 | 10,450 | 2,089 |
| Sheepshead | | | | | 2,300 | 112 | 3,590 | 179 |
| Spadefish | | | | | | | 380 | 16 |
| Spanish mackerel | | | | | 9,150 | 608 | 1,815 | 146 |
| Spot | | | | | 840,250 | 13,234 | 662,000 | 11,563 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 399,450 | 15,968 | 419,937 | 16,370 |
| Spotted | | | | | 251,000 | 21,535 | 229,409 | 17,303 |
| Striped bass | | | 10,000 | $1,500 | 151,486 | 11,493 | 52,040 | 9,470 |
| Sunfish | | | | | 6,275 | 131 | 1,722 | 35 |
| White perch | | | | | 178,962 | 13,051 | 98,246 | 6,115 |
| Yellow perch | | | | | 23,600 | 1,326 | 11,400 | 718 |
| Crabs: | | | | | | | | |
| Soft | | | | | 207,796 | 33,363 | | |
| Stone | | | | | 350 | 11 | | |
| Shrimp | | | | | 94,250 | 3,497 | | |
| Turtles, loggerhead | | | | | 70 | 2 | | |
| Total | 133,735,450 | $536,766 | 10,000 | 1,500 | 6,658,154 | 225,124 | 5,133,932 | 134,778 |

| Species | Gill nets | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Runaround | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 451,000 | $3,880 | 21,000 | $105 | 4,000 | $23 | 195,200 | $1,179 |
| Bluefish | 79,000 | 3,360 | 71,000 | 3,240 | 56,350 | 3,257 | 246,150 | 11,244 |
| Bonito | 1,000 | 33 | 10,000 | 200 | | | | |
| Butterfish | 2,100 | 69 | | | | | 1,500 | 23 |
| Carp | 3,750 | 295 | | | | | 600 | 30 |
| Catfish and bullheads | 10,800 | 532 | | | | | | |
| Cod | 300 | 15 | | | | | | |
| Croaker | 622,000 | 10,260 | 71,000 | 870 | 47,000 | 810 | 156,950 | 1,966 |
| Drum, red or redfish | 6,200 | 171 | 2,000 | 40 | 900 | 50 | 4,100 | 50 |
| Eels | 300 | 21 | | | | | | |
| Flounders | 3,100 | 165 | 1,000 | 40 | 6,000 | 293 | 4,350 | 169 |
| Gizzard shad | 10,000 | 143 | | | | | | |
| Harvestfish | 1,000 | 30 | | | | | | |
| Hickory shad | 38,900 | 2,505 | | | | | 73,700 | 2,799 |
| King whiting or "kingfish" | 130,500 | 5,820 | 1,000 | 40 | | | 700 | 26 |
| Mullet | 8,600 | 448 | 355,000 | 12,525 | 536,200 | 22,138 | 195,950 | 13,795 |
| Pigfish | 4,700 | 92 | | | 300 | 3 | 2,800 | 57 |
| Pompano | | | 100 | 10 | 100 | 10 | 100 | 13 |
| Sea bass | | | | | 10,000 | 500 | | |
| Shad | 310,500 | 53,687 | 52,200 | 10,280 | 4,800 | 770 | 250,450 | 45,115 |
| Sheepshead | | | 350 | 15 | 450 | 33 | | |
| Spanish mackerel | 7,000 | 560 | 30,500 | 2,940 | 50,000 | 5,000 | 3,500 | 222 |
| Spot | 199,500 | 3,128 | 85,500 | 1,560 | 154,000 | 2,760 | 110,050 | 2,056 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 198,000 | 8,005 | 22,000 | 880 | 18,200 | 659 | 117,190 | 4,772 |
| Spotted | 20,000 | 2,100 | 11,000 | 900 | 50,700 | 4,671 | 105,450 | 91,211 |
| Squirrelfish | | | | | | | 100 | 5 |
| Striped bass | 84,200 | 13,660 | 100 | 20 | 1,000 | 120 | 33,350 | 4,675 |
| Sturgeon | | | 1,500 | 600 | | | | |
| Suckers | 5,500 | 220 | | | | | 1,600 | 136 |
| White perch | 27,200 | 2,712 | | | | | | |
| Yellow perch | 3,400 | 340 | | | | | | |
| Total | 2,228,550 | 112,251 | 735,250 | 34,265 | 940,000 | 41,097 | 1,503,790 | 97,543 |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hand | | Troll | | Trot, with baits or snoods | | Trot, with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 7,750 | $745 | | | | | | |
| Catfish and bullheads | 1,000 | 100 | | | | | 23,100 | $693 |
| Cero | 2,000 | 120 | 7,000 | $560 | | | | |
| Crappie | 250 | 50 | | | | | | |
| Drum, red or redfish | 1,000 | 20 | | | | | | |
| Eels | 500 | 25 | | | | | | |
| Flounders | 200 | 8 | | | | | | |
| Grunts | 18,000 | 360 | | | | | | |
| Pigfish | 500 | 10 | | | | | | |
| Pinfish | 500 | 8 | | | | | | |
| Sea bass | 116,000 | 4,710 | | | | | | |
| Sheepshead | 250 | 12 | | | | | | |
| Snapper, red | 4,750 | 195 | | | | | | |
| Spanish mackerel | | | 15,000 | 1,200 | | | | |
| Squirrelfish | 50 | 1 | | | | | | |
| Crabs, hard | | | | | 1,146,500 | $18,745 | | |
| Octopus | 1,000 | 150 | | | | | | |
| Total | 153,750 | 6,514 | 22,000 | 1,760 | 1,146,500 | 18,745 | 23,100 | 693 |

| Species | Pound nets | | Weirs | | Wheels | | Fyke nets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 6,799,500 | $50,107 | | | 135,000 | $825 | 59,400 | $733 |
| Black bass | | | | | | | 17,500 | 2,625 |
| Bluefish | 11,535 | 555 | | | | | | |
| Bowfin | 1,300 | 36 | | | | | 10,700 | 357 |
| Butterfish | 146,475 | 3,227 | | | | | | |
| Carp | 51,350 | 2,213 | 5,000 | $250 | | | 102,500 | 7,917 |
| Catfish and bullheads | 145,700 | 7,395 | | | | | 128,200 | 6,170 |
| Cod | 300 | 12 | | | | | | |
| Crappie | 400 | 60 | | | | | | |
| Croaker | 1,113,600 | 13,358 | | | | | | |
| Drum, red or redfish | 18,000 | 343 | | | | | | |
| Eels | 4,000 | 332 | | | | | 3,250 | 300 |
| Flounders | 110,400 | 5,109 | | | | | 13,300 | 1,187 |
| Garfish | 100 | 6 | | | | | | |
| Gizzard shad | 10,500 | 143 | | | | | 5,000 | 91 |
| Harvestfish | 156,050 | 4,241 | | | | | | |
| Hickory shad | 157,150 | 6,726 | | | | | 500 | 30 |
| King whiting or "kingfish" | 16,000 | 664 | | | | | | |
| Mullet | 9,050 | 416 | | | | | 2,100 | 168 |
| Pigfish | 6,700 | 84 | | | | | | |
| Pike or pickerel | 1,000 | 150 | | | | | 3,450 | 370 |
| Pinfish | 1,400 | 22 | | | | | | |
| Pompano | 5,200 | 525 | | | | | | |
| Sea bass | 50 | 5 | | | | | | |
| Shad | 493,650 | 88,622 | | | | | 1,200 | 240 |
| Sheepshead | 4,675 | 234 | | | | | | |
| Spadefish | 50 | 1 | | | | | | |
| Spanish mackerel | 14,200 | 1,100 | | | | | | |
| Spot | 270,490 | 3,933 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1,118,350 | 34,615 | | | | | | |
| Spotted | 24,950 | 2,371 | | | | | | |
| Striped bass | 106,350 | 15,569 | | | | | 16,350 | 3,643 |
| Sturgeon | 1,100 | 240 | | | | | | |
| Suckers | 8,300 | 401 | | | | | 1,150 | 33 |
| Sunfish | 500 | 13 | | | | | 300 | 6 |
| Tripletail | 500 | 19 | | | | | | |
| White perch | 89,000 | 8,185 | | | | | 47,200 | 2,793 |
| Yellow perch | 8,700 | 626 | | | 6,000 | 900 | 42,100 | 2,486 |
| Turtle, snapper | 200 | 10 | | | | | | |
| Total | 10,906,775 | 251,668 | 5,000 | 250 | 141,000 | 1,725 | 454,200 | 29,149 |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Dip nets, common | | Otter trawls | | | | Box traps | |
|---|---|---|---|---|---|---|---|---|
| | | | Fish | | Shrimp | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | 20,000 | $100 | | | | | | |
| Bluefish | | | 2,300 | $256 | 50,000 | $3,500 | | |
| Cod | | | 200 | 10 | | | | |
| Croaker | | | 340,000 | 5,850 | | | | |
| Flounders | | | 80,000 | 3,800 | 54,200 | 2,690 | | |
| King whiting or "kingfish" | | | 15,200 | 608 | 25,100 | 802 | | |
| Shad | 500 | 100 | | | | | | |
| Spot | | | 5,000 | 100 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 9,700 | 435 | 30,300 | 909 | | |
| Spotted | | | | | 1,800 | 180 | | |
| Striped bass | 1,000 | 150 | | | | | 1,000 | $250 |
| Suckers | | | | | | | 700 | 70 |
| Yellow perch | | | | | | | 1,000 | 225 |
| Crabs, soft | 99,974 | 15,032 | | | | | | |
| Shrimp | | | | | 1,204,360 | 37,255 | | |
| Total | 121,474 | 15,382 | 452,400 | 11,059 | 1,365,760 | 45,336 | 2,700 | 545 |

| Species | Turtle traps | | Pots, eel | | Spears | | Dredges | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Crab | | Oyster | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | | | 132,500 | $9,977 | | | | | | |
| Flounders | | | | | 28,000 | $1,620 | | | | |
| Crabs, soft | | | | | | | 60,000 | $7,200 | | |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | | | | | 790,388 | $49,652 |
| Market, public, fall | | | | | | | | | 720,599 | 60,413 |
| Turtles, snapper | 300 | $15 | | | | | | | | |
| Total | 300 | 15 | 132,500 | 9,977 | 28,000 | 1,620 | 60,000 | 7,200 | 1,516,987 | 110,065 |

| Species | Dredges—Scallop | | Tongs | | Rakes | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs: | | | | | | | | |
| Hard | 13,000 | $250 | | | | | | |
| Soft | 10,810 | 1,473 | | | | | | |
| Clams, hard, public | | | 35,200 | $3,775 | 243,120 | $31,480 | 38,400 | $5,425 |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 364,508 | 22,673 | | | 5,362 | 400 |
| Market, public, fall | | | 254,366 | 18,592 | | | 64,451 | 3,418 |
| Scallops, bay | 256,656 | 32,030 | | | 175,170 | 21,893 | | |
| Terrapin, diamond-back | | | | | | | 90 | 45 |
| Total | 280,466 | 33,753 | 654,074 | 45,040 | 418,290 | 53,373 | 108,303 | 9,288 |

OPERATING UNITS: BY COUNTIES

| Item | Beaufort | Bertie | Brunswick | Camden | Carteret | Chowan | Craven | Currituck |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 56 | | 179 | | 788 | 3 | 3 | |
| On boats and shore— | | | | | | | | |
| Regular | 151 | 25 | 81 | 8 | 1,102 | | 11 | 278 |
| Casual | 93 | 15 | 51 | | 248 | 169 | 70 | 1 |
| Total | 300 | 40 | 311 | 8 | 2,138 | 172 | 84 | 279 |

*Fisheries of North Carolina, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Beaufort | Bertie | Brunswick | Camden | Carteret | Chowan | Craven | Currituck |
|---|---|---|---|---|---|---|---|---|
| Vessels: | | | | | | | | |
| Motor— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | | | 4 | | 52 | | 1 | |
| 11 to 20 tons | | | | | 7 | | | |
| 21 to 30 tons | | | | | 3 | 1 | | |
| 31 to 40 tons | | | 4 | | 6 | | | |
| 41 to 50 tons | | | 2 | | 4 | | | |
| 51 to 60 tons | | | 1 | | 5 | | | |
| 61 to 70 tons | | | 1 | | 2 | | | |
| 71 to 80 tons | | | | | 2 | | | |
| 81 to 90 tons | | | 1 | | | | | |
| Total | | | 13 | | 81 | 1 | 1 | |
| Net tonnage | | | 477 | | 1,502 | 21 | 5 | |
| Sail— | | | | | | | | |
| 5 to 10 tons | 18 | | | | 13 | | | |
| 11 to 20 tons | 2 | | | | 6 | | | |
| 21 to 30 tons | 2 | | | | | | | |
| Total | 22 | | | | 19 | | | |
| Net tonnage | 213 | | | | 185 | | | |
| Total vessels | 22 | | 13 | | 100 | 1 | 1 | |
| Total net tonnage | 213 | | 477 | | 1,687 | 21 | 5 | |
| Boats: | | | | | | | | |
| Motor | 93 | 16 | 26 | 5 | 460 | 45 | 45 | 116 |
| Other | 91 | 16 | 45 | 5 | 495 | 45 | 31 | 119 |
| Accessory boats | | | 18 | | 97 | | 2 | |
| Apparatus: | | | | | | | | |
| Purse seines— | | | | | | | | |
| Menhaden | | | 9 | | 43 | | | |
| Length, yards | | | 2,335 | | 11,000 | | | |
| Haul seines— | | | | | | | | |
| Common | 13 | | 9 | | 305 | | 4 | 101 |
| Length, yards | 3,950 | | 1,500 | | 21,946 | | 900 | 18,850 |
| Long | | 1 | | | 42 | | 1 | 12 |
| Length, yards | | 1,600 | | | 48,900 | | 900 | 10,200 |
| Gill nets— | | | | | | | | |
| Anchor | | | | 90 | 102 | 200 | 14 | 183 |
| Square yards | | | | 21,300 | 92,276 | 150,000 | 4,800 | 58,025 |
| Drift | | | | | 86 | | | |
| Square yards | | | | | 75,283 | | | |
| Runaround | 7 | | 42 | | 108 | | 4 | |
| Square yards | 2,820 | | 16,212 | | 83,214 | | 2,000 | |
| Stake | 712 | 3 | | | 1,696 | | 378 | 110 |
| Square yards | 47,100 | 400 | | | 110,160 | | 14,970 | 9,900 |
| Lines— | | | | | | | | |
| Hand | | | | | 28 | | | |
| Hooks | | | | | 56 | | | |
| Troll | | | | | 15 | | | |
| Hooks | | | | | 15 | | | |
| Trot, with baits or snoods | 86 | | | | | | | |
| Baits or snoods | 63,600 | | | | | | | |
| Trot, with hooks | | | 2 | | | | | |
| Hooks | | | 240 | | | | | |
| Pound nets | 192 | 80 | | | 142 | 507 | 43 | |
| Wheels | | 5 | | | | | 30 | |
| Fyke nets | | | | 75 | | 4 | | 475 |
| Dip nets, common | | | | | 231 | | | |
| Otter trawls— | | | | | | | | |
| Fish | | | | | | 1 | | |
| Yards at mouth | | | | | | 20 | | |
| Shrimp | | | 30 | | 21 | | | |
| Yards at mouth | | | 495 | | 396 | | | |
| Pots, eel | 45 | | | | 50 | 150 | 40 | 860 |
| Spears | | | | | 19 | | | |
| Dredges— | | | | | | | | |
| Crab | | | | | 80 | | | |
| Yards at mouth | | | | | 107 | | | |
| Oyster | 64 | | | | 36 | | | |
| Yards at mouth | 54 | | | | 44 | | | |
| Scallop | | | | | 328 | | | |
| Yards at mouth | | | | | 318 | | | |
| Tongs | | | 10 | | 208 | | | |
| Rakes | | | 15 | | 347 | | | |

*Fisheries of North Carolina, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Dare | Gates | Hertford | Hyde | Lenoir | Martin | New Hanover | Onslow |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 3 | | | 3 | | | | 3 |
| On boats and shore— | | | | | | | | |
| Regular | 589 | | 6 | 81 | | 18 | 140 | 4 |
| Casual | | 20 | | 25 | 35 | 22 | 50 | 115 |
| Total | 592 | 20 | 6 | 109 | 35 | 40 | 190 | 122 |
| Vessels: | | | | | | | | |
| Motor—5 to 10 tons | 1 | | | | | | | 1 |
| Net tonnage | 7 | | | | | | | 8 |
| Sail—5 to 10 tons | | | | 1 | | | | |
| Net tonnage | | | | 6 | | | | |
| Boats: | | | | | | | | |
| Motor | 229 | 2 | 2 | 46 | 4 | 8 | 45 | 45 |
| Other | 189 | 20 | 3 | 32 | 16 | 26 | 90 | 50 |
| Apparatus: | | | | | | | | |
| Purse seines—Other | 4 | | | | | | | |
| Length, yards | 700 | | | | | | | |
| Haul seines— | | | | | | | | |
| Common | 67 | | | | 4 | 3 | 22 | 22 |
| Length, yards | 19,800 | | | | 300 | 950 | 3,520 | 2,042 |
| Long | 27 | | | 2 | | | | |
| Length, yards | 19,850 | | | 1,400 | | | | |
| Gill nets— | | | | | | | | |
| Anchor | 560 | | | | | | | 14 |
| Square yards | 222,950 | | | | | | | 15,000 |
| Drift | | 20 | | 10 | | 12 | 42 | |
| Square yards | | 2,000 | | 11,660 | | 850 | 82,410 | |
| Runaround | 14 | | | 11 | | | 70 | 140 |
| Square yards | 8,400 | | | 12,833 | | | 10,300 | 53,200 |
| Stake | 6,473 | | | 695 | 15 | 2 | | |
| Square yards | 474,570 | | | 44,700 | 600 | 78 | | |
| Lines— | | | | | | | | |
| Hand | | | | | 20 | | | 50 |
| Hooks | | | | | 40 | | | 300 |
| Trot, with baits or snoods | 7 | | | 2 | | | | |
| Baits or snoods | 5,600 | | | 1,600 | | | | |
| Trot, with hooks | | | | | | 7 | 5 | |
| Hooks | | | | | | 350 | 250 | |
| Pound nets | 807 | 10 | 17 | 95 | | | | |
| Weirs | | | | | | 4 | | |
| Wheels | | | | | | 15 | | |
| Fyke nets | 8 | 25 | | | | 2 | | |
| Dip nets, common | | | | | | 12 | | |
| Box traps | | | | | 10 | | | |
| Turtle traps | | | | 30 | | | | |
| Pots, eel | 100 | | | 5 | | 16 | | |
| Spears | | | | | | | | 20 |
| Dredges— | | | | | | | | |
| Oyster | 14 | | | 41 | | | | |
| Yards at mouth | 14 | | | 32 | | | | |
| Tongs | 26 | | | 30 | | | | 55 |
| Rakes | 6 | | | | | | 50 | 25 |

| Item | Pamlico | Pasquotank | Pender | Perquimans | Pitt | Tyrrell | Washington |
|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 102 | 19 | | | | | |
| On boats and shore— | | | | | | | |
| Regular | 32 | 39 | 7 | 43 | 2 | 48 | 28 |
| Casual | 149 | | 190 | | 10 | 40 | 50 |
| Total | 283 | 58 | 197 | 43 | 12 | 88 | 78 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | 6 | 2 | | | | | |
| 11 to 20 tons | | 4 | | | | | |
| Total | 6 | 6 | | | | | |
| Net tonnage | 41 | 79 | | | | | |

*Fisheries of North Carolina, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Pamlico | Pamlico-tank | Pender | Perquimans | Pitt | Tyrrell | Washington |
|---|---|---|---|---|---|---|---|
| Vessels—Continued. | | | | | | | |
| Sail— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | 18 | | | | | | |
| 11 to 20 tons | 5 | 1 | | | | | |
| 21 to 30 tons | 1 | | | | | | |
| Total | 24 | 1 | | | | | |
| Net tonnage | 216 | 11 | | | | | |
| Total vessels | 30 | 7 | | | | | |
| Total net tonnage | 257 | 90 | | | | | |
| Boats: | | | | | | | |
| Motor | 89 | 19 | 4 | 23 | 1 | 36 | 16 |
| Other | 66 | 20 | 145 | 23 | 2 | 36 | 21 |
| Accessory boats | 6 | | | | | | |
| Apparatus: | | | | | | | |
| Haul seines— | | | | | | | |
| Common | 8 | | 19 | | 1 | | 2 |
| Length, yards | 1,900 | | 2,850 | | 600 | | 1,600 |
| Long | 2 | | | | | | |
| Length, yards | 1,800 | | | | | | |
| Gill nets— | | | | | | | |
| Anchor | | 556 | | 425 | | 265 | 120 |
| Square yards | | 214,120 | | 317,050 | | 131,411 | 60,920 |
| Runaround | | | 30 | | | | |
| Square yards | | | 10,000 | | | | |
| Stake | 445 | 60 | | | | 640 | |
| Square yards | 12,950 | 2,400 | | | | 23,472 | |
| Lines— | | | | | | | |
| Trot with baits or snoods | 82 | | | | | | |
| Baits or snoods | 52,000 | | | | | | |
| Pound nets | 179 | 22 | | 62 | | 120 | 67 |
| Fyke nets | | 124 | | | | 134 | |
| Dip nets, common | | | | | | | 1 |
| Otter trawls— | | | | | | | |
| Fish | | 3 | | | | | |
| Yards at mouth | | 54 | | | | | |
| Shrimp | | | 1 | | | | |
| Yards at mouth | | | 17 | | | | |
| Pots, eel | 40 | 36 | | 100 | | 60 | |
| Spears | | | 15 | | | | |
| Dredges— | | | | | | | |
| Oyster | 80 | 8 | | | | | |
| Yards at mouth | 88 | 9 | | | | | |
| Tongs | 91 | | 60 | | | | |
| Rakes | | | 200 | | | | |

CATCH: BY COUNTIES

| Species | Beaufort | | Bertie | | Brunswick | | Camden | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 391,000 | $1,964 | 1,188,000 | $5,940 | | | 16,000 | $175 |
| Black bass | | | | | | | 2,500 | 375 |
| Bluefish | | | | | 50,000 | $3,500 | | |
| Bowfin | | | | | | | 1,200 | 24 |
| Butterfish | 15,000 | 300 | | | | | | |
| Carp | 19,200 | 565 | | | | | 8,000 | 640 |
| Catfish and bullheads | 14,200 | 630 | 1,000 | 50 | 2,100 | 63 | 3,000 | 120 |
| Croaker | 187,000 | 1,910 | | | 32,000 | 320 | | |
| Drum, red or redfish | | | | | 1,800 | 108 | | |
| Eels | 10,000 | 1,000 | | | | | 600 | 45 |
| Flounders | 17,800 | 819 | | | 54,200 | 2,690 | 100 | 5 |
| Gizzard shad | | | | | | | 500 | 8 |
| Hickory shad | 16,700 | 481 | | | | | 500 | 25 |
| King whiting or "kingfish" | | | | | 26,100 | 862 | | |
| Menhaden | | | | | 24,325,200 | 121,344 | | |
| Mullet | 32,700 | 1,358 | | | 237,510 | 9,188 | 1,500 | 120 |
| Pigfish | 500 | 15 | | | | | | |
| Pike or pickerel | | | | | | | 250 | 25 |
| Pompano | 100 | 10 | | | | | | |
| Sea bass | | | | | 17,200 | 860 | | |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Beaufort | | Bertie | | Brunswick | | Camden | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Shad | 65,550 | $15,182 | 11,400 | $1,760 | 3,800 | $570 | 1,500 | $300 |
| Sheepshead | 150 | 12 | | | 300 | 21 | | |
| Spot | 12,000 | 230 | | | 14,000 | 280 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 69,000 | 2,070 | | | 31,000 | 930 | | |
| Spotted | 4,500 | 450 | | | 11,800 | 1,180 | | |
| Striped bass | 7,300 | 755 | 3,500 | 425 | | | 3,000 | 600 |
| White perch | 4,400 | 440 | 22,000 | 1,630 | | | 6,800 | 430 |
| Yellow perch | 3,100 | 205 | | | | | 2,500 | 125 |
| Crabs, hard | 761,200 | 8,782 | | | | | | |
| Shrimp | | | | | 453,500 | 13,305 | | |
| Clams, hard, public | | | | | 20,800 | 3,100 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 86,711 | 8,230 | | | | | | |
| Market, public, fall | 153,970 | 17,250 | | | 5,898 | 550 | | |
| Total | 1,872,081 | 62,658 | 1,225,900 | 9,805 | 25,287,208 | 158,871 | 47,950 | 3,017 |

| Species | Carteret | | Chowan | | Craven | | Currituck | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 37,000 | $420 | 3,172,800 | $28,529 | 127,500 | $836 | 16,900 | $418 |
| Black bass | | | | | | | 89,213 | 12,965 |
| Bluefish | 446,800 | 20,355 | 500 | 40 | 16,350 | 327 | 4,500 | 225 |
| Bonito | 11,000 | 233 | | | | | 1,000 | 30 |
| Bowfin | | | | | | | 13,980 | 403 |
| Butterfish | 32,785 | 1,076 | | | 49,000 | 980 | 1,000 | 50 |
| Carp | | | 4,500 | 210 | | | 352,689 | 26,518 |
| Catfish and bullheads | | | 60,000 | 3,000 | | | 165,572 | 6,979 |
| Cero | 9,000 | 680 | | | | | | |
| Cod | | | 200 | 10 | | | 300 | 15 |
| Croaker | 2,435,750 | 41,374 | 75,000 | 1,400 | 217,810 | 2,178 | 65,000 | 1,300 |
| Drum, red or redfish | 66,050 | 1,108 | | | 1,000 | 10 | 1,000 | 40 |
| Eels | 1,000 | 100 | 3,400 | 292 | 20,000 | 1,400 | 52,110 | 3,769 |
| Flounders | 31,750 | 1,508 | 20,100 | 806 | 14,300 | 419 | 13,250 | 947 |
| Gizzard shad | | | 4,000 | 40 | | | 11,991 | 210 |
| Grunts | 18,000 | 360 | | | | | | |
| Harvestfish | 231,000 | 7,560 | | | | | 1,000 | 30 |
| Hickory shad | 48,200 | 1,570 | 16,400 | 1,200 | 3,500 | 105 | 3,000 | 175 |
| King whiting or "kingfish" | 142,200 | 5,624 | 1,200 | 48 | | | 7,500 | 375 |
| Menhaden | 109,726,040 | 414,287 | | | | | | |
| Mullet | 926,440 | 25,748 | | | 121,100 | 8,432 | 2,800 | 196 |
| Pigfish | 84,700 | 1,437 | | | | | 850 | 11 |
| Pike or pickerel | | | | | | | 7,820 | 868 |
| Pinfish | 31,500 | 473 | | | | | | |
| Pompano | 2,650 | 261 | | | | | 200 | 30 |
| Sea bass | 110,050 | 4,405 | | | | | | |
| Shad | 41,000 | 7,690 | 72,350 | 13,175 | 53,150 | 10,655 | 22,800 | 3,839 |
| Sheepshead | 4,890 | 232 | | | | | 400 | 23 |
| Snapper, red | 2,750 | 155 | | | | | | |
| Spadefish | 380 | 16 | | | | | | |
| Spanish mackerel | 108,165 | 10,124 | | | | | 850 | 85 |
| Spot | 1,392,350 | 22,943 | 5,000 | 100 | 76,000 | 1,270 | 16,000 | 330 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 695,690 | 28,292 | 5,000 | 200 | 91,537 | 2,146 | 18,000 | 960 |
| Spotted | 206,550 | 14,942 | | | 29,809 | 3,577 | 18,000 | 1,640 |
| Squirrelfish | 50 | 1 | | | | | | |
| Striped bass | 17,290 | 1,644 | 19,800 | 3,910 | 16,350 | 2,438 | 61,822 | 11,999 |
| Suckers | | | 8,000 | 380 | | | 500 | 10 |
| Sunfish | | | | | | | 7,597 | 158 |
| White perch | 400 | 20 | 10,500 | 900 | | | 202,448 | 11,590 |
| Yellow perch | | | 3,500 | 280 | 6,000 | 900 | 57,350 | 3,132 |
| Crabs: | | | | | | | | |
| Hard | 13,000 | 250 | | | | | | |
| Soft | 378,580 | 57,068 | | | | | | |
| Shrimp | 799,860 | 25,650 | | | | | | |
| Clams, hard, public | 184,000 | 23,125 | | | | | | |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Carteret | | Chowan | | Craven | | Currituck | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Oysters: | | | | | | | | |
| Market, public, spring | 589,820 | 29,820 | | | | | | |
| Market, public, fall | 379,683 | 26,014 | | | | | | |
| Scallops, bay | 431,826 | 53,923 | | | | | | |
| Octopus | 1,000 | 150 | | | | | | |
| Terrapin, diamond-back | 90 | 45 | | | | | | |
| Turtles, loggerhead | | | | | | | 70 | $2 |
| Total | 119,639,289 | 830,683 | $3,482,250 | $54,520 | 843,406 | $35,673 | 1,217,512 | 89,382 |

| Species | Dare | | Gates | | Hertford | | Hyde | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 206,400 | $3,278 | 40,000 | $600 | 103,000 | $575 | 58,000 | $950 |
| Black bass | 13,500 | 2,025 | | | | | | |
| Bluefish | 194,685 | 11,979 | | | | | 127,400 | 5,096 |
| Bonito | 6,850 | 207 | | | | | | |
| Bowfin | 1,300 | 26 | 500 | 10 | | | | |
| Butterfish | 23,775 | 660 | | | | | 54,500 | 1,105 |
| Carp | 47,150 | 2,016 | 300 | 15 | | | 1,000 | 20 |
| Catfish and bullheads | 47,000 | 1,810 | 6,200 | 260 | | | | |
| Cod | 700 | 20 | | | | | | |
| Crappie | | | 400 | 60 | | | | |
| Croaker | 460,550 | 7,802 | | | | | 599,000 | 5,830 |
| Drum, red or redfish | 22,100 | 494 | | | | | 42,000 | 610 |
| Eels | 9,100 | 690 | 200 | 16 | | | 1,000 | 100 |
| Flounders | 79,800 | 3,984 | | | | | 2,500 | 125 |
| Garfish | 100 | 6 | | | | | | |
| Gizzard shad | 2,500 | 45 | | | | | | |
| Harvestfish | 38,700 | 1,049 | | | | | 72,600 | 1,472 |
| Hickory shad | 132,500 | 6,105 | 1,000 | 60 | | | 17,750 | 425 |
| King whiting or "kingfish" | 43,950 | 1,476 | | | | | 6,400 | 320 |
| Mullet | 79,200 | 3,246 | | | | | 196,500 | 6,000 |
| Pigfish | 3,650 | 68 | | | | | | |
| Pike or pickerel | 1,200 | 174 | | | | | | |
| Pinfish | 400 | 7 | | | | | | |
| Pompano | 5,650 | 606 | | | | | | |
| Shad | 578,400 | 95,498 | 4,950 | 800 | 500 | 75 | 10,700 | 1,840 |
| Sheepshead | 1,350 | 72 | | | | | 3,225 | 161 |
| Spadefish | 50 | 1 | | | | | | |
| Spanish mackerel | 8,050 | 791 | | | | | 8,100 | 476 |
| Spot | 219,240 | 3,807 | | | | | 161,200 | 3,224 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 746,450 | 27,085 | | | | | 355,250 | 11,735 |
| Spotted | 346,050 | 29,157 | | | | | 43,100 | 3,550 |
| Squirrelfish | 100 | 5 | | | | | | |
| Striped bass | 136,200 | 19,705 | 400 | 74 | | | 2,200 | 80 |
| Sturgeon | 700 | 140 | | | | | 400 | 100 |
| Suckers | | | 200 | 8 | | | | |
| Sunfish | 1,200 | 27 | | | | | | |
| Tripletail | 500 | 19 | | | | | | |
| White perch | 26,750 | 1,365 | 2,500 | 260 | 1,000 | 100 | | |
| Yellow perch | 6,350 | 3,222 | 200 | 16 | | | | |
| Crabs, hard | 50,000 | 800 | | | | | 13,300 | 133 |
| Clams, hard, public | 1,600 | 400 | | | | | 800 | 100 |
| Oysters: | | | | | | | | |
| Market, public, spring | 179,856 | 9,625 | | | | | 70,526 | 6,672 |
| Market, public, fall | 33,244 | 2,800 | | | | | 65,550 | 6,208 |
| Turtles, snapper | | | | | | | 300 | 15 |
| Total | 3,756,850 | 239,392 | 56,850 | 2,179 | 104,500 | 750 | 1,913,301 | 56,347 |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Lenoir | | Martin | | New Hanover | | Onslow | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 214,000 | $1,220 | | | | |
| Carp | 1,000 | $50 | 16,000 | 800 | | | | |
| Catfish and bullheads | 1,000 | 100 | 13,500 | 405 | 10,000 | $300 | | |
| Crappie | 250 | 50 | | | | | | |
| Croaker | | | | | 2,100 | 42 | 12,000 | $130 |
| Drum, red or redfish | | | | | 600 | 24 | | |
| Eels | 500 | 25 | 15,000 | 750 | | | | |
| Flounders | | | | | 4,500 | 225 | 7,000 | 490 |
| Hickory shad | 3,000 | 150 | | | | | | |
| King whiting or "kingfish" | | | | | 1,000 | 100 | 30,000 | 1,800 |
| Mullet | | | | | 330,000 | 16,500 | 169,000 | 6,305 |
| Porgies | | | | | 1,000 | 30 | | |
| Sea bass | | | | | 40,000 | 2,400 | 6,000 | 310 |
| Shad | 2,000 | 400 | 1,500 | 300 | 48,000 | 9,600 | | |
| Snapper, red | | | | | | | 2,000 | 40 |
| Spanish mackerel | | | | | 6,000 | 300 | | |
| Spot | | | | | 143,000 | 2,860 | 15,000 | 175 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 2,500 | 85 |
| Spotted | | | | | 1,000 | 100 | 8,500 | 1,025 |
| Striped bass | 4,000 | 1,000 | 6,000 | 825 | | | | |
| Sturgeon | | | | | 1,500 | 600 | | |
| Suckers | 700 | 70 | | | | | | |
| White perch | | | 2,000 | 200 | | | | |
| Yellow perch | 1,000 | 225 | | | | | | |
| Crabs, stone | | | | | | | 350 | 11 |
| Shrimp | | | | | 43,250 | 1,297 | | |
| Clams, hard, public | | | | | 56,000 | 8,750 | 12,000 | 1,125 |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | | | 16,086 | 1,000 |
| Market, public, fall | | | | | | | 16,086 | 1,000 |
| Total | 13,450 | 2,070 | 268,000 | 4,500 | 687,950 | 43,128 | 296,522 | 13,496 |

| Species | Pamlico | | Pasquotank | | Pender | | Perquimans | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 75,000 | $668 | 101,500 | $1,580 | | | 180,000 | $1,600 |
| Black bass | | | 1,200 | 180 | | | | |
| Bluefish | 900 | 43 | 1,800 | 216 | | | | |
| Bowfin | | | 1,250 | 15 | | | 1,000 | 30 |
| Butterfish | 6,500 | 130 | | | | | | |
| Carp | 700 | 13 | 3,150 | 237 | | | 5,500 | 275 |
| Catfish and bullheads | | | 64,800 | 2,695 | | | 33,000 | 1,900 |
| Croaker | 752,000 | 8,530 | 265,100 | 4,453 | 5,000 | $150 | | |
| Drum, red or redfish | 10,500 | 80 | | | | | | |
| Eels | 5,000 | 400 | 4,750 | 330 | | | 15,100 | 1,510 |
| Flounders | 27,200 | 1,193 | 62,700 | 3,157 | 5,000 | 250 | 2,100 | 90 |
| Gizzard shad | | | 15,000 | 258 | | | 5,000 | 53 |
| Hickory shad | 14,500 | 485 | 10,000 | 530 | | | 17,500 | 1,360 |
| King whiting or "kingfish" | | | 14,000 | 560 | | | | |
| Mullet | 100,400 | 8,030 | 2,700 | 216 | 185,000 | 5,975 | 1,500 | 120 |
| Pigfish | 4,500 | 65 | | | | | | |
| Pike or pickerel | | | 700 | 70 | | | | |
| Shad | 73,000 | 14,800 | 61,300 | 10,257 | | | 85,000 | 16,885 |
| Sheepshead | 1,300 | 64 | | | | | | |
| Spot | 148,000 | 1,680 | | | 125,000 | 1,435 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 314,000 | 8,875 | 4,700 | 235 | | | | |
| Spotted | 25,000 | 2,650 | | | | | | |
| Striped bass | 1,100 | 43 | 25,000 | 4,800 | | | 60,000 | 9,000 |
| Suckers | | | 450 | 15 | | | 5,800 | 241 |
| White perch | | | 18,700 | 1,586 | | | 52,000 | 5,200 |
| Yellow perch | | | 4,300 | 226 | | | 500 | 50 |
| Crabs, hard | 322,000 | 9,030 | | | | | | |
| Shrimp | | | | | 2,000 | 500 | | |
| Clams, hard, public | | | | | 41,520 | 4,080 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 208,245 | 15,278 | 15,014 | 2,100 | | | | |
| Market, public, fall | 376,942 | 27,521 | 8,043 | 1,080 | | | | |
| Total | 2,466,787 | 99,578 | 686,157 | 34,796 | 363,520 | 12,390 | 464,000 | 38,374 |

*Fisheries of North Carolina, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Pitt | | Tyrrell | | Washington | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 70,000 | $350 | 1,798,400 | $8,992 | 2,043,227 | $10,213 |
| Carp | 1,000 | 50 | 10,000 | 1,000 | | |
| Catfish and bullheads | | | 28,700 | 1,435 | 10,000 | 500 |
| Eels | | | 4,500 | 360 | | |
| Flounders | | | 7,500 | 750 | | |
| Hickory shad | 1,200 | 36 | | | 38,210 | 1,150 |
| Shad | 2,250 | 461 | 13,400 | 2,680 | 19,611 | 3,222 |
| Striped bass | | | 12,100 | 1,855 | 80,814 | 1,397 |
| White perch | 1,000 | 100 | 12,800 | 1,280 | 78,910 | 7,891 |
| Yellow perch | | | 11,400 | 1,140 | | |
| Turtles, snapper | | | | | 200 | 10 |
| Total | 75,450 | 997 | 1,898,800 | 19,492 | 2,270,972 | 24,383 |

*Industries related to the fisheries of North Carolina, 1930*

TRANSPORTING

| Item | Beaufort County | Bertie County | Carteret County | Craven County | Dare County | Hyde County | Pasquotank County | Washington County | Total |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged: | | | | | | | | | |
| On vessels | 13 | | 20 | 3 | 8 | 2 | 6 | 2 | 54 |
| On boats | | 1 | | 4 | | | | | 5 |
| Total | 13 | 1 | 20 | 7 | 8 | 2 | 6 | 2 | 59 |
| Vessels, motor: | | | | | | | | | |
| 5 to 10 tons | 4 | | 14 | 2 | 1 | | | 1 | 22 |
| 11 to 20 tons | 2 | | 2 | 1 | 3 | 1 | 1 | | 10 |
| 21 to 30 tons | | | | | | | 1 | | 1 |
| Total | 6 | | 16 | 3 | 4 | 1 | 2 | 1 | 33 |
| Net tonnage | 61 | | 117 | 25 | 43 | 16 | 47 | 6 | 315 |
| Boats | | 1 | | 2 | | | | | 3 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Beaufort County | Brunswick County | Carteret County | Craven and Pamlico Counties | New Hanover Counties | Washington, Pasquotank, and Bertie Counties | Total |
|---|---|---|---|---|---|---|---|
| Establishments | 10 | 3 | 36 | 11 | 5 | 6 | 71 |
| Persons engaged: | | | | | | | |
| Proprietors | 11 | 4 | 47 | 13 | 5 | 10 | 90 |
| Salaried employees | 1 | 3 | 18 | 1 | | 3 | 26 |
| Wage earners— | | | | | | | |
| Average for season | 159 | 134 | 323 | 213 | 3 | 220 | 1,052 |
| Average for year | 66 | 22 | 127 | 59 | | 31 | 305 |
| Paid to salaried employees | $4,080 | $5,595 | $25,010 | $500 | | $13,577 | $48,762 |
| Paid to wage earners | 28,335 | 15,952 | 93,443 | 28,014 | $1,150 | 18,268 | 185,162 |
| Total salaries and wages | 32,415 | 21,547 | 118,453 | 28,514 | 1,150 | 31,845 | 233,924 |

*Industries related to the fisheries of North Carolina, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Alewives, salted | pounds | 795,000 | $24,500 |
| Menhaden products: | | | |
| Acid scrap | tons | 3,379 | 83,414 |
| Dry scrap | do | 2,894 | 133,149 |
| Meal | do | 1,457 | 76,909 |
| Oil | gallons | 308,472 | 51,877 |
| Mullet, salted | pounds | 666,660 | 42,109 |
| Spot, salted | do | 172,000 | 10,220 |
| Oysters: | | | |
| Fresh-shucked | gallons | 112,539 | 140,465 |
| Canned | standard cases | 9,945 | 49,529 |
| Miscellaneous [1] | | (2) | 224,579 |
| Total | | | 836,751 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 417]

| | | | |
|---|---|---|---|
| Alewives: | | | |
| Salted | pounds | 2,245,800 | $38,971 |
| Corned | do | 1,505,800 | 27,280 |
| Mullet, salted | do | 143,200 | 10,828 |
| Sturgeon roe, fresh | do | 140 | 140 |
| Scallops, bay, fresh-shucked | gallons | 47,000 | 53,000 |
| Total | | | 130,219 |

[1] Includes fresh-cooked crab meat; cooked and canned shrimp; pickled alewives; fresh fillets of butterfish, croaker, and squeteague; canned alewife roe; and oyster-shell products.

[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 1 has also been included as a fisherman, and among the total persons engaged in the preparation of fishermen's manufactured products, 344 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries, exclusive of duplication.

## SOUTH CAROLINA

*Fisheries of South Carolina, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | | Lines | | Dip nets, common |
|---|---|---|---|---|---|---|---|
| | | Anchor | Drift | Run-around | Hand | Trot, with baits or snoods | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | | | | | 21 | | |
| On boats and shore— | | | | | | | |
| Regular | 18 | 40 | 50 | 27 | 91 | 6 | 10 |
| Casual | 288 | 191 | 230 | | 15 | | |
| Total | 306 | 231 | 280 | 27 | 127 | 6 | 10 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | | | | | 2 | | |
| 11 to 20 tons | | | | | 1 | | |
| Total vessels | | | | | 3 | | |
| Total net tonnage | | | | | 29 | | |
| Boats: | | | | | | | |
| Motor | 3 | 1 | 10 | | 9 | | |
| Other | 79 | 201 | 172 | 27 | 40 | | 10 |
| Apparatus: | | | | | | | |
| Number | 21 | 282 | 157 | 27 | 127 | 6 | 10 |
| Length, yards | 3,535 | | | | | | |
| Square yards | | 82,000 | 160,790 | 13,000 | 460 | 4,800 | |
| Hooks, baits, or snoods | | | | | | | |

*Fisheries of South Carolina, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Otter trawls, shrimp | Spears | Dredges, oyster | Tongs | Rakes | Grabs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 19 | | 6 | | | | | 39 |
| On boats and shore— | | | | | | | | |
| Regular | 52 | 30 | | 27 | 15 | 451 | 40 | 705 |
| Casual | 6 | | | 50 | 32 | 50 | 9 | 756 |
| Total | 77 | 30 | 6 | 77 | 47 | 501 | 49 | 1,500 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | 3 | | | | | | | 5 |
| 11 to 20 tons | 4 | | 1 | | | | | 5 |
| Total vessels | 7 | | 1 | | | | | 10 |
| Total net tonnage | 88 | | 19 | | | | | 124 |
| Boats: | | | | | | | | |
| Motor | 29 | | | | | | | 51 |
| Other | | 30 | | 45 | 31 | 477 | 7 | 969 |
| Apparatus: | | | | | | | | |
| Number | 36 | 30 | 2 | 77 | 47 | 501 | | |
| Yards at mouth | 675 | | 3 | | | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Drift | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | 2,000 | $10 | | |
| Croaker | 1,000 | $10 | | | | | | |
| Drum, red or redfish | 7,350 | 377 | | | | | | |
| Flounders | 2,000 | 100 | | | | | 725 | $36 |
| Hickory shad | | | 3,250 | $145 | 4,250 | 185 | | |
| King whiting or "kingfish" | 3,080 | 201 | | | | | | |
| Mullet | 358,000 | 18,272 | | | | | 54,000 | 2,700 |
| Shad | | | 89,857 | 15,428 | 122,310 | 16,589 | | |
| Spot | 11,200 | 324 | | | | | 17,000 | 340 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 2,000 | 100 | | | | | | |
| Spotted | 7,400 | 740 | | | | | 2,300 | 230 |
| Sturgeon | | | 8,464 | 1,693 | 6,500 | 1,300 | | |
| Terrapin, diamond-back | 1,619 | 598 | | | | | | |
| Total | 393,649 | 20,722 | 101,571 | 17,266 | 135,060 | 18,084 | 74,025 | 3,306 |

*Fisheries of South Carolina, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | Dip nets, common | | Otter trawls, shrimp | | Spears | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hand | | Trot, with baits or snoods | | | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 100 | $10 | | | | | | | | |
| Catfish and bullheads | 2,000 | 40 | | | | | | | | |
| Croaker | 1,000 | 50 | | | | | | | | |
| Drum: | | | | | | | | | | |
| Black | 500 | 25 | | | | | | | | |
| Red or redfish | 1,000 | 89 | | | | | | | | |
| Flounders | 300 | 30 | | | | | 2,000 | $100 | 25,000 | $2,000 |
| Grunts | 8,000 | 640 | | | | | | | | |
| King whiting or "kingfish" | 30,000 | 3,000 | | | | | 5,000 | 250 | | |
| Pigfish | 725 | 22 | | | | | | | | |
| Pinfish | 2,000 | 80 | | | | | | | | |
| Pompano | 100 | 15 | | | | | | | | |
| Porgies | 100 | 8 | | | | | | | | |
| Sea bass | 197,250 | 15,587 | | | | | | | | |
| Shad | | | | | 2,325 | $348 | | | | |
| Sharks | 10,000 | 200 | | | | | | | | |
| Sheepshead | 100 | 10 | | | | | | | | |
| Skates | 1,000 | 50 | | | | | | | | |
| Snapper, mangrove | 3,000 | 240 | | | | | | | | |
| Spot | 100 | 5 | | | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | 20,000 | 1,600 | | | | | 2,000 | 20 | | |
| Spotted | 1,200 | 120 | | | | | | | | |
| Squirrelfish | 350 | 18 | | | | | | | | |
| Crabs, hard | | | 26,000 | $780 | | | 792,733 | 31,814 | | |
| Shrimp | | | | | | | | | | |
| Octopus | 3,500 | 290 | | | | | | | | |
| Total | 282,325 | 22,129 | 26,000 | 780 | 2,325 | 348 | 801,733 | 32,184 | 25,000 | 2,000 |

| Species | Dredges, oyster | | Tongs | | Rakes | | Grabs | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams, hard, public | | | | | 11,200 | $1,400 | | | | |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | | | 1,738,968 | $58,387 | 3,089 | $500 |
| Market, public, fall | | | 9,221 | $750 | 6,915 | 450 | 661,370 | 23,714 | 6,454 | 1,000 |
| Market, private, spring | 115,255 | $10,000 | 43,566 | 2,363 | | | 387,257 | 21,000 | | |
| Market, private, fall | | | 22,853 | 1,238 | | | 253,561 | 13,750 | | |
| Terrapin, diamondback | | | | | | | | | 4,200 | 1,488 |
| Total | 115,255 | 10,000 | 75,640 | 4,351 | 18,115 | 1,850 | 3,041,156 | 116,851 | 13,743 | 2,988 |

OPERATING UNITS: BY COUNTIES

| Item | Beaufort | Charleston | Colleton | Georgetown | Horry |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | |
| On vessels | | 39 | | | |
| On boats and shore— | | | | | |
| Regular | 326 | 256 | | 100 | 23 |
| Casual | 74 | 143 | 129 | 230 | 180 |
| Total | 400 | 438 | 129 | 330 | 203 |
| Vessels, motor: | | | | | |
| 5 to 10 tons | | 5 | | | |
| 11 to 20 tons | | 5 | | | |
| Total vessels | | 10 | | | |
| Total net tonnage | | 124 | | | |

*Fisheries of South Carolina, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Beaufort | Charleston | Colleton | Georgetown | Horry |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Boats: | | | | | |
| Motor | | 35 | 1 | 12 | 3 |
| Other | 372 | 230 | 109 | 188 | 70 |
| Apparatus: | | | | | |
| Haul seines | 2 | 2 | | 4 | 13 |
| Length, yards | 135 | 100 | | 800 | 2,500 |
| Gill nets— | | | | | |
| Anchor | 60 | 40 | 142 | 40 | |
| Square yards | 12,000 | 16,000 | 35,400 | 18,600 | |
| Drift | 20 | 17 | 20 | 100 | |
| Square yards | 10,000 | 24,100 | 24,000 | 102,690 | |
| Runaround | | | | 27 | |
| Square yards | | | | 13,000 | |
| Lines— | | | | | |
| Hand | | 92 | | 20 | 15 |
| Hooks | | 360 | | 40 | 60 |
| Trot, with baits or snoods | | 6 | | | |
| Baits or snoods | | 4,800 | | | |
| Dip nets, common | | | | | 10 |
| Otter trawls, shrimp | | 35 | | 1 | |
| Yards at mouth | | 655 | | 20 | |
| Spears | | | | 30 | |
| Dredges, oyster | | 2 | | | |
| Yards at mouth | | 3 | | | |
| Tongs | 10 | 17 | | | 50 |
| Rakes | | | | 15 | 32 |
| Grabs | 316 | 185 | | | |

CATCH: BY COUNTIES

| Species | Beaufort | | Charleston | | Colleton | | Georgetown | | Horry | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | | | | | 2,000 | $10 | | |
| Bluefish | | | 100 | $10 | | | | | | |
| Catfish and bullheads | | | 2,000 | 40 | | | | | | |
| Croaker | | | 1,000 | 50 | | | 1,000 | 10 | | |
| Drum: | | | | | | | | | | |
| Black | | | 500 | 25 | | | | | | |
| Red or redfish | | | 1,000 | 89 | | | 3,250 | 162 | 4,100 | $215 |
| Flounders | | | 2,300 | 130 | | | 26,025 | 2,051 | 1,700 | 85 |
| Grunts | | | 8,000 | 640 | | | | | | |
| Hickory shad | 500 | $50 | | | | | 7,000 | 280 | | |
| King whiting or "kingfish" | | | 35,000 | 3,250 | | | 450 | 27 | 2,630 | 174 |
| Mullet | | | | | | | 104,000 | 5,200 | 308,000 | 15,772 |
| Pigfish | | | | | | | | | 725 | 22 |
| Pinfish | | | | | | | 1,000 | 50 | 1,000 | 30 |
| Pompano | | | 100 | 15 | | | | | | |
| Porgies | | | 100 | 8 | | | | | | |
| Sea bass | | | 182,000 | 14,560 | | | 4,000 | 240 | 11,250 | 787 |
| Shad | 13,927 | 2,785 | 20,750 | 3,882 | 54,700 | $9,965 | 122,790 | 15,385 | 2,325 | 348 |
| Sharks | | | 10,000 | 200 | | | | | | |
| Sheepshead | | | 100 | 10 | | | | | | |
| Skates | | | 1,000 | 50 | | | | | | |
| Snapper, mangrove | | | 3,000 | 240 | | | | | | |
| Spot | | | 100 | 5 | | | 18,200 | 364 | 10,000 | 300 |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | | | 22,000 | 1,620 | | | | | 2,000 | 100 |
| Spotted | | | | | | | 4,800 | 480 | 6,100 | 610 |
| Squirrelfish | | | 350 | 18 | | | | | | |
| Sturgeon | | | | | 8,464 | 1,693 | 6,500 | 1,300 | | |
| Crabs, hard | | | 26,000 | 780 | | | | | | |
| Shrimp | | | 780,233 | 31,189 | | | 12,500 | 625 | | |
| Clams, hard, public | | | | | | | 4,800 | 600 | 6,400 | 800 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | 1,157,797 | 38,835 | 584,260 | 20,052 | | | | | | |
| Market, public, fall | 564,095 | 20,514 | 103,730 | 4,200 | | | 6,915 | 450 | 9,220 | 750 |
| Market, private, spring | 15,905 | 863 | 530,173 | 32,500 | | | | | | |
| Market, private, fall | 22,853 | 1,238 | 253,561 | 13,750 | | | | | | |
| Octopus | | | 3,500 | 290 | | | | | | |
| Terrapin, diamond-back | 4,019 | 1,411 | 1,800 | 675 | | | | | | |
| Total | 1,779,096 | 65,696 | 2,572,657 | 128,278 | 63,164 | 11,658 | 325,230 | 27,234 | 365,450 | 19,993 |

*Industries related to the fisheries of South Carolina, 1930*

TRANSPORTING

| Item | Beaufort County | Charleston County | Total |
|---|---|---|---|
| Persons engaged: | *Number* | *Number* | *Number* |
| On vessels | 78 | 28 | 106 |
| On boats | 7 | | 7 |
| Total | 85 | 28 | 113 |
| Vessels: | | | |
| Motor— | | | |
| 5 to 10 tons | | 7 | 7 |
| 11 to 20 tons | 1 | 5 | 6 |
| Total | 1 | 12 | 13 |
| Net tonnage | 13 | 125 | 138 |
| Sail— | | | |
| 5 to 10 tons | 26 | 3 | 29 |
| 11 to 20 tons | 9 | 1 | 10 |
| 21 to 30 tons | 1 | | 1 |
| Total | 36 | 4 | 40 |
| Net tonnage | 330 | 38 | 368 |
| Total vessels | 37 | 16 | 53 |
| Total net tonnage | 343 | 163 | 506 |
| Boats | 28 | 5 | 33 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Beaufort County | Charleston County | Georgetown County | Total |
|---|---|---|---|---|
| Establishments | 17 | 12 | 3 | 32 |
| Persons engaged: | | | | |
| Proprietors | 18 | 12 | 3 | 33 |
| Salaried employees | 8 | 13 | 3 | 24 |
| Wage earners— | | | | |
| Average for season | 833 | 460 | 34 | 1,327 |
| Average for year | 286 | 191 | 14 | 491 |
| Paid to salaried employees | $26,271 | $42,248 | $1,405 | $69,924 |
| Paid to wage earners | 95,908 | 80,276 | 13,290 | 189,474 |
| Total salaries and wages | 122,179 | 122,524 | 14,695 | 259,398 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Shrimp, canned | standard cases | 40,108 | $245,688 |
| Oysters: | | | |
| Fresh-shucked | gallons | 32,943 | 38,750 |
| Canned | standard cases | 93,288 | 408,465 |
| Miscellaneous [1] | | (2) | 189,635 |
| Total | | | 882,538 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 37]

| | | | |
|---|---|---|---|
| Mullet, salted | pounds | 360,000 | $28,800 |
| Sturgeon roe, salted | do | 182 | 137 |
| Total | | 360,182 | 28,937 |

[1] Includes menhaden and oyster-shell products. [2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 74 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 37 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## GEORGIA

*Fisheries of Georgia, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines, menhaden | Haul seines | Gill nets | | | | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | Drift | Run-around | Stake | Hand | Trot, with baits or snoods |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 90 | | | | | | 8 | |
| On boats and shore— | | | | | | | | |
| Regular | | 28 | | 12 | 34 | 2 | | 6 |
| Casual | | 32 | 22 | 265 | 11 | 53 | | |
| Total | 90 | 60 | 22 | 277 | 45 | 55 | 8 | 6 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 41 to 50 tons | 1 | | | | | | | |
| 51 to 60 tons | 1 | | | | | | | |
| 61 to 70 tons | 1 | | | | | | | |
| Total | 3 | | | | | | | |
| Net tonnage | 166 | | | | | | | |
| Motor— | | | | | | | | |
| 11 to 20 tons | | | | | | | 1 | |
| Net tonnage | | | | | | | 14 | |
| Total vessels | 3 | | | | | | 1 | |
| Total net tonnage | 166 | | | | | | 14 | |
| Boats: | | | | | | | | |
| Motor | | | | 6 | 13 | 1 | | |
| Other | | 24 | 19 | 140 | 32 | 42 | | 6 |
| Accessory boats | 9 | | | | | | 3 | |
| Apparatus: | | | | | | | | |
| Number | 3 | 16 | 27 | 146 | 45 | 105 | 8 | 6 |
| Length, yards | 900 | 1,850 | | | | | | |
| Square yards | | | 6,090 | 275,045 | 14,310 | 54,540 | | |
| Hooks, baits, or snoods | | | | | | | 16 | 1,950 |

| Item | Lines, trot, with hooks | Fyke nets | Cast nets | Otter trawls, shrimp | Traps, crab | Tongs | Rakes | Grabs | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | | | 46 | | | | | 144 |
| On boats and shore— | | | | | | | | | |
| Regular | | | 22 | 288 | 30 | 62 | | 34 | 371 |
| Casual | 68 | 30 | 18 | 15 | | 46 | 6 | 50 | 472 |
| Total | 68 | 30 | 40 | 349 | 30 | 108 | 6 | 84 | 987 |
| Vessels: | | | | | | | | | |
| Steam— | | | | | | | | | |
| 41 to 50 tons | | | | | | | | | 1 |
| 51 to 60 tons | | | | | | | | | 1 |
| 61 to 70 tons | | | | | | | | | 1 |
| Total | | | | | | | | | 3 |
| Net tonnage | | | | | | | | | 166 |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | | | 21 | | | | | 21 |
| 11 to 20 tons | | | | 2 | | | | | 3 |
| Total | | | | 23 | | | | | 24 |
| Net tonnage | | | | 181 | | | | | 195 |
| Total vessels | | | | 23 | | | | | 27 |
| Total net tonnage | | | | 181 | | | | | 361 |
| Boats: | | | | | | | | | |
| Motor | | | | 175 | | | | | 178 |
| Other | 18 | 10 | 40 | | 30 | 108 | 6 | 64 | 421 |
| Accessory boats | | | | | | | | | 12 |
| Apparatus: | | | | | | | | | |
| Number | 68 | 60 | 40 | 182 | 30 | 108 | 6 | 84 | |
| Yards at mouth | | | | 3,774 | | | | | |
| Hooks, baits, or snoods | 3,400 | | | | | | | | |

*Fisheries of Georgia, 1930*—Continued

CATCH: BY GEAR

| Species | Purse seines, menhaden | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor | | Drift | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Croaker | | | 1,000 | $20 | | | | |
| Flounders | | | 300 | 24 | | | | |
| Hickory shad | | | | | 2,600 | $208 | 15,700 | $1,226 |
| Menhaden | 24,701,250 | $94,100 | | | | | | |
| Mullet | | | 30,000 | 1,500 | | | 5,000 | 250 |
| Shad | | | | | 15,800 | 3,160 | 223,705 | 44,541 |
| Spot | | | 1,200 | 24 | | | | |
| Squeteagues or "sea trout", spotted | | | 1,300 | 130 | | | | |
| Sturgeon | | | | | | | 4,500 | 900 |
| Terrapin, diamond-back | | | 19,700 | 5,040 | | | | |
| Total | 24,701,250 | 94,100 | 53,500 | 6,738 | 18,400 | 3,368 | 248,905 | 46,917 |

| Species | Gill nets—Continued | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Runaround | | Stake | | Hand | | Trot, with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | 1,012 | $227 | | |
| Croaker | 14,500 | $290 | | | | | | |
| Drum: | | | | | | | | |
| Black | 1,000 | 30 | | | | | | |
| Red or redfish | 5,250 | 210 | | | | | | |
| Flounders | 5,300 | 365 | | | | | | |
| Groupers | | | | | 7,354 | 441 | | |
| Grunts | | | | | 390 | 32 | | |
| Hickory shad | | | 7,200 | $576 | | | | |
| Jewfish | | | | | 4,629 | 232 | | |
| King whiting or "kingfish" | 16,250 | 363 | | | | | | |
| Mullet | 72,800 | 4,245 | | | | | | |
| Sea bass | 2,000 | 80 | | | 20,840 | 2,005 | | |
| Shad | | | 35,250 | 7,050 | | | | |
| Sheepshead | 700 | 42 | | | | | | |
| Snapper: | | | | | | | | |
| Mangrove | | | | | 200 | 16 | | |
| Red | | | | | 29,854 | 2,462 | | |
| Spot | 3,750 | 55 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 3,000 | 130 | | | | | | |
| Spotted | 47,150 | 3,762 | | | | | | |
| Striped bass | | | 500 | 100 | | | | |
| Crabs, hard | | | | | | | 154,000 | $3,080 |
| Total | 171,700 | 9,572 | 42,950 | 7,726 | 64,279 | 5,415 | 154,000 | 3,080 |

| Species | Lines—Trot, with hooks | | Fyke nets | | Cast nets | | Otter trawls, shrimp | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 16,000 | $740 | 212,000 | $6,360 | | | | |
| Flounders | | | | | | | 3,200 | $224 |
| King whiting or "kingfish" | | | | | | | 22,000 | 1,100 |
| Mullet | | | | | 69,000 | $3,800 | | |
| Spot | | | | | | | 7,000 | 140 |
| Crabs, hard | | | | | | | 7,000 | 140 |
| Shrimp | | | | | | | 8,852,712 | 334,576 |
| Total | 16,000 | 740 | 212,000 | 6,360 | 69,000 | 3,800 | 8,891,912 | 336,180 |

*Fisheries of Georgia, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Pots, crab | | Tongs | | Rakes | | Crabs | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, hard | 67,000 | $1,340 | | | | | | |
| Clams, hard, public | | | | | 2,240 | $350 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 29,978 | $2,740 | | | | |
| Market, public, fall | | | 21,161 | 1,440 | | | | |
| Market, private, spring | | | 18,957 | 2,060 | | | 31,752 | $1,363 |
| Market, private, fall | | | 18,975 | 1,356 | | | 38,562 | 1,649 |
| Total | 67,000 | 1,340 | 89,071 | 7,596 | 2,240 | 350 | 70,314 | 3,012 |

OPERATING UNITS: BY COUNTIES

| Item | Bryan | Bullock | Camden | Charleston | Chatham | Glynn |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 94 | | 24 | 24 |
| On boats and shore— | | | | | | |
| Regular | | | 50 | | 68 | 180 |
| Casual | 55 | 16 | 44 | 18 | 212 | 56 |
| Total | 55 | 16 | 188 | 18 | 304 | 260 |
| Vessels: | | | | | | |
| Steam— | | | | | | |
| 41 to 50 tons | | | 1 | | | |
| 51 to 60 tons | | | 1 | | | |
| 61 to 70 tons | | | 1 | | | |
| Total | | | 3 | | | |
| Net tonnage | | | 166 | | | |
| Motor— | | | | | | |
| 5 to 10 tons | | | 2 | | 7 | 11 |
| 11 to 20 tons | | | | | 2 | 1 |
| Total | | | 2 | | 9 | 12 |
| Net tonnage | | | 18 | | 79 | 88 |
| Total vessels | | | 5 | | 9 | 12 |
| Total net tonnage | | | 184 | | 79 | 88 |
| Boats: | | | | | | |
| Motor | | | 27 | | 62 | 68 |
| Other | 29 | 8 | 20 | 9 | 165 | 102 |
| Accessory boats | | | 9 | | 3 | |
| Apparatus: | | | | | | |
| Purse seines, menhaden | | | 3 | | | |
| Length, yards | | | 900 | | | |
| Haul seines | | | | | 4 | 12 |
| Length, yards | | | | | 300 | 1,550 |
| Gill nets— | | | | | | |
| Anchor | 5 | | | | | 13 |
| Square yards | 1,900 | | | | | 1,610 |
| Drift | 26 | 8 | 22 | 9 | 31 | 25 |
| Square yards | 83,200 | 3,056 | | 2,700 | 162,505 | 8,100 |
| Runaround | | | | | 20 | 22 |
| Square yards | | | | | 4,390 | 9,170 |
| Stake | | | | | 75 | |
| Square yards | | | | | 49,080 | |
| Lines— | | | | | | |
| Hand | | | | | 8 | |
| Hooks | | | | | 16 | |
| Trot, with baits or snoods | | | | | | 6 |
| Baits or snoods | | | | | | 1,950 |
| Trot, with hooks | | | | | 68 | |
| Hooks | | | | | 3,400 | |
| Cast nets | | | | | 20 | 20 |
| Otter trawls, shrimp | | | 27 | | 54 | 80 |
| Yards at mouth | | | 540 | | 1,080 | 1,736 |
| Pots, crab | | | | | | 30 |
| Tongs | | | | | 46 | 20 |
| Rakes | | | | | 6 | |
| Grabs | | | | | 84 | |

*Fisheries of Georgia, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Liberty | Long | McIntosh | Screven | Tattnall | Wayne |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | | | 2 | | | |
| On boats and shore— | | | | | | |
| Regular | 22 | | 51 | | | |
| Casual | | 6 | 30 | 3 | 20 | 12 |
| Total | 22 | 6 | 83 | 3 | 20 | 12 |
| Vessels: | | | | | | |
| Motor— | | | | | | |
| 5 to 10 tons | | | 1 | | | |
| Total net tonnage | | | 10 | | | |
| Boats: | | | | | | |
| Motor | 1 | | 19 | | 1 | |
| Other | 20 | 3 | 32 | 3 | 18 | 12 |
| Apparatus: | | | | | | |
| Gill nets— | | | | | | |
| Anchor | | 6 | | 3 | | |
| Square yards | | 1,180 | | 1,400 | | |
| Drift | | | 13 | | | 12 |
| Square yards | | | 13,300 | | | 2,184 |
| Runaround | | | 3 | | | |
| Square yards | | | 750 | | | |
| Stake | | | | | 30 | |
| Square yards | | | | | 5,460 | |
| Fyke nets | | | 60 | | | |
| Otter trawls, shrimp | 1 | | 20 | | | |
| Yards at mouth | 18 | | 400 | | | |
| Tongs | 20 | | 22 | | | |

CATCH: BY COUNTIES

| Species | Bryan | | Bullock | | Camden | | Charlton | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Hickory shad | 2,900 | $232 | 700 | $56 | 1,200 | $96 | | |
| Menhaden | | | | | 24,701,250 | 94,100 | | |
| Shad | 43,400 | 8,680 | 2,800 | 360 | 18,500 | 3,700 | 12,300 | $2,460 |
| Shrimp | | | | | 1,052,000 | 41,980 | | |
| Total | 46,300 | 8,912 | 3,500 | 416 | 25,772,950 | 139,876 | 12,300 | 2,460 |

| Species | Chatham | | Glynn | | Liberty | | Long | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bluefish | 1,012 | $227 | | | | | | |
| Catfish and bullheads | 16,000 | 740 | | | | | | |
| Croaker | 3,200 | 64 | 12,300 | $246 | | | | |
| Drum: | | | | | | | | |
| Black | | | 1,000 | 30 | | | | |
| Red or redfish | | | 5,250 | 210 | | | | |
| Flounders | 300 | 15 | 8,500 | 598 | | | | |
| Groupers | 7,354 | 441 | | | | | | |
| Grunts | 390 | 32 | | | | | | |
| Hickory shad | 6,500 | 490 | 7,700 | 616 | | | 600 | $48 |
| Jewfish | 4,629 | 232 | | | | | | |
| King whiting or "kingfish" | 15,000 | 300 | 23,250 | 1,163 | | | | |
| Mullet | 91,500 | 5,440 | 76,300 | 3,815 | | | | |
| Sea bass | 20,840 | 2,005 | 2,000 | 80 | | | | |
| Shad | 95,005 | 19,001 | 71,500 | 14,300 | | | 2,100 | 420 |
| Sheepshead | | | 700 | 42 | | | | |
| Snapper: | | | | | | | | |
| Mangrove | 200 | 16 | | | | | | |
| Red | 29,854 | 2,462 | | | | | | |
| Spot | 2,000 | 20 | 9,950 | 199 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 1,000 | 30 | 2,000 | 100 | | | | |
| Spotted | 150 | 12 | 48,300 | 3,880 | | | | |

*Fisheries of Georgia, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Chatham | | Glynn | | Liberty | | Long | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Striped bass | 500 | $100 | | | | | | |
| Sturgeon | 1,500 | 300 | | | | | | |
| Crabs, hard | | | 228,000 | $4,560 | | | | |
| Shrimp | 2,897,614 | 114,904 | 3,642,098 | 145,684 | 54,000 | $2,160 | | |
| Clams, hard, public | 2,240 | 350 | | | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 10,140 | 690 | 4,408 | 300 | | | | |
| Market, public, fall | 3,527 | 240 | 17,634 | 1,200 | | | | |
| Market, private, spring | 33,075 | 1,423 | | | 17,634 | 2,000 | | |
| Market, private, fall | 57,537 | 3,005 | | | | | | |
| Terrapin, diamond-back | 14,500 | 4,000 | 5,200 | 1,040 | | | | |
| Total | 3,315,567 | 156,539 | 4,166,090 | 178,063 | 71,634 | 4,160 | 2,700 | $468 |

| Species | McIntosh | | Screven | | Tattnall | | Wayne | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Catfish and bullheads | 212,000 | $6,360 | | | | | | |
| Hickory shad | 3,800 | 304 | | | 1,200 | $96 | 900 | $72 |
| Mullet | 9,000 | 540 | | | | | | |
| Shad | 12,000 | 2,400 | 1,900 | $380 | 11,250 | 2,250 | 4,000 | 800 |
| Sturgeon | 3,000 | 600 | | | | | | |
| Shrimp | 1,207,000 | 29,848 | | | | | | |
| Oysters, market, public, spring | 15,430 | 1,750 | | | | | | |
| Total | 1,462,230 | 41,802 | 1,900 | 380 | 12,450 | 2,346 | 4,900 | 872 |

*Industries related to the fisheries of Georgia, 1930*

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Camden County | Chatham County | Glynn County | Liberty County | McIntosh County | Total |
|---|---|---|---|---|---|---|
| Establishments | 4 | 13 | 6 | 3 | 3 | 29 |
| Persons engaged: | | | | | | |
| Proprietors | 2 | 11 | 6 | 3 | 3 | 25 |
| Salaried employees | 4 | 20 | 2 | 1 | | 27 |
| Wage earners— | | | | | | |
| Average for season | 212 | 292 | 336 | 33 | 217 | 1,090 |
| Average for year | 92 | 198 | 74 | 9 | 34 | 407 |
| Paid to salaried employees | $5,000 | $61,040 | $6,700 | $900 | $1,901 | $75,541 |
| Paid to wage earners | 40,850 | 72,611 | 40,639 | 4,753 | 19,051 | 177,904 |
| Total salaries and wages | 45,850 | 133,651 | 47,339 | 5,653 | 20,952 | 253,445 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Shrimp, canned ... standard cases | 75,744 | $437,741 |
| Oysters, canned ... do | 4,293 | 19,747 |
| Miscellaneous [1] | (2) | 172,180 |
| Total | | 629,668 |

[1] Includes cooked peeled shrimp, crab meat, canned clam chowder, canned terrapin soup and meat, menhaden products; and fresh-shucked oysters.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore they can not be correlated directly with the catch within the State.

## FLORIDA

*Fisheries of Florida, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | Other | Common | Long | Anchor | Drift | Run-around | Stake |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | 226 | 20 | | | | | | |
| On boats and shore— | | | | | | | | |
| Regular | 48 | | 831 | 297 | 21 | 206 | 2,141 | |
| Casual | | | 32 | | | 60 | 24 | 2 |
| Total | 274 | 20 | 863 | 297 | 21 | 266 | 2,165 | 2 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 11 to 20 tons | 2 | 1 | | | | | | |
| 31 to 40 tons | 2 | | | | | | | |
| 41 to 50 tons | 1 | 1 | | | | | | |
| 51 to 60 tons | 1 | | | | | | | |
| 61 to 70 tons | 1 | | | | | | | |
| 81 to 90 tons | 1 | | | | | | | |
| 151 to 160 tons | 1 | | | | | | | |
| Total | 9 | 2 | | | | | | |
| Net tonnage | 510 | 54 | | | | | | |
| Boats: | | | | | | | | |
| Motor | 8 | | 142 | 104 | 7 | 71 | 962 | |
| Other | | | 124 | 146 | | 138 | 1,738 | 2 |
| Accessory boats | 19 | 2 | | | | | | |
| Apparatus: | | | | | | | | |
| Number | 17 | 2 | 173 | 80 | 42 | 212 | 2,213 | 2 |
| Length, yards | 4,960 | 600 | 64,220 | 64,200 | | | | |
| Square yards | | | | | 25,200 | 330,450 | 2,812,854 | 1,080 |

| Item | Trammel nets | Lines | | | | Pound nets | Fyke nets | Dip nets | |
|---|---|---|---|---|---|---|---|---|---|
| | | Hand | Troll | Trot, with baits or snoods | Trot, with hooks | | | Common | Drop |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | 573 | | | | | | | |
| On boats and shore— | | | | | | | | | |
| Regular | 222 | 625 | 871 | 8 | 233 | 56 | 50 | 44 | |
| Casual | | 383 | 86 | | 8 | | | 18 | 31 |
| Total | 222 | 1,581 | 957 | 8 | 241 | 56 | 50 | 62 | 31 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | | 12 | | | | | | | |
| 11 to 20 tons | | 17 | | | | | | | |
| 21 to 30 tons | | 4 | | | | | | | |
| 31 to 40 tons | | 2 | | | | | | | |
| 41 to 50 tons | | 8 | | | | | | | |
| 51 to 60 tons | | 6 | | | | | | | |
| 61 to 70 tons | | 12 | | | | | | | |
| 71 to 80 tons | | 3 | | | | | | | |
| 91 to 100 tons | | 1 | | | | | | | |
| 101 to 110 tons | | 1 | | | | | | | |
| Total | | 66 | | | | | | | |
| Net tonnage | | 2,385 | | | | | | | |
| Sail— | | | | | | | | | |
| 51 to 60 tons | | 1 | | | | | | | |
| 61 to 70 tons | | 3 | | | | | | | |
| 131 to 140 tons | | 1 | | | | | | | |
| 141 to 150 tons | | 1 | | | | | | | |
| Total | | 6 | | | | | | | |
| Net tonnage | | 527 | | | | | | | |
| Total vessels | | 72 | | | | | | | |
| Total net tonnage | | 2,912 | | | | | | | |
| Boats: | | | | | | | | | |
| Motor | 110 | 303 | 552 | 6 | 17 | 21 | 13 | 30 | 15 |
| Other | 120 | 380 | 4 | 2 | 218 | 24 | 37 | 42 | |
| Apparatus: | | | | | | | | | |
| Number | 180 | 1,579 | 1,309 | 8 | 241 | 52 | 2,950 | 62 | 31 |
| Square yards | 129,568 | | | | | | | | |
| Hooks, baits, or snoods | | 2,809 | 1,814 | 1,700 | 106,740 | | | | |

*Fisheries of Florida, 1930*—Continued

OPERATING UNITS: By gear—Continued

| Item | Cast nets | Otter trawls, shrimp | Wire baskets | Pots | | | Spears | Dredges clam |
|---|---|---|---|---|---|---|---|---|
| | | | | Crab | Eel | Sea crawfish | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | 51 | | | | | | |
| On boats and shore— | | | | | | | | |
| Regular | | 703 | 37 | 17 | 2 | 89 | 7 | 12 |
| Casual | 44 | 10 | 8 | 2 | | | 19 | |
| Total | 44 | 764 | 45 | 19 | 2 | 89 | 26 | 12 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | 11 | | | | | | |
| 11 to 20 tons | | 11 | | | | | | |
| Total | | 22 | | | | | | |
| Net tonnage | | 236 | | | | | | |
| Boats: | | | | | | | | |
| Motor | | 305 | | 13 | 2 | 68 | | |
| Other | 19 | | 45 | 12 | | 29 | | |
| Apparatus: | | | | | | | | |
| Number | 44 | 327 | 520 | 1,383 | 90 | 2,533 | 26 | 1 |
| Yards at mouth | | 5,689 | | | | | | |

| Item | Dredges, scallop | Tongs | Forks | Hooks | | Diving outfits | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | | | | Sea crawfish | Sponge | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | | | | | | 867 |
| On boats and shore— | | | | | | | | |
| Regular | 3 | 389 | 46 | 50 | 334 | 412 | 39 | 6,176 |
| Casual | | 31 | 12 | | | | 96 | 737 |
| Total | 3 | 420 | 58 | 50 | 334 | 412 | 135 | 7,780 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | | | | | | | 23 |
| 11 to 20 tons | | | | | | | | 30 |
| 21 to 30 tons | | | | | | | | 4 |
| 31 to 40 tons | | | | | | | | 4 |
| 41 to 50 tons | | | | | | | | 10 |
| 51 to 60 tons | | | | | | | | 7 |
| 61 to 70 tons | | | | | | | | 13 |
| 71 to 80 tons | | | | | | | | 3 |
| 81 to 90 tons | | | | | | | | 1 |
| 91 to 100 tons | | | | | | | | 1 |
| 101 to 110 tons | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | 1 |
| Total | | | | | | | | 98 |
| Net tonnage | | | | | | | | 3,174 |
| Sail— | | | | | | | | |
| 51 to 60 tons | | | | | | | | 1 |
| 61 to 70 tons | | | | | | | | 3 |
| 131 to 140 tons | | | | | | | | 1 |
| 141 to 150 tons | | | | | | | | 1 |
| Total | | | | | | | | 6 |
| Net tonnage | | | | | | | | 527 |
| Total vessels | | | | | | | | 104 |
| Total net tonnage | | | | | | | | 3,701 |
| Boats: | | | | | | | | |
| Motor | 1 | 131 | 3 | 50 | | 55 | | 2,332 |
| Other | | 176 | 20 | 25 | 283 | | 32 | 3,220 |
| Accessory boats | | | | | | | | 21 |
| Apparatus: | | | | | | | | |
| Number | 2 | 420 | 58 | 2,000 | 283 | 55 | | |
| Yards at mouth | 2 | | | | | | | |

*Fisheries of Florida, 1930*—Continued

CATCH: BY GEAR

| Species | Purse seines | | | | Haul seines | | | |
|---|---|---|---|---|---|---|---|---|
| | Menhaden | | Other | | Common | | Long | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | | | | | 362,800 | $5,442 |
| Black bass | | | | | 15,899 | $1,490 | 193,308 | 19,174 |
| Bluefish | | | | | 251,204 | 7,054 | | |
| Blue runner or hardtail | | | | | 59,071 | 720 | | |
| Bonito | | | | | 1,190 | 24 | | |
| Catfish and bullheads | | | | | 396,056 | 16,874 | 2,902,291 | 124,824 |
| Cigarfish | | | | | 58,412 | 1,752 | | |
| Crappie | | | | | 3,674 | 239 | 653,670 | 26,321 |
| Crevalle | | | | | 14,274 | 271 | | |
| Croaker | | | | | 14,685 | 278 | | |
| Drum: | | | | | | | | |
| Black | | | | | 5,627 | 139 | | |
| Red or redfish | | | | | 149,974 | 4,732 | 603 | 30 |
| Flounders | | | | | 48,848 | 2,044 | | |
| Hickory shad | | | | | | | 28,428 | 852 |
| Kingfish or "king mackerel" | | | | | 5,479 | 144 | | |
| King whiting or "kingfish" | | | | | 29,053 | 966 | | |
| Menhaden | 39,863,848 | $169,956 | | | 50,322 | 1,490 | | |
| Mojarro | | | | | 44,275 | 1,208 | | |
| Mullet | | | 50,000 | $1,500 | 3,843,223 | 119,396 | | |
| Permit | | | | | 11,450 | 325 | | |
| Pigfish | | | | | 18,480 | 545 | | |
| Pinfish or sailors choice | | | | | 200 | 6 | | |
| Pompano | | | | | 66,690 | 11,528 | | |
| Sea bass | | | | | 1,320 | 36 | | |
| Shad | | | | | 295,000 | 35,400 | 143,647 | 17,316 |
| Sheepshead | | | | | 147,032 | 4,450 | | |
| Snapper, mangrove | | | | | 21,549 | 617 | | |
| Snook or sergeantfish | | | | | 240,644 | 6,673 | | |
| Spadefish | | | | | 48,528 | 1,444 | | |
| Spanish mackerel | | | | | 1,068,972 | 44,318 | | |
| Spot | | | | | 9,530 | 246 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 13,133 | 700 | | |
| Spotted | | | | | 415,838 | 27,837 | | |
| Sunfish | | | | | 7,117 | 214 | 342,392 | 10,290 |
| Tenpounder | | | | | 158,689 | 4,595 | | |
| Yellowtail | | | | | 400 | 20 | | |
| Turtles, soft-shell | | | | | | | 11,578 | 235 |
| Total | 39,863,848 | 169,956 | 50,000 | 1,500 | 7,515,838 | 297,775 | 4,638,717 | 204,484 |

| Species | Gill nets | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Runaround | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | | | 220 | $11 | | |
| Bluefish | | | 9,732 | $708 | 683,954 | 44,188 | | |
| Blue runner or hardtail | | | | | 77,834 | 1,510 | | |
| Catfish and bullheads | | | | | 58,414 | 2,976 | | |
| Crevalle | | | | | 74,862 | 2,134 | | |
| Croaker | | | | | 16,835 | 412 | | |
| Drum: | | | | | | | | |
| Black | | | | | 27,017 | 700 | | |
| Red or redfish | | | 1,000 | 50 | 630,191 | 20,720 | | |
| Eels | | | | | 600 | 40 | | |
| Flounders | | | | | 42,844 | 2,144 | | |
| Groupers | | | | | 5,000 | 400 | | |
| Hickory shad | | | 1,188 | 36 | | | | |
| Kingfish or "king mackerel" | | | | | 29,480 | 2,340 | | |
| King whiting or "kingfish" | | | 30,000 | 1,200 | 37,000 | 1,197 | | |
| Mojarro | | | | | 35,000 | 1,200 | | |
| Mullet | | | 98,111 | 4,853 | 17,225,111 | 518,878 | | |
| Muttonfish | | | | | 44,035 | 2,703 | | |
| Permit | | | | | 3,432 | 124 | | |
| Pigfish | | | | | 43,675 | 1,056 | | |
| Pinfish or sailors choice | | | | | 77,410 | 1,498 | | |
| Pompano | | | | | 192,894 | 40,369 | | |
| Shad | | | 439,384 | 75,963 | | | 1,701 | $335 |
| Sharks | 2,187,500 | $3,500 | | | | | | |
| Sheepshead | | | | | 502,007 | 16,695 | | |

*Fisheries of Florida, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Gill nets | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Anchor | | Drift | | Runaround | | Stake | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Snapper: | | | | | | | | |
| Mangrove | | | | | 59,931 | $2,414 | | |
| Red | | | | | 2,094 | 209 | | |
| Snook or sergeantfish | | | | | 104,485 | 3,792 | | |
| Spadefish | | | | | 33 | 1 | | |
| Spanish mackerel | | | 9,892 | $540 | 4,913,459 | 240,510 | | |
| Spot | | | | | 133,026 | 3,766 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 1,200 | 120 | 510,458 | 36,870 | | |
| Spotted | | | | | 1,503,508 | 105,300 | | |
| Sturgeon | | | 3,101 | 310 | 4,207 | 765 | | |
| Tenpounder | | | | | 22,672 | 618 | | |
| Yellowtail | | | | | 400 | 16 | | |
| Crabs, hard | | | | | 600 | 210 | | |
| Turtles, green | 21,550 | $1,078 | | | | | | |
| Total | 2,209,050 | 4,578 | 593,698 | 83,780 | 27,062,688 | 1,055,766 | 1,701 | $335 |

| Species | Trammel nets | | Lines | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Hand | | Troll | | Trot, with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Amberjack | | | 21,000 | $656 | | | | |
| Bluefish | 2,210 | $84 | 7,200 | 720 | 137,200 | $10,944 | | |
| Blue runner or hardtail | | | 2,200 | 40 | | | | |
| Cabio or crab eater | | | 7,761 | 344 | | | | |
| Cero | | | | | 9,950 | 480 | | |
| Crevalle | | | 1,000 | 50 | 220 | 4 | | |
| Dolphin | | | 5,000 | 500 | | | | |
| Drum: | | | | | | | | |
| Black | | | 1,980 | 54 | | | | |
| Red or redfish | 15,598 | 550 | 206,326 | 7,376 | | | | |
| Flounders | 2,145 | 135 | 700 | 28 | | | | |
| Groupers | | | 3,059,582 | 91,788 | | | | |
| Grunts | | | 21,883 | 657 | | | | |
| Hogfish | | | 2,000 | 100 | | | | |
| Jewfish | | | 26,050 | 782 | | | | |
| Kingfish or "king mackerel" | | | | | 3,592,500 | 169,336 | | |
| King whiting or "kingfish" | 880 | 24 | 3,000 | 120 | | | | |
| Mullet | 775,342 | 23,261 | | | | | | |
| Muttonfish | | | 176,004 | 12,443 | 5,000 | 300 | | |
| Pinfish or sailors choice | | | 440 | 20 | | | | |
| Pompano | 307,639 | 58,704 | | | | | | |
| Porgies | | | 54,233 | 1,627 | | | | |
| Porkfish | | | 600 | 36 | | | | |
| Sea bass | | | 47,320 | 3,170 | | | | |
| Sheepshead | 13,909 | 574 | 206,265 | 7,943 | | | | |
| Snapper: | | | | | | | | |
| Mangrove | | | 39,460 | 1,784 | | | | |
| Red | | | 5,033,608 | 426,931 | | | | |
| Snook or sergeantfish | | | 22,980 | 810 | | | | |
| Spanish mackerel | | | 33,695 | 1,820 | 48,997 | 3,430 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 72,709 | 5,515 | | | | |
| Spotted | 77,971 | 5,747 | 674,937 | 55,060 | | | | |
| Tripletail | | | 4,869 | 168 | | | | |
| Turbot | | | 900 | 54 | | | | |
| Yellowtail | | | 88,670 | 6,635 | | | | |
| Crabs, hard | | | | | | | 68,200 | $2,816 |
| Total | 1,195,694 | 89,079 | 9,822,372 | 627,231 | 3,793,867 | 184,494 | 68,200 | 2,816 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Lines—Trot, with hooks | | Pound nets | | Fyke nets | | Dip nets—Common | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Alewives | | | 2,932 | $44 | | | | |
| Black bass | | | | | 123,879 | $10,951 | | |
| Bluefish | | | 62,017 | 2,256 | | | | |
| Blue runner or hardtail | | | 615,140 | 11,730 | | | | |
| Cabio or crab eater | | | 2,546 | 93 | | | | |
| Catfish and bullheads | 608,900 | $29,227 | 235,640 | 11,445 | 32,400 | 1,428 | | |
| Crappie | | | 25,340 | 1,520 | 216,292 | 6,309 | | |
| Drum, red or redfish | | | 18,892 | 515 | | | | |
| Groupers | | | 220 | 6 | | | | |
| Kingfish or "king mackerel" | | | 58,406 | 3,186 | | | | |
| Menhaden | | | 500,000 | 5,000 | | | | |
| Mullet | | | 1,019 | 30 | | | | |
| Pompano | | | 6,130 | 1,115 | | | | |
| Porgies | | | 800 | 16 | | | | |
| Sheepshead | | | 2,920 | 106 | | | | |
| Snapper, mangrove | | | 880 | 32 | | | | |
| Spanish mackerel | | | 65,202 | 3,557 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | | | 118,312 | 8,597 | | | | |
| Sturgeon | | | 1,012 | 184 | | | | |
| Sunfish | | | 36,480 | 1,094 | 48,194 | 1,445 | | |
| Sea crawfish or spiny lobster | | | | | | | 140,333 | $11,227 |
| Total | 608,900 | 29,227 | 1,753,918 | 50,526 | 420,765 | 20,133 | 140,333 | 11,227 |

| Species | Dip nets—Drop | | Cast nets | | Otter trawls, shrimp | | Wire baskets | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | | | | | | | 112,530 | $6,138 |
| Croaker | | | | | 1,500 | $45 | | |
| Drum, red or redfish | | | | | 1,300 | 60 | | |
| Eels | | | | | | | 543 | 16 |
| Flounders | | | | | 4,700 | 199 | | |
| King whiting or "kingfish" | | | | | 53,200 | 1,658 | | |
| Mojarro | | | 2,000 | $100 | | | | |
| Mullet | | | 29,000 | 1,550 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 1,700 | 150 | | |
| Crabs, hard | 4,095 | $117 | | | | | | |
| Sea crawfish or spiny lobster | 10,000 | 1,000 | | | | | | |
| Shrimp | | | | | 16,848,576 | 635,506 | | |
| Total | 14,095 | 1,117 | 31,000 | 1,650 | 16,910,976 | 637,618 | 113,073 | 6,154 |

| Species | Pots | | | | | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | Crab | | Eel | | Sea crawfish | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Eels | | | 16,000 | $800 | | | | |
| Flounders | | | | | | | 20,374 | $1,702 |
| Crabs: | | | | | | | | |
| Hard | 38,400 | $960 | | | | | | |
| Stone | 190,050 | 12,670 | | | 114,500 | $13,660 | | |
| Sea crawfish or spiny lobster | | | | | 137,976 | 14,504 | | |
| Total | 228,450 | 13,630 | 16,000 | 800 | 252,476 | 28,164 | 20,374 | 1,702 |

| Species | Dredges | | | | Tongs | | Forks | |
|---|---|---|---|---|---|---|---|---|
| | Clam | | Scallop | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Clams: | | | | | | | | |
| Hard, public | 565,528 | $35,346 | | | 21,000 | $1,050 | 97,928 | $7,630 |
| Hard, private | | | | | 21,000 | 1,050 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 723,697 | 46,342 | | |
| Market, public, fall | | | | | 808,603 | 75,739 | | |
| Market, private, spring | | | | | 11,237 | 1,213 | | |
| Market, private, fall | | | | | 14,478 | 1,563 | | |
| Scallops, bay | | | 3,975 | $188 | | | | |
| Total | 565,528 | 35,346 | 3,975 | 188 | 1,600,015 | 126,957 | 97,928 | 7,630 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Hooks | | | | Diving outfits | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | Sea crawfish | | Sponge | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, stone | 3,000 | $300 | | | | | | |
| Clams: | | | | | | | | |
| Hard, public | | | | | | | 3,432 | $514 |
| Hard, private | | | | | | | 2,688 | 840 |
| Conches | | | 20,000 | $200 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | | | 66,471 | 5,126 |
| Market, public, fall | | | | | | | 69,639 | 5,365 |
| Market, private, spring | | | | | | | 24,308 | 1,850 |
| Market, private, fall | | | | | | | 64,820 | 5,000 |
| Scallops, bay | | | | | | | 17,892 | 1,951 |
| Terrapin, diamond-back | | | | | | | 406 | 83 |
| Sponges: | | | | | | | | |
| Grass | | | 76,718 | 24,572 | 6,200 | $1,984 | | |
| Sheepswool | | | 98,513 | 182,458 | 271,952 | 676,241 | | |
| Velvet | | | 682 | 409 | | | | |
| Wire | | | 490 | 110 | 3,291 | 1,931 | | |
| Yellow | | | 39,015 | 12,709 | 52,140 | 30,246 | | |
| Total | 3,000 | 300 | 235,418 | 220,458 | 333,583 | 710,402 | 249,656 | 20,72 |

OPERATING UNITS: BY COUNTIES

| Item | Bay | Brevard | Broward | Charlotte | Citrus | Clay | Collier | Dade |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 135 | | | | | | | 20 |
| On boats and shore— | | | | | | | | |
| Regular | 185 | 156 | 5 | 331 | 132 | 49 | 92 | 360 |
| Casual | 27 | 28 | 50 | 46 | 26 | | 25 | 25 |
| Total | 347 | 184 | 55 | 377 | 158 | 49 | 117 | 405 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | 5 | | | | | | | |
| 11 to 20 tons | 5 | | | | | | | 1 |
| 21 to 30 tons | 2 | | | | | | | |
| 41 to 50 tons | 1 | | | | | | | 1 |
| 61 to 70 tons | 3 | | | | | | | |
| Total | 16 | | | | | | | 2 |
| Net tonnage | 391 | | | | | | | 54 |
| Boats: | | | | | | | | |
| Motor | 48 | 92 | 29 | 168 | 47 | 14 | 45 | 225 |
| Other | 67 | 109 | | 324 | 145 | 31 | 61 | 60 |
| Accessory boats | | | | | | | | 2 |
| Apparatus: | | | | | | | | |
| Purse seines— | | | | | | | | |
| Other | | | | | | | | 2 |
| Length, yards | | | | | | | | 600 |
| Haul seines— | | | | | | | | |
| Common | 14 | | | 19 | | 14 | 4 | |
| Length, yards | 5,400 | | | 7,200 | | 11,600 | 1,100 | |
| Gill nets— | | | | | | | | |
| Runaround | 16 | 136 | | 329 | 85 | | 52 | 80 |
| Square yards | 9,900 | 126,450 | | 374,000 | 49,732 | | 50,230 | 200,000 |
| Trammel nets | 3 | | | 25 | | | 8 | |
| Square yards | 1,650 | | | 24,195 | | | 16,000 | |
| Lines— | | | | | | | | |
| Hand | 185 | 6 | 20 | 64 | 32 | | 27 | 55 |
| Hooks | 359 | 12 | 20 | 64 | 32 | | 27 | 55 |
| Troll | | 35 | 50 | 81 | 2 | | | 230 |
| Hooks | | 35 | 60 | 81 | 2 | | | 460 |
| Trot, with hooks | | 2 | | | | 44 | | |
| Hooks | | 600 | | | | 20,400 | | |
| Dip nets, drop | | | | | | | | 25 |
| Otter trawls, shrimp | 1 | 13 | | | | | | |
| Yards at mouth | 10 | 260 | | | | | | |
| Pots— | | | | | | | | |
| Crab | | 38 | | | | | | |
| Sea crawfish | | | 240 | | | | | 2,000 |
| Spears | 7 | | | | | | | |
| Dredges, clam | | | | | | | 1 | |
| Tongs | 62 | | | 4 | 38 | | | |
| Forks | | | | | | | 15 | |
| Hooks, sea crawfish | | | | | | | | 2,000 |

*Fisheries of Florida, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Dixie | Duval | Escambia | Franklin | Glades | Gulf | Hendry | Hillsborough |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 10 | 329 | 26 | | 60 | | 15 |
| On boats and shore— | | | | | | | | |
| Regular | 20 | 197 | 174 | 497 | 122 | 123 | 5 | 84 |
| Casual | 8 | 50 | 6 | 14 | | 6 | | 8 |
| Total | 28 | 257 | 509 | 537 | 122 | 189 | 5 | 107 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | 1 | | 6 | | | | |
| 11 to 20 tons | | 1 | 4 | 1 | | | | 3 |
| 21 to 30 tons | | | 1 | | | | | |
| 31 to 40 tons | | | | | | 1 | | |
| 41 to 50 tons | | | 7 | | | | | |
| 51 to 60 tons | | | 6 | | | | | |
| 61 to 70 tons | | | 9 | | | 1 | | |
| 71 to 80 tons | | | 3 | | | | | |
| 91 to 100 tons | | | 1 | | | | | |
| 101 to 110 tons | | | 1 | | | | | |
| Total | | 2 | 32 | 7 | | 2 | | 3 |
| Net tonnage | | 18 | 1,744 | 51 | | 96 | | 36 |
| Sail— | | | | | | | | |
| 51 to 60 tons | | | 1 | | | | | |
| 61 to 70 tons | | | 3 | | | | | |
| 131 to 140 tons | | | 1 | | | | | |
| 141 to 150 tons | | | 1 | | | | | |
| Total | | | 6 | | | | | |
| Net tonnage | | | 527 | | | | | |
| Total vessels | | 2 | 38 | 7 | | 2 | | 3 |
| Total net tonnage | | 18 | 2,271 | 51 | | 96 | | 36 |
| Boats: | | | | | | | | |
| Motor | 5 | 81 | 53 | 181 | 41 | 21 | 2 | 34 |
| Other | 28 | 121 | 34 | 102 | 44 | 8 | 3 | 67 |
| Apparatus: | | | | | | | | |
| Purse seines— | | | | | | | | |
| Menhaden | | | | | | 10 | | |
| Length, yards | | | | | | 2,960 | | |
| Haul seines— | | | | | | | | |
| Common | | 12 | 5 | 10 | | 8 | | |
| Length, yards | | 3,000 | 1,770 | 3,750 | | 3,200 | | |
| Long | | | | | 19 | | 1 | |
| Length, yards | | | | | 18,000 | | 900 | |
| Gill nets— | | | | | | | | |
| Drift | | 143 | | 6 | | | | |
| Square yards | | 200,200 | | 6,000 | | | | |
| Runaround | 15 | 17 | 12 | 33 | | 9 | | 50 |
| Square yards | 5,375 | 23,800 | 72,000 | 21,090 | | 24,000 | | 37,085 |
| Trammel nets | | | 26 | | | | | |
| Square yards | | | 13,520 | | | | | |
| Lines— | | | | | | | | |
| Hand | 28 | 35 | 393 | 57 | | 6 | | 42 |
| Hooks | 28 | 70 | 1,115 | 114 | | 6 | | 63 |
| Trot, with baits or snoods | | 6 | | | | | | |
| Baits or snoods | | 900 | | | | | | |
| Trot, with hooks | | 38 | | 20 | 1 | | | |
| Hooks | | 12,400 | | 1,800 | 500 | | | |
| Pound nets | | | | | | 3 | | |
| Fyke nets | | | | | 1,700 | 100 | | |
| Dip nets, drop | | | 6 | | | | | |
| Cast nets | | 25 | | | | | | |
| Otter trawls, shrimp | | 16 | 4 | 65 | | | | |
| Yards at mouth | | 320 | 48 | 771 | | | | |
| Wire baskets | | | | 520 | | | | |
| Spears | | | | 9 | | | | |
| Dredges, scallop | | | | 2 | | | | |
| Yards at mouth | | | | 2 | | | | |
| Tongs | | | 29 | 196 | | | | |

*Fisheries of Florida, 1930*—Continued

OPERATING UNITS: By counties—Continued

| Item | Indian River | Jefferson | Lee | Levy | Manatee | Martin | Monroe | Nassau |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | | | 5 | 179 |
| On boats and shore— | | | | | | | | |
| Regular | 54 | 11 | 88 | 153 | 119 | 30 | 493 | 121 |
| Casual | | 8 | 42 | 28 | 8 | 10 | 18 | 23 |
| Total | 54 | 19 | 130 | 181 | 127 | 40 | 516 | 323 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | | | | | | 1 | 3 |
| 11 to 20 tons | | | | | | | | 5 |
| 31 to 40 tons | | | | | | | | 1 |
| 41 to 50 tons | | | | | | | | 1 |
| 51 to 60 tons | | | | | | | | 1 |
| 81 to 90 tons | | | | | | | | 1 |
| 151 to 160 tons | | | | | | | | 1 |
| Total | | | | | | | 1 | 13 |
| Net tonnage | | | | | | | 6 | 475 |
| Boats: | | | | | | | | |
| Motor | 30 | 3 | 56 | 68 | 56 | 20 | 146 | 38 |
| Other | 29 | 18 | 113 | 149 | 94 | 5 | 333 | 41 |
| Accessory boats | | | | | | | | 19 |
| Apparatus: | | | | | | | | |
| Purse seines— | | | | | | | | |
| Menhaden | | | | | | | | 7 |
| Length, yards | | | | | | | | 2,000 |
| Haul seines— | | | | | | | | |
| Common | | | 6 | | 7 | | | |
| Length, yards | | | 2,100 | | 1,850 | | | |
| Gill nets— | | | | | | | | |
| Anchor | | | | | | | 42 | |
| Square yards | | | | | | | 25,200 | |
| Drift | | | | | | | | 10 |
| Square yards | | | | | | | | 2,250 |
| Runaround | 49 | 11 | 80 | 90 | 100 | 30 | 89 | 2 |
| Square yards | 47,700 | 6,425 | 58,190 | 36,365 | 126,200 | 36,000 | 166,150 | 1,800 |
| Stake | | | | | | | | 2 |
| Square yards | | | | | | | | 1,080 |
| Trammel nets | | | 4 | 12 | 7 | | | |
| Square yards | | | 5,000 | 2,025 | 4,640 | | | |
| Lines— | | | | | | | | |
| Hand | 5 | 18 | 48 | 49 | 26 | | 68 | 30 |
| Hooks | 10 | 18 | 48 | 49 | 26 | | 68 | 60 |
| Troll | 30 | | 24 | 20 | 30 | 20 | 102 | |
| Hooks | 30 | | 24 | 20 | 30 | 40 | 102 | |
| Pound nets | | | | 12 | | | | |
| Dip nets, common | | | | | | | 62 | |
| Otter trawls, shrimp | | | | | | | | 44 |
| Yards at mouth | | | | | | | | 880 |
| Pots— | | | | | | | | |
| Crab | | | | | 60 | | | |
| Sea crawfish | | | | | | | 253 | |
| Tongs | | | | 33 | | | | |
| Forks | | | | | 1 | | | |
| Hooks, sponge | | | | | | | 232 | |

| Item | Okaloosa | Okeechobee | Palm Beach | Pasco | Pinellas | Putnam | St. Johns | St. Lucie |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | 62 | | 20 | 2 |
| On boats and shore— | | | | | | | | |
| Regular | 120 | 37 | 250 | 28 | 805 | 244 | 210 | 184 |
| Casual | | | 18 | | 119 | | | |
| Total | 120 | 37 | 268 | 28 | 986 | 244 | 230 | 186 |
| Vessels: | | | | | | | | |
| Motor— | | | | | | | | |
| 5 to 10 tons | | | | | 2 | | 4 | |
| 11 to 20 tons | | | | | 4 | | 4 | 1 |
| 21 to 30 tons | | | | | 1 | | | |
| 31 to 40 tons | | | | | 2 | | | |
| Total | | | | | 9 | | 8 | 1 |
| Net tonnage | | | | | 172 | | 99 | 16 |

*Fisheries of Florida, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Okaloosa | Okeechobee | Palm Beach | Pasco | Pinellas | Putnam | St. Johns | St. Lucie |
|---|---|---|---|---|---|---|---|---|
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 29 | 8 | 130 | 14 | 167 | 80 | 77 | 92 |
| Other | 28 | 27 | 25 | 28 | 294 | 151 | 19 | 40 |
| Apparatus: | | | | | | | | |
| Haul seines— | | | | | | | | |
| Common | 14 | | | | 10 | | | |
| Length, yards | 5,600 | | | | 4,150 | | | |
| Long | | 8 | | | | 50 | | |
| Length, yards | | 6,400 | | | | 37,700 | | |
| Gill nets— | | | | | | | | |
| Drift | | | | | 14 | 38 | 1 | |
| Square yards | | | | | 8,400 | 113,000 | 600 | |
| Runaround | 2 | | 84 | 28 | 260 | | 6 | 126 |
| Square yards | 712 | | 168,000 | 17,460 | 451,760 | | 3,000 | 207,940 |
| Trammel nets | 32 | | | | 3 | | | |
| Square yards | 17,088 | | | | 2,250 | | | |
| Lines— | | | | | | | | |
| Hand | 56 | | | | 181 | | 10 | |
| Hooks | 112 | | | | 283 | | 20 | |
| Troll | | | 210 | | 86 | | | 168 |
| Hooks | | | 420 | | 121 | | | 168 |
| Trot, with hooks | | 2 | | | | 36 | | |
| Hooks | | 600 | | | | 11,640 | | |
| Pound nets | | | | | | 37 | | |
| Fyke nets | | 1,030 | | | | 120 | | |
| Cast nets | | | 15 | | | | | |
| Otter trawls, shrimp | | | | | | | 85 | 51 |
| Yards at mouth | | | | | | | 1,700 | 740 |
| Pots— | | | | | | | | |
| Crab | | | | | 1,285 | | | |
| Eel | | | | | | 90 | | |
| Sea crawfish | | | | | | | 40 | |
| Spears | 2 | | | | | | | |
| Tongs | 2 | | | | | | | 6 |
| Forks | | | | | 12 | | 15 | |
| Hooks, sponge | | | | | 51 | | | |
| Diving outfits | | | | | 55 | | | |

| Item | Santa Rosa | Sarasota | Seminole | Taylor | Volusia | Wakulla | Walton |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | 4 | | |
| On boats and shore— | | | | | | | |
| Regular | 12 | 204 | 98 | 66 | 140 | 167 | 10 |
| Casual | 6 | 35 | | 45 | 23 | 35 | |
| Total | 18 | 239 | 98 | 111 | 167 | 202 | 10 |
| Vessels: | | | | | | | |
| Motor— | | | | | | | |
| 5 to 10 tons | | | | | 1 | | |
| 11 to 20 tons | | | | | 1 | | |
| Total | | | | | 2 | | |
| Net tonnage | | | | | 16 | | |
| Boats: | | | | | | | |
| Motor | 6 | 101 | | 16 | 64 | 42 | 3 |
| Other | 5 | 207 | 98 | 111 | 65 | 131 | 5 |
| Apparatus: | | | | | | | |
| Haul seines— | | | | | | | |
| Common | | 24 | 20 | | 2 | 4 | |
| Length, yards | | 8,400 | 3,600 | | 300 | 1,200 | |
| Long | | | | | 2 | | |
| Length, yards | | | | | 1,200 | | |
| Gill nets— | | | | | | | |
| Runaround | | 220 | | 62 | 23 | 117 | |
| Square yards | | 390,740 | | 23,450 | 17,250 | 60,050 | |
| Trammel nets | 5 | 10 | | | | 40 | 5 |
| Square yards | 2,200 | 25,500 | | | | 14,000 | 1,500 |

*Fisheries of Florida, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Santa Rosa | Sarasota | Seminole | Taylor | Volusia | Wakulla | Walton |
|---|---|---|---|---|---|---|---|
| Apparatus—Continued. | | | | | | | |
| Lines— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Hand | | 41 | | 85 | 12 | | |
| Hooks | | 41 | | 85 | 24 | | |
| Troll | | 221 | | | | | |
| Hooks | | 221 | | | | | |
| Trot, with baits or snoods | | | | | 2 | | |
| Baits or snoods | | | | | 800 | | |
| Trot, with hooks | | | 98 | | | | |
| Hooks | | | 58,800 | | | | |
| Cast nets | | | | | 4 | | |
| Otter trawls, shrimp | | | | | 48 | | |
| Yards at mouth | | | | | 960 | | |
| Spears | 8 | | | | | | |
| Tongs | 8 | | | | 30 | 12 | |
| Forks | | | | | 15 | | |

CATCH: BY COUNTIES

| Species | Bay | | Brevard | | Broward | | Charlotte | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bluefish | 143,902 | $2,904 | 83,230 | $6,363 | 2,000 | $200 | 93,025 | $5,197 |
| Blue runner or hardtail | 4,950 | 90 | | | | | 18,535 | 341 |
| Bonito | | | | | | | 990 | 18 |
| Cabio or crab eater | | | | | | | 6,545 | 298 |
| Catfish and bullheads | | | 32,000 | 1,280 | | | | |
| Cigarfish | 30,000 | 900 | | | | | | |
| Crevalle | | | 4,200 | 126 | 1,000 | 50 | 11,880 | 221 |
| Croaker | | | 1,500 | 45 | | | 5,885 | 120 |
| Dolphin | | | | | 5,000 | 500 | | |
| Drum: | | | | | | | | |
| Black | | | 7,515 | 220 | | | 440 | 12 |
| Red or redfish | 5,230 | 167 | 43,585 | 2,043 | | | 171,590 | 6,918 |
| Flounders | 3,850 | 252 | 1,700 | 44 | | | 32,230 | 1,178 |
| Groupers | 711,571 | 21,350 | | | 10,000 | 300 | 5,720 | 172 |
| Grunts | | | | | | | 4,300 | 129 |
| Jewfish | | | | | | | 2,600 | 78 |
| Kingfish or "king mackerel" | | | 1,800 | 90 | 140,000 | 8,100 | 37,114 | 1,707 |
| King whiting or "kingfish" | | | 10,100 | 354 | | | 7,040 | 192 |
| Menhaden | 25,000 | 750 | | | | | | |
| Mojarro | | | | | | | 44,275 | 1,208 |
| Mullet | 544,328 | 18,078 | 1,379,870 | 35,075 | | | 3,762,776 | 112,883 |
| Muttonfish | | | | | 5,000 | 750 | 24,804 | 1,057 |
| Permit | | | | | | | 12,352 | 370 |
| Pigfish | | | 4,189 | 84 | | | 16,880 | 506 |
| Pinfish or sailors choice | | | 52,270 | 895 | | | | |
| Pompano | 1,354 | 246 | 13,256 | 2,816 | | | 128,587 | 23,146 |
| Porgies | 8,800 | 264 | | | | | | |
| Sheepshead | 5,665 | 172 | 69,698 | 2,172 | | | 158,115 | 5,885 |
| Snapper: | | | | | | | | |
| Mangrove | | | 1,500 | 75 | | | 37,939 | 1,140 |
| Red | 870,940 | 69,678 | | | | | | |
| Snook or sergeantfish | | | 4,000 | 160 | | | 94,644 | 2,581 |
| Spadefish | | | | | | | 46,306 | 1,389 |
| Spanish mackerel | 533,407 | 20,350 | 26,000 | 1,820 | 500 | 75 | 458,062 | 20,826 |
| Spot | | | 62,808 | 1,592 | | | 5,830 | 159 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 332,619 | 22,787 | | | | |
| Spotted | 62,346 | 4,374 | | | | | 613,888 | 43,044 |
| Tenpounder | 90,000 | 2,700 | | | | | | |
| Tripletail | | | | | | | 1,100 | 40 |
| Yellowtail | | | | | | | 6,600 | 312 |
| Crabs, hard | | | 39,000 | 1,170 | | | | |
| Sea crawfish or spiny lobster | | | | | 15,000 | 3,000 | | |
| Shrimp | 10,000 | 800 | 405,000 | 16,200 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 70,932 | 5,994 | | | | | 4,250 | 375 |
| Market, public, fall | 92,582 | 8,169 | | | | | 7,140 | 525 |
| Total | 3,214,857 | 157,238 | 2,575,840 | 95,411 | 178,500 | 12,975 | 5,821,442 | 232,027 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Citrus | | Clay | | Collier | | Dade | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Amberjack | | | | | | | 2,500 | $100 |
| Black bass | | | 15,899 | $1,490 | | | | |
| Bluefish | 7,855 | $286 | | | 1,925 | $88 | 15,000 | 1,500 |
| Blue runner or hardtail | | | | | 15,675 | 285 | 7,000 | 140 |
| Catfish and bullheads | | | 444,708 | 19,397 | | | | |
| Cero | | | | | | | 5,000 | 300 |
| Crappie | | | 3,674 | 239 | | | | |
| Crevalle | | | | | 1,650 | 30 | 5,000 | 150 |
| Drum: | | | | | | | | |
| Black | | | | | 440 | 12 | | |
| Red or redfish | 54,682 | 1,491 | | | 90,640 | 2,472 | 7,000 | 280 |
| Flounders | 682 | 37 | | | 880 | 38 | | |
| Groupers | 2,250 | 68 | | | 3,500 | 105 | 30,000 | 900 |
| Grunts | | | | | 2,500 | 75 | 7,000 | 210 |
| Hogfish | | | | | | | 2,000 | 100 |
| Jewfish | | | | | 400 | 12 | 8,000 | 240 |
| Kingfish or "king mackerel" | 1,896 | 103 | | | | | 900,000 | 40,500 |
| King whiting or "kingfish" | | | | | 1,650 | 30 | | |
| Mullet | 1,150,695 | 34,521 | | | 771,344 | 15,427 | 450,000 | 9,500 |
| Muttonfish | | | | | | | 100,000 | 7,000 |
| Permit | | | | | 880 | 24 | | |
| Pigfish | 660 | 18 | | | 2,300 | 69 | | |
| Pompano | 198 | 36 | | | 75,930 | 15,186 | 8,000 | 1,600 |
| Porgies | | | | | | | 8,000 | 240 |
| Sheepshead | 13,676 | 505 | | | 106,132 | 3,037 | 2,000 | 80 |
| Snapper: | | | | | | | | |
| Mangrove | 12,633 | 345 | | | | | 3,000 | 180 |
| Red | | | | | | | 14,000 | 1,120 |
| Snook or sergeantfish | | | | | 50,283 | 1,371 | | |
| Spanish mackerel | 1,320 | 72 | | | 159,049 | 7,230 | 900,000 | 45,000 |
| Spot | | | | | 440 | 8 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 24,000 | 2,400 |
| Spotted | 131,416 | 10,247 | | | 79,838 | 4,860 | | |
| Sunfish | | | 7,117 | 214 | | | | |
| Tenpounder | 22,491 | 613 | | | | | | |
| Tripletail | | | | | 440 | 12 | | |
| Yellowtail | | | | | 4,900 | 245 | 40,000 | 3,200 |
| Crabs, stone | | | | | | | 103,000 | 12,800 |
| Sea crawfish or spiny lobster | | | | | | | 90,000 | 9,000 |
| Clams, hard, public | | | | | 645,528 | 40,346 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 18,923 | 1,270 | | | | | | |
| Market, public, fall | 57,410 | 3,853 | | | | | | |
| Total | 1,476,787 | 53,465 | 471,398 | 21,340 | 2,016,324 | 90,962 | 2,730,500 | 136,540 |

| Species | Dixie | | Duval | | Escambia | | Franklin | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Amberjack | | | 220 | $11 | | | 1,400 | $42 |
| Bluefish | 2,640 | $96 | 4,500 | 450 | 46,215 | $1,337 | 63,685 | 2,252 |
| Blue runner or hardtail | | | | | 25,931 | 236 | 2,200 | 40 |
| Cabio or crab eater | | | | | 314 | 13 | | |
| Catfish and bullheads | | | 69,000 | 3,450 | | | 218,592 | 11,086 |
| Crevalle | | | 233 | 10 | | | | |
| Croaker | | | 3,000 | 90 | 2,200 | 40 | | |
| Drum: | | | | | | | | |
| Black | | | 2,500 | 75 | 2,107 | 57 | 440 | 12 |
| Red or redfish | 5,280 | 192 | 3,000 | 190 | 6,633 | 181 | 29,585 | 813 |
| Eels | | | | | | | 543 | 16 |
| Flounders | 1,650 | 90 | 1,296 | 65 | 1,556 | 113 | 10,345 | 652 |
| Groupers | | | | | 1,312,024 | 39,353 | 299,226 | 8,977 |
| Jewfish | | | | | 2,095 | 63 | 1,800 | 54 |
| Kingfish or "king mackerel" | | | | | 2,439 | 44 | | |
| King whiting or "kingfish" | | | 48,700 | 1,948 | 423 | 8 | 3,300 | 90 |
| Menhaden | | | | | | | 7,000 | 210 |
| Mullet | 132,410 | 5,296 | 97,833 | 4,892 | 363,592 | 10,908 | 960,050 | 28,801 |
| Pigfish | 500 | 15 | | | 660 | 12 | | |
| Pompano | 2,970 | 540 | 1,133 | 226 | 10,266 | 1,867 | 1,606 | 292 |
| Porgies | | | | | 9,313 | 282 | 6,000 | 180 |
| Sea bass | | | 44,000 | 3,080 | | | 1,320 | 36 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Dixie | | Duval | | Escambia | | Franklin | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Shad | | | 262,875 | $48,817 | | | | |
| Sheepshead | 5,060 | $230 | 1,000 | 80 | 4,423 | $201 | 2,183 | $65 |
| Snapper, red | | | 10,936 | 1,093 | 2,902,878 | 256,221 | 374,761 | 30,081 |
| Snook or sergeantfish | | | 1,360 | 136 | | | | |
| Spadefish | | | | | 62 | 1 | 220 | 4 |
| Spanish mackerel | 3,740 | 204 | 3,000 | 300 | 315,941 | 9,479 | 45,236 | 1,628 |
| Spot | 220 | 6 | 12,960 | 390 | 80 | 1 | 440 | 12 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 6,200 | 520 | 66 | 1 | | |
| Spotted | 38,108 | 2,771 | 26,809 | 2,680 | 9,692 | 705 | 74,380 | 5,410 |
| Sturgeon | | | | | | | 3,041 | 276 |
| Tenpounder | | | | | | | 17,359 | 495 |
| Tripletail | | | | | | | 2,009 | 80 |
| Crabs, hard | | | 48,400 | 2,420 | 4,095 | 117 | | |
| Shrimp | | | 1,145,714 | 45,828 | 14,718 | 1,472 | 1,564,261 | 61,853 |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 62,492 | 5,514 | 523,637 | 29,386 |
| Market, public, fall | | | | | 72,830 | 6,435 | 515,577 | 51,202 |
| Scallops, bay | | | | | | | 3,975 | 188 |
| Total | 192,578 | 9,440 | 1,794,669 | 116,751 | 5,173,045 | 334,661 | 4,734,171 | 234,233 |

| Species | Glades | | Gulf | | Hendry | | Hillsborough | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Black bass | 155,935 | $14,035 | | | 5,400 | $432 | | |
| Bluefish | | | 77,000 | $2,800 | | | 220 | $12 |
| Blue runner or hardtail | | | 300,000 | 6,000 | | | | |
| Catfish and bullheads | 1,191,330 | 47,653 | | | 84,000 | 3,360 | | |
| Crappie | 499,410 | 14,802 | | | 5,100 | 153 | | |
| Crevalle | | | | | | | 932 | 17 |
| Croaker | | | 880 | 8 | | | | |
| Drum, red or redfish | | | 7,700 | 280 | | | 36,803 | 1,346 |
| Flounders | | | 3,850 | 185 | | | 17,622 | 960 |
| Groupers | | | | | | | 209,185 | 6,282 |
| Grunts | | | | | | | 37 | 1 |
| Kingfish or "king mackerel" | | | 1,100 | 50 | | | | |
| Menhaden | | | 6,123,440 | 29,076 | | | | |
| Mullet | | | 411,350 | 16,454 | | | 542,605 | 17,278 |
| Pompano | | | 21,102 | 2,891 | | | 3,175 | 597 |
| Porgies | | | | | | | 1,200 | 36 |
| Sheepshead | | | 2,750 | 100 | | | 21,233 | 782 |
| Snapper: | | | | | | | | |
| Mangrove | | | | | | | 660 | 18 |
| Red | | | | | | | 225,123 | 18,010 |
| Snook or sergeantfish | | | | | | | 24,585 | 670 |
| Spadefish | | | | | | | 33 | 1 |
| Spanish mackerel | | | 248,094 | 13,532 | | | 1,760 | 96 |
| Spot | | | 220 | 6 | | | 134 | 2 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 2,233 | 61 |
| Spotted | | | 34,585 | 2,563 | | | 136,373 | 10,108 |
| Sunfish | 103,652 | 3,109 | | | 8,200 | 246 | | |
| Tenpounder | | | 12,000 | 240 | | | 181 | 5 |
| Total | 1,950,327 | 79,599 | 7,244,071 | 74,185 | 102,700 | 4,191 | 1,224,094 | 56,282 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Indian River | | Jefferson | | Lee | | Levy | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bluefish | 6,700 | $804 | | | 4,765 | $217 | 89,133 | $3,245 |
| Blue runner or hardtail | | | | | 990 | 18 | 320,552 | 5,828 |
| Cabio or crab eater | | | | | | | 2,546 | 93 |
| Crevalle | 9,800 | 294 | | | | | | |
| Croaker | 3,000 | 68 | | | 1,650 | 30 | | |
| Drum: | | | | | | | | |
| Black | 3,600 | 108 | | | | | 2,640 | 72 |
| Red or redfish | 6,300 | 287 | 10,175 | $370 | 49,665 | 1,355 | 76,667 | 2,091 |
| Eels | 600 | 40 | | | | | | |
| Flounders | | | | | 2,035 | 92 | 2,970 | 162 |
| Groupers | | | | | | | 8,710 | 261 |
| Kingfish or "king mackerel" | 4,000 | 240 | | | 26,769 | 1,217 | 208,103 | 11,351 |
| King whiting or "kingfish" | 16,500 | 570 | | | 440 | 8 | | |
| Mullet | 300,669 | 9,020 | 171,050 | 6,862 | 756,349 | 25,744 | 892,958 | 26,788 |
| Muttonfish | 18,000 | 720 | | | | | | |
| Pigfish | 2,800 | 84 | | | 1,200 | 36 | | |
| Pinfish or sailors choice | 11,600 | 232 | | | | | | |
| Pompano | 18,233 | 4,257 | | | 17,600 | 3,520 | 19,957 | 3,647 |
| Porgies | | | | | | | 1,050 | 21 |
| Sea bass | | | | | | | 3,320 | 90 |
| Sheepshead | 7,300 | 292 | 4,840 | 188 | 64,361 | 1,996 | 40,079 | 1,540 |
| Snapper, mangrove | 12,400 | 739 | 990 | 36 | 2,600 | 96 | 2,930 | 112 |
| Snook or sergeantfish | 27,000 | 1,080 | | | 20,582 | 561 | | |
| Spanish mackerel | 22,997 | 1,610 | | | 89,476 | 4,067 | 79,294 | 4,411 |
| Spot | 42,000 | 1,260 | 220 | 6 | | | 704 | 13 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 83,695 | 8,370 | | | | | | |
| Spotted | | | 39,138 | 2,846 | 138,838 | 7,819 | 314,947 | 23,794 |
| Sturgeon | | | | | | | 5,219 | 949 |
| Yellowtail | | | | | 1,720 | 64 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 1,275 | 112 | 12,446 | 980 |
| Market, public, fall | | | | | 2,550 | 225 | 15,773 | 1,242 |
| Total | 597,194 | 30,075 | 226,413 | 10,308 | 1,182,865 | 47,177 | 2,100,898 | 86,690 |

| Species | Manatee | | Martin | | Monroe | | Nassau | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bluefish | 16,207 | $1,131 | 32,449 | $4,543 | 16,720 | $900 | 800 | $80 |
| Blue runner or hardtail | 2,090 | 38 | | | 11,789 | 214 | | |
| Cabio or crab eater | 660 | 24 | | | | | | |
| Cero | | | | | 4,950 | 180 | | |
| Crevalle | 990 | 18 | 15,000 | 600 | 1,980 | 36 | | |
| Croaker | 1,320 | 36 | 500 | 15 | | | 100 | 4 |
| Drum: | | | | | | | | |
| Black | 440 | 12 | 500 | 15 | 440 | 12 | | |
| Red or redfish | 135,918 | 4,952 | 2,000 | 80 | 22,770 | 633 | 100 | 3 |
| Flounders | 990 | 54 | | | 550 | 25 | 3,000 | 150 |
| Groupers | 2,500 | 75 | | | 27,000 | 810 | | |
| Grunts | 400 | 12 | | | 5,700 | 171 | | |
| Jewfish | | | | | 8,800 | 264 | | |
| Kingfish or "king mackerel" | 5,720 | 312 | 59,585 | 2,979 | 852,340 | 31,012 | | |
| King whiting or "kingfish" | | | 600 | 24 | | | 20,250 | 610 |
| Menhaden | | | | | | | 34,242,408 | 145,920 |
| Mojarro | | | 15,000 | 600 | | | | |
| Mullet | 1,402,800 | 52,352 | 364,617 | 10,939 | 524,208 | 11,884 | | |
| Muttonfish | | | 24,035 | 1,923 | 46,200 | 3,636 | | |
| Permit | 1,100 | 40 | | | | | | |
| Pigfish | 1,000 | 40 | | | 600 | 18 | | |
| Pinfish or sailors choice | | | | | 440 | 20 | | |
| Pompano | 22,980 | 4,160 | 35,004 | 8,751 | 2,382 | 325 | | |
| Porgies | 800 | 24 | | | 1,500 | 45 | | |
| Porkfish | | | | | 600 | 36 | | |
| Shad | | | | | | | 14,301 | 2,825 |
| Sharks | | | | | 2,187,500 | 3,500 | | |
| Sheepshead | 64,790 | 2,407 | 7,530 | 452 | 21,450 | 691 | | |
| Snapper: | | | | | | | | |
| Mangrove | 1,760 | 64 | 5,000 | 300 | 16,500 | 900 | | |
| Red | | | | | 27,000 | 2,160 | 7,000 | 490 |
| Snook or sergeantfish | 65,112 | 1,887 | 3,000 | 180 | | | | |
| Spanish mackerel | 209,981 | 11,562 | | | 1,136,503 | 42,255 | | |
| Spot | 440 | 12 | 8,000 | 320 | 880 | 32 | 200 | 8 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Manatee | | Martin | | Monroe | | Nassau | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | | | 2,500 | $250 |
| Spotted | 184,859 | $13,845 | 11,762 | $1,176 | 46,156 | $2,663 | 15,000 | 1,500 |
| Sturgeon | | | | | | | 150 | 34 |
| Tripletail | | | | | 1,320 | 36 | | |
| Turbot | | | | | 900 | 54 | | |
| Yellowtail | | | | | 36,250 | 2,850 | | |
| Crabs, stone | 45,000 | 3,000 | | | 14,500 | 1,160 | | |
| Sea crawfish or spiny lobster | | | | | 180,000 | 14,400 | | |
| Shrimp | | | | | | | 3,229,533 | 129,179 |
| Clams: | | | | | | | | |
| Hard, public | 9,600 | 1,200 | | | | | | |
| Hard, private | | | | | | | 2,688 | 840 |
| Conchs | | | | | 20,000 | 200 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | | | 64,224 | 4,954 |
| Market, public, fall | | | | | | | 64,820 | 5,000 |
| Market, private, spring | | | | | | | 24,308 | 1,850 |
| Market, private, fall | | | | | | | 64,820 | 5,000 |
| Turtles, green | | | | | 21,550 | 1,078 | | |
| Sponges: | | | | | | | | |
| Grass | | | | | 20,908 | 6,710 | | |
| Sheepswool | | | | | 50,520 | 63,121 | | |
| Velvet | | | | | 682 | 409 | | |
| Wire | | | | | 490 | 110 | | |
| Yellow | | | | | 29,814 | 7,372 | | |
| Total | 2,177,457 | 97,257 | 584,582 | 32,897 | 5,341,892 | 199,922 | 37,756,202 | 298,697 |

| Species | Okaloosa | | Okeechobee | | Palm Beach | | Pasco | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Amberjack | 100 | $4 | | | | | | |
| Black bass | | | 56,166 | $4,493 | | | | |
| Bluefish | 28,861 | 866 | | | 226,000 | $18,300 | 1,760 | $96 |
| Blue runner or hardtail | 18,400 | 184 | | | 10,000 | 200 | | |
| Bonito | 200 | 6 | | | | | | |
| Catfish and bullheads | | | 567,200 | 22,768 | | | | |
| Cigarfish | 28,412 | 852 | | | | | | |
| Crappie | | | 143,464 | 4,304 | | | | |
| Crevalle | | | | | 10,000 | 300 | | |
| Croaker | | | | | 2,000 | 60 | | |
| Drum: | | | | | | | | |
| Black | 200 | 6 | | | | | | |
| Red or redfish | 6,344 | 302 | | | 1,000 | 50 | 20,350 | 555 |
| Flounders | 5,119 | 425 | | | | | | |
| Groupers | 51,847 | 1,555 | | | 5,000 | 400 | | |
| Jewfish | 700 | 21 | | | | | | |
| Kingfish or "king mackerel" | 1,500 | 30 | | | 655,000 | 32,750 | | |
| King whiting or "kingfish" | 500 | 10 | | | 3,000 | 90 | | |
| Menhaden | 16,322 | 490 | | | | | | |
| Mojarro | | | | | 2,000 | 100 | | |
| Mullet | 236,703 | 7,101 | | | 14,000 | 700 | 500,752 | 15,023 |
| Muttonfish | | | | | 7,000 | 360 | | |
| Pompano | 11,269 | 2,254 | | | 16,500 | 3,550 | | |
| Porgies | 14,970 | 449 | | | | | | |
| Sheepshead | 3,700 | 195 | | | 1,000 | 40 | 880 | 32 |
| Snapper: | | | | | | | | |
| Mangrove | | | | | 1,500 | 75 | 7,150 | 260 |
| Red | 34,516 | 2,761 | | | | | | |
| Snook or sergeantfish | | | | | 2,000 | 80 | | |
| Spadefish | 400 | 8 | | | | | | |
| Spanish mackerel | 160,574 | 4,817 | | | 650,000 | 39,000 | 4,950 | 225 |
| Spot | 900 | 18 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | | | 1,500 | 120 | | |
| Spotted | 23,542 | 1,727 | | | | | 17,586 | 1,279 |
| Sunfish | | | 47,375 | 1,421 | | | | |
| Tenpounder | 32,180 | 965 | | | | | | |
| Oysters, market, public, fall | 5,100 | 450 | | | | | | |
| Total | 682,359 | 25,496 | 814,205 | 32,986 | 1,607,500 | 96,175 | 553,428 | 17,470 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Pinellas | | Putnam | | St. Johns | | St. Lucie | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | | | 365,732 | $5,486 | | | | |
| Amberjack | 17,000 | $510 | | | | | | |
| Black bass | | | 97,286 | 10,925 | | | | |
| Bluefish | 109,826 | 6,463 | | | 4,350 | $435 | 25,000 | $2,750 |
| Blue runner or hardtail | 243 | 4 | | | | | 5,000 | 100 |
| Cabio or crab eater | 242 | 9 | | | | | | |
| Catfish and bullheads | | | 1,383,401 | 66,118 | | | | |
| Crappie | | | 241,128 | 14,519 | | | | |
| Crevalle | 1,171 | 27 | | | | | 20,000 | 400 |
| Croaker | | | | | | | 3,000 | 60 |
| Drum: | | | | | | | | |
| Black | 462 | 13 | | | | | 10,000 | 200 |
| Red or redfish | 57,022 | 1,742 | 603 | 30 | 160 | 6 | 15,000 | 300 |
| Eels | | | 16,000 | 800 | | | | |
| Flounders | 8,754 | 392 | | | 4,800 | 197 | | |
| Groupers | 379,742 | 11,390 | | | | | | |
| Grunts | 146 | 5 | | | | | | |
| Hickory shad | | | 29,616 | 888 | | | | |
| Jewfish | 1,655 | 50 | | | | | | |
| Kingfish or "king mackerel" | 101,268 | 5,524 | | | 22,000 | 1,980 | 500,000 | 25,000 |
| King whiting or "kingfish" | | | | | 3,250 | 97 | 10,000 | 300 |
| Mojarro | | | | | | | 20,000 | 600 |
| Mullet | 2,127,345 | 64,893 | 5,278 | 211 | 9,500 | 475 | | |
| Pigfish | 3,410 | 93 | | | | | | |
| Pinfish or sailors choice | | | | | 10,000 | 300 | | |
| Pompano | 27,272 | 4,969 | | | 3,200 | 640 | 40,000 | 8,000 |
| Porgies | 2,500 | 75 | | | | | | |
| Shad | | | 306,156 | 41,692 | 1,400 | 280 | | |
| Sheepshead | 27,683 | 1,085 | | | 5,540 | 322 | 30,000 | 1,200 |
| Snapper: | | | | | | | | |
| Mangrove | 8,170 | 300 | | | | | | |
| Red | 566,454 | 45,317 | | | 2,094 | 209 | | |
| Snook or sergeantfish | 15,631 | 426 | | | | | 40,000 | 1,600 |
| Spadefish | 220 | 6 | | | | | | |
| Spanish mackerel | 392,095 | 20,300 | | | 640 | 64 | 425,000 | 25,500 |
| Spot | 440 | 12 | | | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 8,767 | 259 | | | | | 15,000 | 1,200 |
| Spotted | 316,633 | 24,136 | | | 26,050 | 2,600 | | |
| Sunfish | | | 249,839 | 7,513 | | | | |
| Tenpounder | 7,150 | 195 | | | | | | |
| Crabs, stone | 145,050 | 9,670 | | | | | | |
| Sea crawfish or spiny lobster | | | | | 3,309 | 331 | | |
| Shrimp | | | | | 5,743,500 | 229,740 | 2,272,450 | 63,898 |
| Clams, hard, public | 4,848 | 727 | | | 4,152 | 778 | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | | | 972 | 60 | 10,371 | 1,120 |
| Market, public, fall | | | | | 2,269 | 140 | 10,195 | 1,155 |
| Scallops, bay | 15,295 | 1,657 | | | | | | |
| Terrapin, diamond-back | | | | | 406 | 83 | | |
| Turtles, soft-shell | | | 11,578 | 235 | | | | |
| Sponges: | | | | | | | | |
| Grass | 62,010 | 19,846 | | | | | | |
| Sheepswool | 319,945 | 795,578 | | | | | | |
| Wire | 3,291 | 1,931 | | | | | | |
| Yellow | 61,341 | 35,583 | | | | | | |
| Total | 4,793,081 | 1,053,187 | 2,706,617 | 148,417 | 5,847,592 | 238,737 | 3,451,016 | 133,383 |

| Species | Santa Rosa | | Sarasota | | Seminole | | Taylor | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bluefish | | | 25,839 | $1,879 | | | 8,580 | $312 |
| Blue runner or hardtail | | | 9,240 | 252 | | | | |
| Catfish and bullheads | | | | | 300,000 | $15,000 | | |
| Crevalle | | | 1,320 | 24 | | | | |
| Croaker | | | 3,850 | 70 | | | | |
| Drum: | | | | | | | | |
| Black | | | 1,100 | 22 | | | | |
| Red or redfish | 3,520 | $160 | 79,564 | 2,195 | | | 32,395 | 1,178 |
| Flounders | 9,262 | 840 | 4,125 | 182 | | | 1,650 | 90 |
| Groupers | | | 6,527 | 196 | | | | |

*Fisheries of Florida, 1930*—Continued

CATCH: BY COUNTIES—Continued

| Species | Santa Rosa | | Sarasota | | Seminole | | Taylor | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Grunts | | | 1,800 | $54 | | | | |
| Kingfish or "king mackerel" | | | 165,231 | 12,017 | | | | |
| Mullet | 143,800 | $4,314 | 1,521,895 | 45,657 | | | 360,100 | $14,404 |
| Permit | | | 550 | 15 | | | | |
| Pigfish | | | 7,490 | 217 | | | | |
| Pompano | | | 86,744 | 17,348 | | | 4,180 | 760 |
| Porgies | | | 900 | 27 | | | | |
| Shad | | | | | 295,000 | $35,400 | | |
| Sheepshead | 440 | 20 | 170,147 | 4,749 | | | 15,950 | 725 |
| Snapper, mangrove | | | 3,388 | 93 | | | 3,300 | 90 |
| Snook or sergeantfish | | | 19,912 | 543 | | | | |
| Spadefish | | | 1,320 | 36 | | | | |
| Spanish mackerel | | | 269,958 | 19,632 | | | 2,640 | 120 |
| Spot | | | 550 | 15 | | | 990 | 20 |
| Squeteagues or "sea trout": | | | | | | | | |
| Spotted | 4,180 | 380 | 169,217 | 12,298 | | | 108,446 | 7,587 |
| Clams, hard, public | | | 1,760 | 264 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 7,208 | 636 | | | | | | |
| Market, public, fall | 13,260 | 1,170 | | | | | | |
| Scallops, bay | | | 2,597 | 294 | | | | |
| Total | 181,670 | 7,520 | 2,555,024 | 118,079 | 595,000 | 50,400 | 538,231 | 25,286 |

| Species | Volusia | | Wakulla | | Walton | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Black bass | 2,400 | $240 | | | | |
| Bluefish | 400 | 40 | 14,960 | $408 | | |
| Blue runner or hardtail | | | 1,650 | 30 | | |
| Catfish and bullheads | 56,000 | 2,800 | | | | |
| Crappie | 6,200 | 372 | | | | |
| Crevalle | 5,200 | 156 | | | | |
| Croaker | 1,200 | 36 | 2,935 | 53 | | |
| Drum: | | | | | | |
| Black | 1,800 | 45 | | | | |
| Red or redfish | 7,816 | 292 | 33,137 | 1,004 | 1,650 | $75 |
| Flounders | 200 | 8 | 330 | 9 | 165 | 12 |
| King whiting or "kingfish" | 26,500 | 810 | | | 880 | 24 |
| Mullet | 281,800 | 8,754 | 1,750,729 | 52,522 | 90,400 | 2,712 |
| Pigfish | 20,466 | 409 | | | | |
| Pinfish or sailors choice | 3,740 | 77 | | | | |
| Pompano | 400 | 80 | | | 55 | 12 |
| Sheepshead | 1,100 | 44 | 11,188 | 421 | 1,320 | 60 |
| Snapper, mangrove | 400 | 24 | | | | |
| Spot | 4,100 | 120 | | | | |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 122,620 | 7,387 | | | | |
| Spotted | | | 155,502 | 11,309 | 11,275 | 820 |
| Sunfish | 18,000 | 540 | | | | |
| Crabs, hard | 19,800 | 396 | | | | |
| Shrimp | 2,463,400 | 86,536 | | | | |
| Clams: | | | | | | |
| Hard, public | 22,000 | 1,225 | | | | |
| Hard, private | 21,000 | 1,050 | | | | |
| Oysters: | | | | | | |
| Market, public, spring | 5,618 | 607 | 7,820 | 460 | | |
| Market, public, fall | 8,859 | 957 | 9,877 | 581 | | |
| Market, private, spring | 11,237 | 1,213 | | | | |
| Market, private, fall | 14,478 | 1,563 | | | | |
| Total | 3,126,734 | 115,781 | 1,988,128 | 66,797 | 105,745 | 3,715 |

*Fisheries of Florida, 1930*—Continued

CATCH: BY DISTRICTS

| Species | East Coast | | West Coast | | Lake Okeechobee | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Alewives | 365,732 | $5,486 | | | | |
| Amberjack | 2,720 | 111 | 18,500 | $556 | | |
| Black bass | 115,585 | 12,655 | | | 217,501 | $18,960 |
| Bluefish | 400,429 | 35,465 | 753,118 | 30,489 | | |
| Blue runner | 22,000 | 440 | 732,245 | 13,560 | | |
| Bonito | | | 1,190 | 24 | | |
| Cabio | | | 10,307 | 437 | | |
| Catfish and bullheads | 2,285,109 | 108,045 | 218,592 | 11,086 | 1,842,530 | 73,781 |
| Cero | 5,000 | 300 | 4,950 | 180 | | |
| Cigarfish | | | 58,412 | 1,752 | | |
| Crappie | 251,002 | 15,130 | | | 647,974 | 19,259 |
| Crevalle | 70,433 | 2,086 | 19,922 | 373 | | |
| Croaker | 14,300 | 378 | 18,720 | 357 | | |
| Dolphin | 5,000 | 500 | | | | |
| Drum: | | | | | | |
| Black | 25,915 | 663 | 8,709 | 230 | | |
| Red or redfish | 86,564 | 3,561 | 937,320 | 30,472 | | |
| Eels | 16,600 | 840 | 543 | 16 | | |
| Flounders | 10,996 | 464 | 108,615 | 5,788 | | |
| Groupers | 45,000 | 1,600 | 3,019,802 | 90,594 | | |
| Grunts | 7,000 | 210 | 14,883 | 447 | | |
| Hickory shad | 29,616 | 888 | | | | |
| Hogfish | 2,000 | 100 | | | | |
| Jewfish | 8,000 | 240 | 18,050 | 542 | | |
| Kingfish or "king mackerel" | 2,282,385 | 111,639 | 1,403,480 | 63,367 | | |
| King whiting or "kingfish" | 138,900 | 4,803 | 14,233 | 362 | | |
| Menhaden | 34,242,408 | 145,920 | 6,171,762 | 30,526 | | |
| Mojarro | 37,000 | 1,300 | 44,275 | 1,208 | | |
| Mullet | 2,903,567 | 79,566 | 19,118,239 | 589,902 | | |
| Muttonfish | 154,035 | 10,753 | 71,004 | 4,693 | | |
| Permit | | | 14,882 | 449 | | |
| Pigfish | 27,455 | 577 | 34,700 | 1,024 | | |
| Pinfish or sailors choice | 77,610 | 1,504 | 440 | 20 | | |
| Pompano | 135,726 | 29,920 | 437,627 | 81,796 | | |
| Porgies | 8,000 | 240 | 47,033 | 1,403 | | |
| Porkfish | | | 600 | 36 | | |
| Sea bass | 44,000 | 3,080 | 4,640 | 126 | | |
| Shad | 879,732 | 129,014 | | | | |
| Sharks | | | 2,187,500 | 3,500 | | |
| Sheepshead | 125,168 | 4,682 | 746,965 | 25,086 | | |
| Snapper: | | | | | | |
| Mangrove | 23,800 | 1,393 | 98,020 | 3,454 | | |
| Red or redfish | 34,030 | 2,912 | 5,001,672 | 424,228 | | |
| Snook or sergeantfish | 77,360 | 3,236 | 290,749 | 8,039 | | |
| Spadefish | | | 48,561 | 1,445 | | |
| Spanish mackerel | 2,028,137 | 113,369 | 4,112,080 | 180,806 | | |
| Spot | 130,068 | 3,690 | 12,488 | 322 | | |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 588,134 | 43,034 | 11,066 | 321 | | |
| Spotted | 79,621 | 7,956 | 2,710,945 | 194,585 | | |
| Sturgeon | 150 | 34 | 8,260 | 1,225 | | |
| Sunfish | 274,956 | 8,267 | | | 159,227 | 4,776 |
| Tenpounder | | | 181,361 | 5,213 | | |
| Tripletail | | | 4,869 | 168 | | |
| Turbot | | | 900 | 54 | | |
| Yellowtail | 40,000 | 8,200 | 49,470 | 3,471 | | |
| Crabs: | | | | | | |
| Hard | 107,200 | 3,986 | 4,095 | 117 | | |
| Stone | 103,000 | 12,800 | 204,550 | 13,830 | | |
| Sea crawfish or spiny lobster | 108,309 | 12,331 | 180,000 | 14,400 | | |
| Shrimp | 15,259,597 | 571,381 | 1,588,979 | 64,125 | | |
| Clams: | | | | | | |
| Hard, public | 26,152 | 2,003 | 661,736 | 42,537 | | |
| Hard, private | 23,688 | 1,890 | | | | |
| Conchs | | | 20,000 | 200 | | |
| Oysters: | | | | | | |
| Market, public, spring | 81,185 | 6,741 | 708,983 | 44,727 | | |
| Market, public, fall | 86,143 | 7,252 | 792,099 | 73,852 | | |
| Market, private, spring | 85,545 | 8,063 | | | | |
| Market, private, fall | 79,298 | 6,563 | | | | |
| Scallops, bay | | | 21,867 | 2,139 | | |
| Terrapin, diamond-back | 406 | 83 | | | | |
| Turtles: | | | | | | |
| Green | | | 21,550 | 1,078 | | |
| Soft-shell | 11,578 | 235 | | | | |

*Fisheries of Florida, 1930*—Continued

CATCH: BY DISTRICTS—Continued

| Species | East Coast | | West Coast | | Lake Okeechobee | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Sponges: | | | | | | |
| Grass | | | 82,918 | $26,556 | | |
| Sheepswool | | | 370,465 | 858,699 | | |
| Velvet | | | 682 | 409 | | |
| Wire | | | 3,781 | 2,041 | | |
| Yellow | | | 91,155 | 42,955 | | |
| Total | 64,023,344 | $1,527,579 | 53,524,560 | 3,001,397 | 2,867,232 | $116,776 |

*Industries related to the fisheries of Florida, 1930*

TRANSPORTING

| Item | Charlotte County | Collier County | Escambia County | Lee County | Levy County | Nassau County | Monroe County | Pinellas County | Total |
|---|---|---|---|---|---|---|---|---|---|
| Persons engaged: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 17 | 2 | 2 | 8 | 2 | | 13 | 7 | 51 |
| On boats | | | | | | 1 | | 46 | 47 |
| Total | 17 | 2 | 2 | 8 | 2 | 1 | 13 | 53 | 98 |
| Vessels: | | | | | | | | | |
| Motor— | | | | | | | | | |
| 5 to 10 tons | 2 | | | | 2 | | 1 | 2 | 7 |
| 11 to 20 tons | 3 | 1 | 1 | 3 | | | 4 | | 12 |
| 21 to 30 tons | | | | 1 | | | 1 | 1 | 3 |
| 31 to 40 tons | 1 | | | | | | 1 | | 2 |
| Total | 6 | 1 | 1 | 4 | 2 | | 7 | 3 | 24 |
| Net tonnage | 107 | 16 | 12 | 69 | 16 | | 124 | 35 | 379 |
| Sail— | | | | | | | | | |
| 5 to 10 tons | | | | | | | | 1 | 1 |
| 11 to 20 tons | | | | | | | 1 | 1 | 2 |
| Total | | | | | | | 1 | 2 | 3 |
| Net tonnage | | | | | | | 16 | 25 | 41 |
| Total vessels | 6 | 1 | 1 | 4 | 2 | | 8 | 5 | 27 |
| Total net tonnage | 107 | 16 | 12 | 69 | 16 | | 140 | 60 | 420 |
| Boats | | | | | | 3 | | 38 | 41 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Bay County | Brevard and Indian River Counties | Charlotte, Lee, and Collier Counties | Citrus and Pasco Counties | Clay County | Dade County | Duval County | Escambia and Okaloosa Counties |
|---|---|---|---|---|---|---|---|---|
| Establishments | 10 | 13 | 8 | 8 | 3 | 9 | 13 | 4 |
| Persons engaged: | | | | | | | | |
| Proprietors | 10 | 14 | 12 | 10 | 4 | 11 | 17 | 5 |
| Salaried employees | 3 | 3 | 9 | | | 5 | 18 | 9 |
| Wage earners— | | | | | | | | |
| Average for season | 19 | 27 | 59 | 28 | 6 | 18 | 158 | 37 |
| Average for year | 17 | 13 | 54 | 16 | 6 | 18 | 88 | 37 |
| Paid to salaried employees | $5,700 | $2,720 | $31,952 | | | $12,520 | $83,146 | $40,992 |
| Paid to wage earners | 13,092 | 9,610 | 45,856 | $7,740 | $3,280 | 24,240 | 79,404 | 31,597 |
| Total salaries and wages | 18,792 | 12,330 | 77,808 | 7,740 | 3,280 | 36,760 | 162,550 | 72,589 |

*Industries related to the fisheries of Florida, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

OPERATING UNITS, SALARIES, AND WAGES—Continued

| Item | Franklin County | Gulf County | Glades, Okeechobee, and Hendry Counties | Hillsborough County | Levy and Dixie Counties | Taylor and Wakulla Counties | Manatee County | Monroe County |
|---|---|---|---|---|---|---|---|---|
| Establishments | 21 | 4 | 6 | 6 | 7 | 4 | 7 | 12 |
| Persons engaged: | | | | | | | | |
| Proprietors | 24 | 4 | 6 | 8 | 9 | 6 | 11 | 11 |
| Salaried employees | 13 | 3 | 3 | 3 | 2 | ------- | ------- | 6 |
| Wage earners— | | | | | | | | |
| Average for season | 465 | 42 | 14 | 7 | 16 | 7 | 9 | 52 |
| Average for year | 150 | 23 | 12 | 7 | 16 | 7 | 8 | 37 |
| Paid to salaried employees | $24,320 | $9,000 | $3,560 | $5,844 | $2,400 | ------- | $6,160 | $15,240 |
| Paid to wage earners | 69,093 | 17,415 | 7,240 | 4,910 | 8,834 | $4,510 | 5,890 | 34,858 |
| Total salaries and wages | 93,413 | 26,415 | 10,800 | 10,754 | 11,234 | 4,510 | 12,050 | 50,098 |

| Item | Nassau County | Palm Beach County | Pinellas County | Putnam and St. Johns Counties | Sarasota County | St. Lucie County | Volusia and Seminole Counties | Total |
|---|---|---|---|---|---|---|---|---|
| Establishments | 7 | 12 | 25 | 16 | 3 | 11 | 14 | 223 |
| Persons engaged: | | | | | | | | |
| Proprietors | 11 | 20 | 39 | 15 | 3 | 13 | 16 | 279 |
| Salaried employees | 6 | 4 | 5 | 7 | 2 | 3 | ------- | 104 |
| Wage earners— | | | | | | | | |
| Average for season | 411 | 15 | 77 | 282 | 10 | 42 | 11 | 1,812 |
| Average for year | 177 | 15 | 53 | 63 | 10 | 22 | 8 | 857 |
| Paid to salaried employees | $30,086 | $4,100 | $31,572 | $10,568 | $2,900 | $5,100 | ------- | $327,880 |
| Paid to wage earners | 95,375 | 12,380 | 35,651 | 28,099 | 7,646 | 15,250 | $4,748 | 566,718 |
| Total salaries and wages | 125,461 | 16,480 | 67,223 | 38,667 | 10,546 | 20,350 | 4,748 | 894,598 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Menhaden products: | | |
| Acid scrap ... tons | 2,782 | $71,250 |
| Dry scrap ... do | 4,736 | 230,241 |
| Meal ... do | 7,142 | 368,637 |
| Oil ... gallons | 481,948 | 94,064 |
| Mullet: | | |
| Dry-salted ... pounds | 370,067 | 19,199 |
| Roe, salted ... do | 29,084 | 7,920 |
| Spanish mackerel, dry-salted ... do | 70,100 | 5,155 |
| Shrimp, canned ... standard cases | 69,372 | 491,231 |
| Oysters, fresh-shucked ... gallons | 134,731 | 203,327 |
| Unclassified products: | | |
| Fresh and frozen fillets [1] ... pounds | 79,499 | 16,626 |
| Fresh and frozen steaks and sticks [2] ... do | 163,428 | 22,049 |
| Other fresh packaged and salted [3] | (4) | 4,670 |
| Canned [5] | (4) | 228,322 |
| By-products [6] | (4) | 233,060 |
| Total | ------- | 1,995,751 |

[1] Includes fresh fillets of snook, groupers, and red snapper; frozen fillets of amberjack, bluefish, flounders, groupers, mullet, Spanish mackerel, and red snapper.
[2] Includes fresh and frozen amberjack, grouper, and red snapper steaks; and frozen red snapper fish sticks.
[3] Includes fresh-cooked crab meat; fresh-shucked hard clams, conchs and bay scallops; and salted bluefish.
[4] Data not available.
[5] Includes canned hard clam products, oysters, and green turtle meat and soup.
[6] Includes oyster-shell products; shark hides, fins, teeth, and oil; fish scrap; shrimp meal; and novelties made from shells and fish scales.

*Industries related to the fisheries of Florida, 1930*—Continued

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 240]

| Item | | Quantity | Value |
|---|---|---|---|
| Mullet: | | | |
| Dry-salted | pounds | 471,600 | $23,496 |
| Roe, dry-salted | do | 43,200 | 10,800 |
| Sturgeon roe, fresh | do | 10 | 5 |
| Crab meat, packaged (fresh-cooked) | do | 600 | 210 |
| Oysters, fresh-shucked | gallons | 6,143 | 8,548 |
| Scallops, bay, fresh-shucked | do | 2,247 | 3,218 |
| Total | | | 46,277 |

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 47 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 228 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Sponge fishery of Florida, 1930*

OPERATING UNITS: BY GEAR

| Item | Sponge hooks | Diving outfits | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Fishermen on boats and shore, regular | 334 | 412 | 746 |
| Boats: | | | |
| Motor | | 55 | 55 |
| Other | 283 | | 283 |
| Apparatus | 283 | 55 | |

CATCH: BY GEAR

| Sponges | Sponge hooks | | Diving outfits | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Grass | 76,718 | $24,572 | 6,200 | $1,984 | 82,918 | $26,556 |
| Sheepswool | 98,513 | 182,458 | 271,952 | 676,241 | 370,465 | 858,699 |
| Velvet | 682 | 409 | | | 682 | 409 |
| Wire | 490 | 110 | 3,291 | 1,931 | 3,781 | 2,041 |
| Yellow | 39,015 | 12,709 | 52,140 | 30,246 | 91,155 | 42,955 |
| Total | 215,418 | 220,258 | 333,583 | 710,402 | 549,001 | 930,660 |

SPONGES SOLD AT THE EXCHANGE, TARPON SPRINGS, FLA.

During 1931 sponges handled on the exchange at Tarpon Springs, Fla., amounted to 372,771 pounds, valued at $609,773. This is a decrease of 10 per cent in quantity and 24 per cent in value as compared with the quantity and value of the transactions on the exchange during 1930. A large part of this decrease may be attributed to the fact that there was an unusually large hold over on January 1, 1932.

It is estimated that the value of sponges sold outside the exchange during 1931 amounted to $40,000. Of the total sponges sold on the exchange in 1931, 168,820 pounds, valued at $522,156, were large wool; 30,837 pounds, valued at $24,670, were small wool; 97,742 pounds, valued at $39,096, were yellow; 62,982 pounds, valued at $18,895, were grass; and 12,390 pounds, valued at $4,956, were wire sponges.

## ALABAMA

*Fisheries of Alabama, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Lines | | | |
|---|---|---|---|---|---|---|
| | | | Hand | Troll | Trot, with baits or snoods | Trot, with hooks |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 6 | 16 | 96 | | | |
| On boats and shore— | | | | | | |
| Regular | 39 | 84 | 32 | 4 | 5 | 34 |
| Casual | | 4 | 21 | | 9 | |
| Total | 45 | 104 | 149 | 4 | 14 | 34 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | 1 | 4 | 3 | | | |
| 11 to 20 tons | | | 7 | | | |
| 61 to 70 tons | | | 1 | | | |
| Total | 1 | 4 | 11 | | | |
| Net tonnage | 9 | 32 | 186 | | | |
| Boats: | | | | | | |
| Motor | 11 | 32 | 6 | 2 | | 4 |
| Other | 3 | 77 | 14 | | 14 | 34 |
| Accessory boats | 1 | 12 | | | | |
| Apparatus: | | | | | | |
| Number | 8 | 84 | 149 | 2 | 14 | 177 |
| Length, yards | 5,900 | | | | | |
| Square yards | | 28,692 | | | | |
| Hooks, baits, or snoods | | | 271 | 2 | 2,475 | 17,900 |

| Item | Fyke nets | Otter trawls, shrimp | Spears | Tongs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 30 | | | | 142 |
| On boats and shore— | | | | | | |
| Regular | 29 | 246 | 4 | 112 | 14 | 469 |
| Casual | | | 17 | 4 | 18 | 55 |
| Total | 29 | 276 | 21 | 116 | 32 | 666 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | | 14 | | | | 21 |
| 11 to 20 tons | | 1 | | | | 8 |
| 61 to 70 tons | | | | | | 1 |
| Total | | 15 | | | | 30 |
| Net tonnage | | 117 | | | | 335 |
| Boats: | | | | | | |
| Motor | 4 | 123 | | 47 | | 185 |
| Other | 29 | | | 41 | | 183 |
| Accessory boats | | | | | | 13 |
| Apparatus: | | | | | | |
| Number | 119 | 138 | 21 | 116 | | |
| Yards at mouth | | 1,800 | | | | |

*Fisheries of Alabama, 1930*—Continued

CATCH: BY GEAR

| Species | Haul seines | | Trammel nets | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hand | | Troll | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | 12,749 | $558 | 7,905 | $368 | | | | |
| Bluerunner or hardtail | 2,205 | 63 | | | | | | |
| Cabio | | | | | | | 2,200 | $100 |
| Catfish and bullheads | 1,105 | 51 | 9,644 | 474 | 1,375 | $100 | | |
| Crevalle | 2,558 | 70 | | | | | | |
| Croaker | 2,403 | 78 | 4,940 | 165 | 104 | 4 | | |
| Drum: | | | | | | | | |
| Black | 6,796 | 335 | 4,787 | 229 | 110 | 5 | | |
| Red or redfish | 44,733 | 3,012 | 55,520 | 2,884 | 4,081 | 211 | | |
| Flounders | | | 11,233 | 783 | | | | |
| Groupers | | | | | 177,945 | 5,338 | | |
| Jewfish | | | | | 5,021 | 151 | | |
| King whiting or "kingfish" | 2,520 | 95 | 2,838 | 88 | 440 | 16 | | |
| Mullet | 757,220 | 29,332 | 1,448,158 | 56,675 | | | | |
| Pompano | 171 | 33 | 4,891 | 757 | | | | |
| Sheepshead, salt-water | 8,552 | 499 | 7,741 | 420 | 1,276 | 69 | | |
| Snapper, red | | | | | 847,918 | 67,833 | | |
| Spadefish | | | 110 | 3 | | | | |
| Spanish mackerel | 484 | 48 | 5,324 | 290 | | | | |
| Spot | 635 | 21 | 926 | 45 | | | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 207 | 10 | 5,940 | 216 | 440 | 20 | | |
| Spotted | 13,769 | 1,157 | 86,374 | 6,578 | 5,838 | 533 | | |
| Sturgeon | 1,816 | 297 | | | | | | |
| Tenpounder | 5,369 | 215 | | | | | | |
| Tripletail | | | 55 | 2 | 220 | 11 | | |
| Total | 863,292 | 35,874 | 1,656,386 | 69,977 | 1,044,768 | 74,291 | 2,200 | 100 |

| Species | Lines—Continued | | | | Fyke nets | | Otter trawls, shrimp | |
|---|---|---|---|---|---|---|---|---|
| | Trot, with baits or snoods | | Trot, with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Buffalofish | | | 61,176 | $3,339 | 39,679 | $2,164 | | |
| Catfish and bullheads | | | 48,428 | 3,265 | 30,352 | 2,111 | | |
| Paddlefish | | | 2,251 | 125 | | | | |
| Crabs, hard | 79,968 | $1,142 | | | | | 2,982,200 | $97,219 |
| Shrimp | | | | | | | | |
| Total | 79,968 | 1,142 | 111,855 | 6,729 | 70,031 | 4,275 | 2,982,200 | 97,219 |

| Species | Spears | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | 12,947 | $1,177 | | | | |
| Crabs, soft | | | | | 780 | $195 |
| Oysters: | | | | | | |
| Market, public, spring | | | 40,144 | $3,755 | | |
| Market, public, fall | | | 225,506 | 17,723 | | |
| Market, private, spring | | | 4,080 | 480 | | |
| Market, private, fall | | | 17,064 | 1,896 | | |
| Terrapin, diamond-back | | | | | 2,018 | 635 |
| Total | 12,947 | 1,177 | 286,794 | 23,854 | 2,798 | 830 |

OPERATING UNITS: BY COUNTIES

| Item | Baldwin | Mobile |
|---|---|---|
| | *Number* | *Number* |
| Fishermen: | | |
| On vessels | 6 | 136 |
| On boats and shore— | | |
| Regular | 68 | 401 |
| Casual | 14 | 41 |
| Total | 88 | 578 |

*Fisheries of Alabama, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Baldwin | Mobile |
|---|---|---|
| Vessels, motor: | *Number* | *Number* |
| 5 to 10 tons | 2 | 19 |
| 11 to 20 tons | | 8 |
| 61 to 70 tons | | 1 |
| Total | 2 | 28 |
| Net tonnage | 16 | 319 |
| Boats: | | |
| Motor | 26 | 159 |
| Other | 43 | 140 |
| Accessory boats | 2 | 11 |
| Apparatus: | | |
| Haul seines | 1 | 7 |
| Length, yards | 500 | 5,400 |
| Trammel nets | 36 | 48 |
| Square yards | 13,285 | 15,407 |
| Lines— | | |
| Hand | 9 | 140 |
| Hooks | 9 | 262 |
| Troll | 2 | |
| Hooks | 2 | |
| Trot, with baits or snoods | | 14 |
| Baits or snoods | | 2,475 |
| Trot, with hooks | 2 | 175 |
| Hooks | 400 | 17,500 |
| Fyke nets | | 119 |
| Otter trawls, shrimp | 7 | 131 |
| Yards at mouth | 90 | 1,710 |
| Spears | 7 | 14 |
| Tongs | 19 | 97 |

CATCH: BY COUNTIES

| Species | Baldwin | | Mobile | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Bluefish | 9,398 | $365 | 11,256 | $561 |
| Blue runner or hardtail | 825 | 22 | 1,380 | 41 |
| Buffalofish | | | 100,855 | 5,503 |
| Cabio | 2,200 | 100 | | |
| Catfish and bullheads | 9,193 | 481 | 81,711 | 5,520 |
| Crevalle | 330 | 9 | 2,228 | 61 |
| Croaker | 2,877 | 96 | 4,570 | 151 |
| Drum: | | | | |
| Black | 1,318 | 60 | 10,375 | 509 |
| Red or redfish | 30,674 | 1,518 | 73,660 | 4,589 |
| Flounders | 5,390 | 385 | 18,790 | 1,575 |
| Groupers | | | 177,945 | 5,338 |
| Jewfish | | | 5,021 | 151 |
| King whiting or "kingfish" | 1,650 | 45 | 4,148 | 154 |
| Mullet | 716,461 | 28,425 | 1,488,917 | 57,582 |
| Paddlefish | | | 2,251 | 125 |
| Pompano | 4,061 | 662 | 1,001 | 128 |
| Sheepshead, salt water | 3,740 | 204 | 13,829 | 784 |
| Snapper, red | | | 847,918 | 67,833 |
| Spadefish | | | 110 | 3 |
| Spanish mackerel | 4,444 | 242 | 1,364 | 96 |
| Spot | 1,012 | 47 | 549 | 19 |
| Squeteagues or "sea trout": | | | | |
| Gray | | | 6,587 | 246 |
| Spotted | 32,009 | 2,405 | 73,972 | 5,863 |
| Sturgeon | 1,816 | 297 | | |
| Tenpounder | | | 5,369 | 215 |
| Tripletail | 55 | 2 | 220 | 11 |
| Crabs: | | | | |
| Hard | | | 79,968 | 1,142 |
| Soft | | | 780 | 195 |
| Shrimp | 168,400 | 5,490 | 2,818,800 | 91,729 |
| Oysters: | | | | |
| Market, public, spring | 3,570 | 315 | 36,574 | 3,440 |
| Market, public, fall | 10,761 | 949 | 214,745 | 16,774 |
| Market, private, spring | | | 4,080 | 480 |
| Market, private, fall | 17,064 | 1,896 | | |
| Terrapin, diamond-back | 1,142 | 416 | 876 | 219 |
| Total | 1,028,390 | 44,431 | 6,084,849 | 271,037 |

*Industries related to the fisheries of Alabama, 1930*

TRANSPORTING

| Item | Baldwin County | Mobile County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged: | | | |
| On vessels | 6 | 6 | 12 |
| On boats | | 18 | 18 |
| Total | 6 | 24 | 30 |
| Vessels, motor: | | | |
| 5 to 10 tons | 2 | 3 | 5 |
| 11 to 20 tons | 1 | | 1 |
| Total | 3 | 3 | 6 |
| Net tonnage | 33 | 22 | 55 |
| Boats | | 3 | 3 |

WHOLESALE AND MANUFACTURING IN BALDWIN AND MOBILE COUNTIES

OPERATING UNITS, SALARIES, AND WAGES

| | |
|---|---|
| Establishments | 21 |
| Persons engaged: | |
| Proprietors | 31 |
| Salaried employees | 16 |
| Wage earners— | |
| Average for season | 492 |
| Average for year | 218 |
| Paid to salaried employees | $52, 105 |
| Paid to wage earners | 86, 135 |
| Total salaries and wages | 138, 240 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Mullet, dry-salted | pounds | 45, 000 | $2, 450 |
| Shrimp, canned | standard cases | 43, 942 | 246, 768 |
| Oysters, fresh-shucked | gallons | 15, 209 | 18, 295 |
| Miscellaneous [1] | | (2) | 62, 477 |
| Total | | | 329, 990 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 46]

| | | | |
|---|---|---|---|
| Sturgeon roe, fresh | pounds | 32 | $19 |
| Oysters, fresh-shucked | gallons | 7, 259 | 7, 680 |
| Total | | | 7, 699 |

[1] Includes frozen red snapper fillets; salted mullet roe; cooked shrimp; canned oysters; dry shrimp hulls; and oyster-shell products.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 18 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 42 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## MISSISSIPPI

*Fisheries of Mississippi, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Trammel nets | Lines | | Dip nets, drop | Cast nets |
|---|---|---|---|---|---|---|
| | | | Hand | Trot, with baits or snoods | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 16 | | | |
| On boats and shore— | | | | | | |
| Regular | 272 | 96 | 37 | 54 | 2 | |
| Casual | | 6 | 114 | 12 | 32 | 54 |
| Total | 272 | 102 | 167 | 66 | 34 | 54 |
| Vessels: | | | | | | |
| Motor— | | | | | | |
| 5 to 10 tons | | | 1 | | | |
| 11 to 20 tons | | | 1 | | | |
| Total | | | 2 | | | |
| Net tonnage | | | 25 | | | |
| Boats: | | | | | | |
| Motor | 45 | 34 | 15 | 9 | 1 | |
| Other | 30 | 51 | 104 | 60 | 14 | |
| Apparatus: | | | | | | |
| Number | 45 | 55 | 167 | 66 | 232 | 54 |
| Length, yards | 9,220 | | | | | |
| Square yards | | 17,785 | | | | |
| Hooks, baits, or snoods | | | 201 | 20,795 | | |

| Item | Otter trawls, shrimp | Spears | Dredges, oyster | Tongs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 225 | | 530 | | | 555 |
| On boats and shore— | | | | | | |
| Regular | 598 | 8 | 380 | 440 | | 1,355 |
| Casual | 9 | 68 | | | 31 | 193 |
| Total | 832 | 76 | 910 | 440 | 31 | 2,103 |
| Vessels: | | | | | | |
| Motor— | | | | | | |
| 5 to 10 tons | 35 | | 41 | | | 44 |
| 11 to 20 tons | 26 | | 67 | | | 69 |
| 21 to 30 tons | 3 | | 10 | | | 11 |
| 31 to 40 tons | | | 1 | | | 1 |
| Total | 64 | | 119 | | | 125 |
| Net tonnage | 711 | | 1,600 | | | 1,678 |
| Sail— | | | | | | |
| 5 to 10 tons | | | 1 | | | 1 |
| 11 to 20 tons | | | 4 | | | 4 |
| Total | | | 5 | | | 5 |
| Net tonnage | | | 66 | | | 66 |
| Total vessels | 64 | | 124 | | | 130 |
| Total net tonnage | 711 | | 1,666 | | | 1,744 |
| Boats: | | | | | | |
| Motor | 408 | | 95 | 30 | | 401 |
| Other | | | | 406 | | 615 |
| Apparatus: | | | | | | |
| Number | 363 | 76 | 437 | 440 | | |
| Yards at mouth | 4,607 | | 443 | | | |

*Fisheries of Mississippi, 1930*—Continued

CATCH: BY GEAR

| Species | Haul seines | | Trammel nets | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hand | | Trot, with baits or snoods | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | 19,191 | $1,047 | | | | |
| Buffalofish | | | | | 14,969 | $680 | | |
| Cabio or crab eater | | | 1,100 | 60 | 737 | 38 | | |
| Catfish and bullheads | | | 38,146 | 1,734 | 23,276 | 1,058 | | |
| Crevalle | | | 9,847 | 269 | 110 | 3 | | |
| Croaker | | | 6,105 | 221 | 5,170 | 176 | | |
| Drum: | | | | | | | | |
| Black | | | 19,270 | 901 | 1,485 | 71 | | |
| Red or redfish | | | 112,972 | 6,227 | 9,058 | 494 | | |
| Flounders | | | 31,886 | 2,542 | | | | |
| Groupers | | | | | 71,093 | 2,133 | | |
| Jewfish | | | | | 1,274 | 38 | | |
| King whiting or "kingfish" | | | 5,604 | 183 | | | | |
| Mullet | | | 790,735 | 31,629 | | | | |
| Pompano | | | 791 | 228 | | | | |
| Sheepshead, salt-water | | | 28,509 | 1,625 | 1,568 | 86 | | |
| Snapper, red | | | | | 188,725 | 15,875 | | |
| Spanish mackerel | | | 1,027 | 71 | 328 | 17 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 58,591 | 1,953 | 48,576 | 1,767 | | |
| Spotted | | | 79,612 | 7,381 | 45,500 | 4,963 | | |
| Sturgeon | | | 73 | 22 | | | | |
| Tenpounder | | | 4,725 | 142 | | | | |
| Tripletail | | | 1,540 | 124 | 997 | 55 | | |
| Crabs, hard | | | | | | | 574,679 | $9,720 |
| Shrimp | 104,400 | $3,915 | | | | | | |
| Total | 104,400 | 3,915 | 1,209,724 | 56,359 | 412,866 | 27,454 | 574,679 | 9,720 |

| Species | Dip nets, drop | | Cast nets | | Otter trawls, shrimp | | Spears | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounder | | | | | 8,855 | $805 | 28,248 | $2,654 |
| Mullet | | | 11,020 | $491 | | | | |
| Sheepshead, salt-water | | | 440 | 24 | | | | |
| Crabs, hard | 98,602 | $1,409 | | | 8,378,080 | 314,164 | | |
| Shrimp | | | 6,570 | 792 | | | | |
| Total | 98,602 | 1,409 | 18,030 | 1,307 | 8,386,935 | 314,969 | 28,248 | 2,654 |

| Species | Dredges, oyster | | Tongs | | By hand | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, soft | | | | | 5,800 | $1,740 |
| Oysters: | | | | | | |
| Market, public, spring, Mississippi | 1,913,904 | $125,508 | 280,182 | $18,718 | | |
| Market, public, fall, Mississippi | 68,820 | 4,313 | 171,794 | 12,380 | | |
| Market, public, spring, Louisiana | 1,695,860 | 111,209 | 69,244 | 4,626 | | |
| Market, public, fall, Louisiana | 673,832 | 42,224 | 22,610 | 1,629 | | |
| Total | 4,352,416 | 283,254 | 543,830 | 37,353 | 5,800 | 1,740 |

OPERATING UNITS: BY COUNTIES

| Item | Hancock | Harrison | Jackson |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Fishermen: | | | |
| On vessels | | 524 | 31 |
| On boats and shore— | | | |
| Regular | 41 | 1,126 | 188 |
| Casual | 38 | 107 | 48 |
| Total | 79 | 1,757 | 267 |

*Fisheries of Mississippi, 1930*—Continued

OPERATING UNITS: BY COUNTIES—Continued

| Item | Hancock | Harrison | Jackson |
|---|---|---|---|
| Vessels: | | | |
| Motor— | *Number* | *Number* | *Number* |
| 5 to 10 tons | | 43 | 1 |
| 11 to 20 tons | | 66 | 3 |
| 21 to 30 tons | | 9 | 2 |
| 31 to 40 tons | | 1 | |
| Total | | 119 | 6 |
| Net tonnage | | 1,573 | 105 |
| Sail— | | | |
| 5 to 10 tons | | 1 | |
| 11 to 20 tons | | 4 | |
| Total | | 5 | |
| Net tonnage | | 66 | |
| Total vessels | | 124 | 6 |
| Total net tonnage | | 1,639 | 105 |
| Boats: | | | |
| Motor | 17 | 322 | 62 |
| Other | 47 | 467 | 101 |
| Apparatus: | | | |
| Haul seines | | 44 | 1 |
| Length, yards | | 9,020 | 200 |
| Trammel nets | 9 | 22 | 24 |
| Square yards | 3,006 | 8,354 | 6,425 |
| Lines— | | | |
| Hand | 26 | 67 | 74 |
| Hooks | 26 | 67 | 108 |
| Trot, with baits or snoods | | 56 | 10 |
| Baits or snoods | | 19,345 | 1,450 |
| Dip nets, drop | 232 | | |
| Cast nets | | 50 | 4 |
| Otter trawls, shrimp | | 321 | 42 |
| Yards at mouth | | 4,084 | 523 |
| Spears | 9 | 51 | 16 |
| Dredges, oyster | | 429 | 8 |
| Yards at mouth | | 435 | 8 |
| Tongs | 17 | 370 | 53 |

CATCH: BY COUNTIES

| Species | Hancock | | Harrison | | Jackson | |
|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | 19,191 | $1,047 |
| Buffalofish | | | | | 14,969 | 680 |
| Cabio or crab eater | | | 1,837 | $98 | | |
| Catfish and bullheads | 7,920 | $360 | 37,818 | 1,719 | 15,684 | 713 |
| Crevalle | | | 330 | 9 | 9,627 | 263 |
| Croaker | 550 | 20 | 5,115 | 181 | 5,610 | 196 |
| Drum: | | | | | | |
| Black | 4,620 | 168 | 9,119 | 436 | 7,016 | 368 |
| Red or redfish | 16,830 | 918 | 43,510 | 2,373 | 61,690 | 3,430 |
| Flounders | 13,575 | 1,124 | 38,665 | 3,413 | 16,749 | 1,464 |
| Groupers | | | | | 71,093 | 2,133 |
| Jewfish | | | | | 1,274 | 38 |
| King whiting or "kingfish" | 550 | 15 | 3,685 | 122 | 1,369 | 46 |
| Mullet | 48,500 | 1,940 | 86,789 | 3,521 | 666,466 | 26,659 |
| Pompano | | | 165 | 45 | 626 | 183 |
| Sheepshead, salt-water | 4,950 | 270 | 5,198 | 284 | 20,369 | 1,181 |
| Snapper, red | | | | | 188,725 | 15,875 |
| Spanish mackerel | 480 | 28 | 248 | 13 | 627 | 47 |
| Squeteagues or "sea trout": | | | | | | |
| Gray | 26,850 | 798 | 37,356 | 1,360 | 42,961 | 1,562 |
| Spotted | 35,310 | 3,423 | 43,917 | 4,394 | 45,885 | 4,527 |
| Sturgeon | | | | | 73 | 22 |
| Tenpounder | | | | | 4,725 | 142 |
| Tripletail | 440 | 24 | 1,155 | 76 | 942 | 79 |
| Crabs: | | | | | | |
| Hard | 98,602 | 1,409 | 501,249 | 8,646 | 73,430 | 1,074 |
| Soft | 1,320 | 396 | 4,480 | 1,344 | | |
| Shrimp | | | 7,888,830 | 296,231 | 600,220 | 22,640 |
| Oysters: | | | | | | |
| Market, public, spring, Mississippi | 31,990 | 2,856 | 1,981,886 | 129,110 | 135,982 | 9,893 |
| Market, public, fall, Mississippi | 57,120 | 4,896 | 134,858 | 8,474 | 48,636 | 3,414 |
| Market, public, spring, Louisiana | | | 1,765,776 | 115,033 | 43,556 | 3,169 |
| Market, public, fall, Louisiana | | | 696,442 | 43,762 | | |
| Total | 349,607 | 18,645 | 13,288,428 | 620,644 | 2,097,495 | 100,845 |

*Industries related to the fisheries of Mississippi, 1930*

TRANSPORTING IN HARRISON COUNTY

| | |
|---|---|
| Persons engaged on boats | 26 |
| Boats | 13 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Hancock and Harrison Counties | Jackson County | Total |
|---|---|---|---|
| Establishments | 45 | 8 | 53 |
| Persons engaged: | | | |
| Proprietors | 60 | 12 | 72 |
| Salaried employees | 29 | 8 | 37 |
| Wage earners— | | | |
| Average for season | 2,375 | 171 | 2,546 |
| Average for year | 1,004 | 52 | 1,056 |
| Paid to salaried employees | $95,176 | $11,085 | $106,261 |
| Paid to wage earners | 350,934 | 18,497 | 369,431 |
| Total salaries and wages | 446,110 | 29,582 | 475,692 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Crab meat, packaged (fresh-cooked) ... pounds | 57,150 | $16,810 |
| Shrimp: | | |
| Packaged, cooked, and peeled ... do | 193,145 | 59,594 |
| Canned— | | |
| Wet in tins and glass ... standard cases | 61,273 | 336,035 |
| Dry in tins ... do | 45,904 | 268,290 |
| Oysters: | | |
| Fresh-shucked ... gallons | 83,404 | 125,136 |
| Canned ... standard cases | 224,921 | 1,034,362 |
| Shell products— | | |
| Poultry feed ... tons | 38,663 | 270,641 |
| Lime ... do | 7,733 | 5,126 |
| Miscellaneous [1] | (2) | 25,125 |
| Total | | 2,141,119 |

FISHERMEN'S PREPARED PRODUCTS

[Number of persons engaged, 61]

| | | |
|---|---|---|
| Oysters, fresh-shucked ... gallons | 7,446 | $9,658 |

[1] Includes salted mullet, canned shrimp gumbo soup, and shrimp meal.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 26 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 57 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## LOUISIANA

### *Fisheries of Louisiana, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets, run-around | Trammel nets | Lines | | |
|---|---|---|---|---|---|---|
| | | | | Hand | Trot, with baits or snoods | Trot, with hooks |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On boats and shore— | | | | | | |
| Regular | 608 | 2 | 98 | 61 | 201 | 3 |
| Casual | 47 | | 2 | 86 | 87 | |
| Total | 655 | 2 | 100 | 147 | 288 | 3 |
| Boats: | | | | | | |
| Motor | 129 | 1 | 45 | 28 | 25 | 3 |
| Other | 177 | 1 | 51 | 100 | 259 | |
| Apparatus: | | | | | | |
| Number | 138 | 1 | 50 | 147 | 288 | 3 |
| Length, yards | 27,875 | | | | | |
| Square yards | | 30 | 13,712 | | | |
| Hooks, baits, or snoods | | | | 152 | 58,370 | 300 |

| Item | Dip nets, drop | Cast nets | Otter trawls, shrimp | Dredges, clam | Tongs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 249 | 147 | | | 370 |
| On boats and shore— | | | | | | | |
| Regular | 8 | 3 | 1,650 | 14 | 524 | 125 | 2,775 |
| Casual | 15 | | | | 2 | 94 | 238 |
| Total | 23 | 3 | 1,899 | 161 | 526 | 219 | 3,383 |
| Vessels, motor; | | | | | | | |
| 5 to 10 tons | | | 107 | 30 | | | 133 |
| 11 to 20 tons | | | 8 | 10 | | | 15 |
| Total vessels | | | 115 | 40 | | | 148 |
| Total net tonnage | | | 780 | 370 | | | 1,074 |
| Boats: | | | | | | | |
| Motor | 11 | | 825 | 4 | 3 | | 997 |
| Other | 21 | | | | 523 | | 1,073 |
| Apparatus: | | | | | | | |
| Number | 1,700 | 3 | 940 | 72 | 526 | | |
| Yards at mouth | | | 12,213 | 72 | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets, runaround | | Trammel nets | | Lines—Hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 24,400 | $856 | | | 35,443 | $1,199 | 27,700 | $1,030 |
| Crevalle | | | | | 165 | 15 | | |
| Croaker | 29,860 | 1,972 | | | 25,903 | 1,905 | 4,100 | 328 |
| Drum: | | | | | | | | |
| Black | 31,013 | 1,255 | | | 91,423 | 3,463 | 44,000 | 1,733 |
| Red or redfish | 65,322 | 5,017 | | | 176,640 | 13,776 | 92,920 | 7,166 |
| Flounders | 5,030 | 481 | | | 18,037 | 1,602 | | |
| Garfish | | | | | 1,320 | 120 | | |
| Groupers | | | | | | | 3,500 | 105 |
| Jewfish | | | | | | | 6,000 | 180 |
| King whiting or "kingfish" | 21,450 | 675 | | | 32,917 | 1,029 | | |
| Mullet | 7,809 | 269 | | | 110 | 10 | | |
| Pompano | | | | | 1,112 | 301 | | |
| Sharks | | | | | | | 300,000 | 1,400 |
| Sheepshead, salt-water | 19,430 | 1,150 | | | 65,994 | 3,818 | 16,700 | 1,025 |
| Snapper, red | | | | | | | 76,400 | 6,112 |
| Spanish mackerel | | | | | | | 1,800 | 108 |
| Spot | 6,000 | 179 | | | 3,704 | 111 | | |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 68,150 | 2,106 | | | 164,379 | 4,943 | 90,800 | 2,760 |
| Spotted | 73,093 | 8,529 | 151 | $14 | 204,357 | 23,536 | 109,500 | 13,785 |
| Tripletail | | | | | 5,301 | 455 | | |
| Shrimp | 677,810 | 21,624 | | | | | | |
| Turtles, loggerhead | 50,050 | 1,052 | | | | | | |
| Total | 1,079,417 | 45,615 | 151 | 14 | 826,805 | 56,283 | 773,420 | 35,732 |

*Fisheries of Louisiana, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Lines—Continued | | | | Dip nets, drop | | Cast nets | |
|---|---|---|---|---|---|---|---|---|
| | Trot, with baits or snoods | | Trot, with hooks | | | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | | | 1,600 | $128 | | | | |
| Mullet | | | | | | | 1,053 | $32 |
| Crabs, hard | 4,044,995 | $60,637 | | | 141,000 | $2,820 | | |
| Total | 4,044,995 | 60,637 | 1,600 | 128 | 141,000 | 2,820 | 1,053 | 32 |

| Species | Otter trawls, shrimp | | Dredges, oyster | | Tongs | | By hand | |
|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Crabs, soft | | | | | | | 145,732 | $58,068 |
| Shrimp | 37,986,677 | $1,138,002 | | | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 266,664 | $11,111 | 4,800 | $640 | | |
| Market, public, fall | | | 342,708 | 18,932 | 63,960 | 6,008 | | |
| Market, private, spring | | | 184,800 | 9,748 | 1,613,032 | 191,909 | | |
| Market, private, fall | | | 639,884 | 80,026 | 1,730,452 | 231,672 | | |
| Terrapin, diamond-back | | | | | | | 38,750 | 12,980 |
| Total | 37,986,677 | 1,138,002 | 1,434,056 | 119,817 | 3,412,244 | 430,229 | 184,482 | 71,048 |

OPERATING UNITS: BY PARISHES

| Item | Cameron | Iberia | Jefferson Davis | Jefferson | La Fourche | Orleans |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 20 | 95 | 57 |
| On boats and shore— | | | | | | |
| Regular | 9 | 14 | 4 | 721 | 568 | 158 |
| Casual | | 10 | | 40 | 2 | 19 |
| Total | 9 | 24 | 4 | 781 | 665 | 234 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | | | | 8 | 44 | 15 |
| 11 to 20 tons | | | | 1 | 1 | 2 |
| Total vessels | | | | 9 | 45 | 17 |
| Total net tonnage | | | | 63 | 296 | 142 |
| Boats: | | | | | | |
| Motor | 4 | 2 | 2 | 261 | 232 | 68 |
| Other | 4 | 19 | | 166 | 168 | 61 |
| Apparatus: | | | | | | |
| Haul seines | | 1 | 1 | 37 | 10 | 22 |
| Length, yards | | 100 | 75 | 13,225 | 1,680 | 2,660 |
| Gill nets, runaround | 1 | | | | | |
| Square yards | 30 | | | | | |
| Trammel nets | | 1 | | 10 | 4 | 7 |
| Square yards | | 96 | | 2,822 | 1,160 | 1,480 |
| Lines— | | | | | | |
| Hand | | | | 17 | | 14 |
| Hooks | | | | 17 | | 19 |
| Trot, with baits or snoods | 2 | 6 | | 40 | 7 | |
| Baits or snoods | 280 | 520 | | 8,500 | 1,450 | |
| Trot, with hooks | 3 | | | | | |
| Hooks | 300 | | | | | |
| Dip nets, drop | | | | | | 1,220 |
| Cast nets | 3 | | | | | |
| Otter trawls, shrimp | 1 | | 2 | 222 | 272 | 39 |
| Yards at mouth | 11 | | 27 | 2,830 | 3,564 | 543 |
| Dredges, oyster | | | | 2 | 1 | 23 |
| Yards at mouth | | | | 2 | 1 | 23 |
| Tongs | 5 | 14 | | 70 | 150 | |

*Fisheries of Louisiana, 1930*—Continued

OPERATING UNITS: BY PARISHES—Continued

| Item | Plaquemines | St. Bernard | St. Charles | St. Mary | St. Tammany | Terrebonne | Vermilion |
|---|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 74 | | | 34 | 8 | 82 | |
| On boats and shore— | | | | | | | |
| Regular | 362 | 199 | 24 | 135 | 10 | 522 | 49 |
| Casual | 8 | 64 | | 19 | 3 | 47 | 26 |
| Total | 444 | 263 | 24 | 188 | 21 | 651 | 75 |
| Vessel, motor: | | | | | | | |
| 5 to 10 tons | 22 | | | 9 | 1 | 34 | |
| 11 to 20 tons | 4 | | | 3 | 1 | 3 | |
| Total vessels | 26 | | | 12 | 2 | 37 | |
| Total net tonnage | 189 | | | 114 | 22 | 248 | |
| Boats: | | | | | | | |
| Motor | 137 | 49 | 12 | 37 | 2 | 172 | 19 |
| Other | 93 | 188 | | 81 | 8 | 260 | 25 |
| Apparatus: | | | | | | | |
| Haul seines | 17 | 22 | | 4 | | 11 | 13 |
| Length, yards | 2,950 | 3,455 | | 540 | | 1,180 | 2,010 |
| Trammel nets | 8 | 14 | | | | 5 | 1 |
| Square yards | 2,525 | 4,791 | | | | 705 | 133 |
| Lines— | | | | | | | |
| Hand | | 54 | | | | 62 | |
| Hooks | | 54 | | | | 62 | |
| Trot, with baits or snoods | 7 | 135 | | 83 | | 2 | 6 |
| Baits or snoods | 1,350 | 29,920 | | 15,800 | | 250 | 300 |
| Dip nets, drop | | | | | 480 | | |
| Otter trawls, shrimp | 134 | 24 | 12 | 44 | | 188 | 2 |
| Yards at mouth | 1,704 | 308 | 157 | 583 | | 2,461 | 25 |
| Dredges, oyster | 22 | | | 10 | 4 | 6 | 4 |
| Yards at mouth | 22 | | | 10 | 4 | 6 | 4 |
| Tongs | 55 | | | 26 | 4 | 200 | 2 |

CATCH: BY PARISHES

| Species | Cameron | | Iberia | | Jefferson Davis | | Jefferson | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Catfish and bullheads | 1,600 | $128 | | | | | 2,000 | $60 |
| Croaker | | | 55 | $2 | 440 | $12 | 1,520 | 45 |
| Drum: | | | | | | | | |
| Black | | | 137 | 12 | 55 | 2 | 8,330 | 250 |
| Red or redfish | | | 550 | 50 | 660 | 48 | 37,000 | 2,960 |
| Flounders | | | 30 | 6 | 110 | 10 | 4,540 | 363 |
| Ring whiting or "kingfish" | | | 165 | 6 | 550 | 20 | 24,220 | 726 |
| Mullet | 1,053 | 32 | | | | | 3,060 | 92 |
| Sharks | | | | | | | 300,000 | 1,400 |
| Sheepshead, salt-water | | | 220 | 30 | | | 9,140 | 457 |
| Spanish mackerel | | | | | | | 600 | 36 |
| Spot | | | | | | | 1,500 | 44 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | | | 275 | 12 | | | 4,000 | 120 |
| Spotted | 151 | 14 | 220 | 40 | 715 | 78 | 57,803 | 5,780 |
| Crabs: | | | | | | | | |
| Hard | 2,880 | 48 | 24,500 | 350 | | | 975,000 | 16,250 |
| Soft | | | | | | | 33,720 | 12,645 |
| Shrimp | 3,400 | 340 | 1,500 | 150 | 6,500 | 650 | 9,715,852 | 291,476 |
| Oysters: | | | | | | | | |
| Market, private, spring | 19,600 | 1,470 | 49,512 | 8,254 | | | 310,800 | 38,850 |
| Market, private, fall | 24,400 | 1,830 | 86,004 | 14,334 | | | 413,496 | 51,687 |
| Terrapin, diamond-back | | | | | | | 38,750 | 12,980 |
| Turtles, loggerhead | | | | | | | 50,050 | 1,502 |
| Total | 53,084 | 3,862 | 163,168 | 23,246 | 9,030 | 820 | 11,991,381 | 437,723 |

*Fisheries of Louisiana, 1930*—Continued

CATCH: BY PARISHES—Continued

| Species | LaFourche | | Orleans | | Plaquemines | | St. Bernard | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Catfish and bullheads | | | 14,400 | $432 | 10,430 | $312 | 10,300 | $309 |
| Croaker | 220 | $6 | 15,500 | 1,045 | 5,208 | 385 | 26,944 | 2,152 |
| Drum: | | | | | | | | |
| Black | 13,200 | 360 | 9,860 | 394 | 24,400 | 976 | 84,020 | 3,360 |
| Red or redfish | 53,900 | 3,920 | 24,150 | 1,932 | 28,304 | 2,265 | 54,172 | 4,332 |
| Flounders | 4,400 | 320 | 780 | 78 | 2,544 | 254 | 3,804 | 382 |
| Groupers | | | 3,500 | 105 | | | | |
| Jewfish | | | 6,000 | 180 | | | | |
| King whiting or "kingfish" | | | 2,500 | 75 | 3,200 | 96 | 16,404 | 491 |
| Mullet | | | | | | | 1,200 | 48 |
| Pompano | | | 420 | 126 | | | 252 | 75 |
| Sheepshead, salt-water | 22,052 | 1,003 | 10,050 | 603 | 12,656 | 759 | 28,028 | 1,691 |
| Snapper, red | | | 76,400 | 6,112 | | | | |
| Spanish mackerel | | | | | | | 1,200 | 72 |
| Spot | | | 900 | 27 | 2,600 | 78 | 4,704 | 141 |
| Squeteagues or "sea trout": | | | | | | | | |
| Gray | 3,300 | 90 | 4,200 | 126 | 32,600 | 978 | 265,000 | 7,948 |
| Spotted | 20,511 | 1,908 | 7,882 | 1,019 | 36,704 | 4,405 | 186,392 | 23,984 |
| Tripletail | 2,255 | 205 | | | 2,496 | 150 | | |
| Crabs: | | | | | | | | |
| Hard | 391,200 | 6,520 | 46,800 | 936 | 150,000 | 2,500 | 853,680 | 14,228 |
| Soft | | | 8,520 | 4,260 | 4,960 | 1,860 | 94,132 | 37,653 |
| Shrimp | 11,082,026 | 332,060 | 1,414,332 | 42,430 | 5,505,043 | 165,150 | 1,132,000 | 33,960 |
| Oysters: | | | | | | | | |
| Market, public, spring | | | 266,664 | 11,111 | | | | |
| Market, public, fall | | | 165,888 | 8,294 | | | | |
| Market, private, spring | 214,200 | 22,200 | 4,980 | 622 | 256,080 | 41,360 | | |
| Market, private, fall | 297,280 | 28,260 | 361,440 | 45,180 | 489,848 | 71,749 | | |
| Total | 12,104,544 | 396,852 | 2,445,166 | 125,087 | 6,567,073 | 293,277 | 2,762,232 | 130,826 |

| Species | St. Charles | | St. Mary | | St. Tammany | | Terrebonne | | Vermilion | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Catfish and bullheads | | | | | | | 48,213 | $1,822 | 2,200 | $150 |
| Crevalle | | | | | | | | | 165 | 15 |
| Croaker | | | 1,210 | $44 | | | 6,016 | 224 | 2,750 | 290 |
| Drum: | | | | | | | | | | |
| Black | | | 1,320 | 96 | | | 24,344 | 933 | 770 | 68 |
| Red or redfish | | | | | | | 131,306 | 9,860 | 4,840 | 592 |
| Flounders | | | 50 | 8 | | | 6,479 | 612 | 330 | 50 |
| Garfish | | | | | | | | | 1,320 | 120 |
| King whiting or "kingfish" | | | | | | | 6,338 | 230 | 990 | 60 |
| Mullet | | | | | | | 3,549 | 129 | 110 | 10 |
| Pompano | | | | | | | 440 | 100 | | |
| Sheepshead, salt-water | | | 880 | 80 | | | 15,248 | 970 | 3,850 | 400 |
| Squeteagues or "sea trout": | | | | | | | | | | |
| Gray | | | 2,640 | 120 | | | 11,314 | 415 | | |
| Spotted | | | 1,320 | 240 | | | 70,563 | 7,708 | 4,840 | 688 |
| Tripletail | | | | | | | | | 550 | 100 |
| Crabs: | | | | | | | | | | |
| Hard | | | 1,570,730 | 19,469 | 94,200 | $1,884 | 5,005 | 72 | 72,000 | 1,200 |
| Soft | | | | | 4,400 | 1,650 | | | | |
| Shrimp | 16,000 | $12,480 | 1,711,910 | 49,560 | | | 7,591,924 | 227,758 | 84,000 | 3,612 |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | 4,800 | 640 | | | | |
| Market, public, fall | | | 98,800 | 7,156 | 96,504 | 5,956 | | | 45,476 | 3,534 |
| Market, private, spring | | | 85,704 | 13,214 | | | 855,156 | 75,462 | 1,800 | 225 |
| Market, private, fall | | | 111,072 | 17,337 | | | 582,576 | 80,751 | 4,220 | 570 |
| Total | 16,000 | 12,480 | 3,585,636 | 107,324 | 199,904 | 10,130 | 9,358,471 | 407,046 | 230,211 | 11,684 |

*Industries related to the fisheries of Louisiana, 1930*

TRANSPORTING

| Item | Iberia Parish | Jefferson Parish | La Fourche Parish | Orleans Parish | Plaquemines Parish | St. Mary Parish | St. Tammany Parish | Terrebonne Parish | Vermilion Parish | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Persons engaged: | *No.* | *No.* | *No.* | *No.* | *No.* | *No.* | *No.* | *No.* | *No.* | *No.* |
| On vessels | ------- | 14 | 44 | 13 | 4 | 16 | ------- | 42 | ------- | 133 |
| On boats | 14 | 34 | 34 | ------- | 2 | 14 | 4 | 138 | 6 | 246 |
| Total | 14 | 48 | 78 | 13 | 6 | 30 | 4 | 180 | 6 | 379 |
| Vessels, motor: | | | | | | | | | | |
| 5 to 10 tons | ------- | 6 | 17 | 2 | 2 | 4 | ------- | 21 | ------- | 52 |
| 11 to 20 tons | ------- | 1 | 4 | 4 | ------- | 4 | ------- | ------- | ------- | 13 |
| Total | ------- | 7 | 21 | 6 | 2 | 8 | ------- | 21 | ------- | 65 |
| Net tonnage | ------- | 58 | 169 | 73 | 13 | 76 | ------- | 136 | ------- | 525 |
| Boats | 7 | 17 | 17 | ------- | 1 | 7 | 2 | 74 | 3 | 128 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Calcasieu, Jefferson Davis, and Vermilion Parishes | Iberia Parish | Jefferson Parish | Lafayette and St. Martin Parishes | La-Fourche Parish | Orleans Parish |
|---|---|---|---|---|---|---|
| Establishments | 5 | 3 | 16 | 3 | 7 | 10 |
| Persons engaged: | | | | | | |
| Proprietors | 8 | 4 | 16 | 3 | 9 | 19 |
| Salaried employees | 1 | ---------- | 13 | ---------- | 5 | 32 |
| Wage earners— | | | | | | |
| Average for season | 100 | 4 | 669 | 8 | 731 | 148 |
| Average for year | 18 | 4 | 310 | 6 | 254 | 84 |
| Paid to salaried employees | $100 | ---------- | $32,617 | ---------- | $13,672 | $132,611 |
| Paid to wage earners | 6,257 | $2,251 | 93,699 | $3,498 | 82,676 | 49,030 |
| Total salaries and wages | 6,357 | 2,251 | 126,316 | 3,498 | 96,348 | 181,641 |

| Item | Plaquemines and St. Bernard Parishes | St. Charles Parish | St. Mary Parish | Terrebonne Parish | Total |
|---|---|---|---|---|---|
| Establishments | 9 | 3 | 10 | 36 | 102 |
| Persons engaged: | | | | | |
| Proprietors | 2 | 6 | 11 | 55 | 133 |
| Salaried employees | 9 | ---------- | 16 | 24 | 100 |
| Wage earners— | | | | | |
| Average for season | 849 | 6 | 315 | 991 | 3,821 |
| Average for year | 344 | 6 | 249 | 508 | 1,783 |
| Paid to salaried employees | $13,100 | ---------- | $41,250 | $59,320 | $292,670 |
| Paid to wage earners | 97,452 | $1,814 | 141,453 | 168,068 | 646,198 |
| Total salaries and wages | 110,552 | 1,814 | 182,703 | 227,388 | 938,868 |

*Industries related to the fisheries of Louisiana, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Squeteague, sun-dried | pounds | 27,717 | $8,316 |
| Crab meat, packaged (fresh-cooked) | do | 190,220 | 46,780 |
| Shrimp: | | | |
| Sun-dried | do | 1,588,487 | 339,577 |
| Canned— | | | |
| Wet in tins | standard cases | 238,467 | 1,346,205 |
| Wet in glass | do | 2,462 | 26,865 |
| Dry in tins | do | 167,939 | 1,080,890 |
| Meal | tons | 1,445 | 39,357 |
| Oysters: | | | |
| Fresh-shucked | gallons | 242,712 | 413,350 |
| Canned | standard cases | 43,819 | 214,819 |
| Shell products— | | | |
| Poultry feed | tons | 116,880 | 1,012,767 |
| Lime | do | 9,347 | 28,997 |
| Miscellaneous [1] | | (2) | 60,410 |
| Total | | | 4,618,333 |

[1] Includes shark skins, fins, meat, and oil; canned crabs; and fresh-packaged shrimp.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 242 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## TEXAS

*Fisheries of Texas, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | | Trammel nets | Lines | |
|---|---|---|---|---|---|---|---|
| | | Anchor | Stake | Run-around | | Hand | Troll |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | | | | | 6 | 110 | |
| On boats and shore— | | | | | | | |
| Regular | 76 | 4 | 277 | 108 | 140 | 193 | 4 |
| Casual | 78 | | | | | 156 | |
| Total | 154 | 4 | 277 | 108 | 146 | 459 | 4 |
| Vessels, motor: | | | | | | | |
| 5 to 10 tons | | | | | | 4 | |
| 11 to 20 tons | | | | | 1 | 7 | |
| 21 to 30 tons | | | | | | 2 | |
| 31 to 40 tons | | | | | | 1 | |
| 41 to 50 tons | | | | | | 2 | |
| Total | | | | | 1 | 16 | |
| Net tonnage | | | | | 11 | 298 | |
| Boats: | | | | | | | |
| Motor | 6 | 2 | 47 | 28 | 54 | 82 | 3 |
| Other | 6 | | 72 | 22 | 45 | 423 | |
| Apparatus: | | | | | | | |
| Number | 63 | 2 | 383 | 102 | 80 | 459 | 8 |
| Length, yards | 11,250 | | | | | | |
| Square yards | | 2,000 | 95,294 | 23,854 | 26,651 | | |
| Hooks, baits, or snoods | | | | | | 678 | 8 |

*Fisheries of Texas, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Lines—Contd. | | Otter trawls, shrimp | Spears | Dredges, oyster | Tongs | By hand | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| | Trot, with baits or snoods | Trot, with hooks | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | 84 | | 18 | | | 178 |
| On boats and shore— | | | | | | | | |
| Regular | 12 | 24 | 464 | 88 | 106 | 316 | 112 | 1,421 |
| Casual | 6 | | | 87 | | 14 | 68 | 367 |
| Total | 18 | 24 | 548 | 175 | 124 | 330 | 180 | 1,966 |
| Vessels, motor: | | | | | | | | |
| 5 to 10 tons | | | 26 | | 4 | | | 27 |
| 11 to 20 tons | | | 6 | | 1 | | | 12 |
| 21 to 30 tons | | | | | | | | 2 |
| 31 to 40 tons | | | | | | | | 1 |
| 41 to 50 tons | | | | | | | | 2 |
| Total | | | 32 | | 5 | | | 44 |
| Net tonnage | | | 275 | | 50 | | | 535 |
| Boats: | | | | | | | | |
| Motor | 2 | 5 | 232 | 3 | 33 | 61 | | 431 |
| Other | 14 | 17 | | | | 219 | 122 | 498 |
| Apparatus: | | | | | | | | |
| Number | 33 | 36 | 264 | 175 | 38 | 330 | | |
| Yards at mouth | | | 3,855 | | 37 | | | |
| Hooks, baits, or snoods | 4,300 | 5,500 | | | | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Anchor | | Stake | | Runaround | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Bluefish | | | | | | | 165 | $14 |
| Catfish and bullheads | 29,700 | $1,350 | 550 | $30 | 12,024 | $497 | 4,620 | 208 |
| Crevalle | | | | | | | 154 | 4 |
| Croaker | 12,980 | 434 | | | 1,540 | 42 | 7,680 | 272 |
| Drum: | | | | | | | | |
| Black | 46,200 | 1,698 | 660 | 30 | 762,225 | 23,286 | 158,215 | 5,753 |
| Red or redfish | 77,154 | 6,010 | 2,860 | 260 | 324,856 | 28,127 | 57,117 | 4,184 |
| Flounders | 8,855 | 805 | | | 550 | 50 | 2,860 | 260 |
| King whiting or "kingfish" | 7,920 | 288 | | | | | 4,180 | 152 |
| Mullet | 3,630 | 132 | | | 3,741 | 75 | 550 | 25 |
| Pompano | 6,270 | 1,425 | | | | | 1,375 | 313 |
| Sheepshead | 7,370 | 327 | 220 | 16 | 7,051 | 300 | 3,300 | 160 |
| Snook or sergeantfish | 15,840 | 1,142 | | | 19,081 | 1,388 | 3,300 | 186 |
| Spadefish | 550 | 20 | | | | | | |
| Spanish mackerel | 2,420 | 132 | | | | | 6,600 | 360 |
| Squeteague or "sea trout," spotted | 116,170 | 11,873 | 2,200 | 300 | 302,252 | 32,974 | 109,742 | 10,252 |
| Total | 335,059 | 25,636 | 6,490 | 636 | 1,433,320 | 86,739 | 359,858 | 22,143 |

*Fisheries of Texas, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Trammel nets | | Lines | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Hand | | Troll | | Trot, with baits or snoods | | Trot, with hooks | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Catfish and bullheads | 11,924 | $550 | 22,584 | $1,027 | | | | | 16,170 | $718 |
| Croaker | 9,713 | 347 | | | | | | | | |
| Drum: | | | | | | | | | | |
| Black | 63,496 | 2,127 | 21,172 | 762 | | | | | | |
| Red or redfish | 169,672 | 14,963 | 210,358 | 16,678 | | | | | 30,580 | 2,224 |
| Flounders | 1,035 | 97 | 1,100 | 100 | | | | | | |
| Groupers | | | 20,855 | 630 | | | | | | |
| Jewfish | | | 1,430 | 56 | | | | | | |
| Kingfish or "king mackerel" | | | | | 3,080 | $120 | | | | |
| King whiting or "kingfish" | 3,630 | 132 | | | | | | | | |
| Pompano | 5,365 | 1,225 | | | | | | | | |
| Sheepshead | 6,710 | 340 | 16,610 | 726 | | | | | 440 | 24 |
| Snapper, red | | | 929,578 | 75,385 | | | | | | |
| Snook or sergeantfish | 1,225 | 100 | | | | | | | | |
| Spanish mackerel | 1,799 | 142 | 63,470 | 3,542 | | | | | | |
| Squeteague or "sea trout," spotted | 236,149 | 26,272 | 276,840 | 29,649 | | | | | | |
| Crabs, hard | | | | | | | 29,046 | $1,063 | | |
| Total | 510,718 | 46,295 | 1,563,997 | 128,555 | 3,080 | 120 | 29,046 | 1,063 | 47,190 | 2,966 |

| Species | Otter trawls, shrimp | | Spears | | Dredges, oyster | | Tongs | | By hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Flounders | | | 56,987 | $5,771 | | | | | | |
| Sheepshead | | | 550 | 40 | | | | | | |
| Shrimp | 10,189,318 | $377,016 | | | | | | | | |
| Oysters: | | | | | | | | | | |
| Market, public, spring | | | | | 267,466 | $15,029 | 209,854 | $17,523 | 38,432 | $3,336 |
| Market, public, fall | | | | | 219,463 | 14,657 | 330,052 | 23,510 | 84,304 | 5,229 |
| Market, private, spring | | | | | | | 3,040 | 475 | | |
| Market, private, fall | | | | | | | 4,704 | 735 | | |
| Total | 10,189,318 | 377,016 | 57,447 | 5,811 | 486,929 | 29,686 | 547,650 | 42,243 | 122,736 | 8,565 |

OPERATING UNITS: BY COUNTIES

| Item | Aransas | Brazoria | Calhoun | Cameron | Galveston | Harris |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2 | | 26 | | 114 | |
| On boats and shore— | | | | | | |
| Regular | 118 | 8 | 212 | 206 | 289 | 6 |
| Casual | 16 | | 58 | 20 | 117 | |
| Total | 136 | 8 | 296 | 226 | 520 | 6 |
| Vessels, motor: | | | | | | |
| 5 to 10 tons | 1 | | 6 | | 7 | |
| 11 to 20 tons | | | 2 | | 8 | |
| 21 to 30 tons | | | | | 2 | |
| 31 to 40 tons | | | | | 1 | |
| 41 to 50 tons | | | | | 2 | |
| Total | 1 | | 8 | | 20 | |
| Net tonnage | 7 | | 70 | | 337 | |

*Fisheries of Texas, 1930*—Continued

OPERATING UNITS: By counties—Continued

| Item | Aransas | Brazoria | Calhoun | Cameron | Galveston | Harris |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Boats: | | | | | | |
| Motor | 31 | 1 | 79 | 28 | 116 | 2 |
| Other | 46 | 5 | 40 | 44 | 117 | 3 |
| Apparatus: | | | | | | |
| Haul seines | | | 2 | | 45 | |
| Length, yards | | | 120 | | 8,990 | |
| Gill nets— | | | | | | |
| Stake | 58 | | 10 | 186 | | |
| Square yards | 9,280 | | 1,000 | 62,124 | | |
| Runaround | 12 | | | | | |
| Square yards | 1,940 | | | | | |
| Trammel nets | 11 | 1 | 18 | 14 | 13 | |
| Square yards | 1,430 | 450 | 9,561 | 3,500 | 4,458 | |
| Lines— | | | | | | |
| Hand | 26 | | 62 | 22 | 188 | |
| Hooks | 26 | | 62 | 34 | 385 | |
| Trot, with baits or snoods | 9 | | | | 20 | |
| Baits or snoods | 900 | | | | 3,000 | |
| Trot, with hooks | 20 | | | | | |
| Hooks | 3,800 | | | | | |
| Otter trawls, shrimp | 13 | | 60 | 8 | 80 | |
| Yards at mouth | 173 | | 878 | 103 | 1,203 | |
| Spears | 22 | | 36 | 9 | 28 | |
| Dredges, oysters | 2 | | 14 | | 8 | |
| Yards at mouth | 2 | | 15 | | 7 | |
| Tongs | 31 | 8 | 88 | | 91 | 6 |

| Item | Jefferson | Matagorda | Neuces | Refugio | San Patricio |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | |
| On vessels | | 6 | 20 | | 10 |
| On boats and shore— | | | | | |
| Regular | | 127 | 354 | 2 | 99 |
| Casual | 4 | 15 | 89 | 6 | 42 |
| Total | 4 | 148 | 463 | 8 | 151 |
| Vessels, motor: | | | | | |
| 5 to 10 tons | | 1 | 7 | | 5 |
| 11 to 20 tons | | 1 | 1 | | |
| Total | | 2 | 8 | | 5 |
| Net tonnage | | 25 | 61 | | 35 |
| Boats: | | | | | |
| Motor | | 44 | 88 | | 42 |
| Other | 4 | 20 | 188 | 8 | 23 |
| Apparatus: | | | | | |
| Haul seines | | | 16 | | |
| Length, yards | | | 2,140 | | |
| Gill nets— | | | | | |
| Anchor | | 2 | | | |
| Square yards | | 2,000 | | | |
| Stake | | | 129 | | |
| Square yards | | | 22,890 | | |
| Runaround | | | 54 | | 36 |
| Square yards | | | 11,900 | | 10,014 |
| Trammel nets | | 10 | 9 | | 4 |
| Square yards | | 4,252 | 1,800 | | 1,200 |
| Lines— | | | | | |
| Hand | 4 | | 113 | 6 | 38 |
| Hooks | 4 | | 123 | 6 | 38 |
| Troll | | | 4 | | 4 |
| Hooks | | | 4 | | 4 |
| Trot, with baits or snoods | 4 | | | | |
| Baits or snoods | 400 | | | | |
| Trot, with hooks | | | 6 | 4 | 6 |
| Hooks | | | 800 | 250 | 650 |
| Otter trawls, shrimp | | 26 | 40 | | 37 |
| Yards at mouth | | 391 | 563 | | 544 |
| Spears | | 25 | 25 | | 30 |
| Dredges, oysters | | 14 | | | |
| Yards at mouth | | 13 | | | |
| Tongs | | 40 | 64 | 2 | |

*Fisheries of Texas, 1930*—Continued

CATCH: BY COUNTIES

| Species | Aransas | | Brazoria | | Calhoun | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Catfish and bullheads | 5,005 | $228 | 220 | $10 | 10,558 | $480 |
| Croaker | 2,970 | 108 | 220 | 8 | 1,980 | 72 |
| Drum: | | | | | | |
| Black | 26,500 | 1,000 | 132 | 5 | 9,760 | 355 |
| Red or redfish | 59,051 | 4,295 | 3,300 | 300 | 263,064 | 22,881 |
| Flounders | 3,960 | 360 | 55 | 5 | 6,957 | 633 |
| King whiting or "kingfish" | 2,530 | 92 | 110 | 4 | 1,650 | 60 |
| Pompano | 690 | 162 | | | 220 | 50 |
| Sheepshead | 1,320 | 72 | 220 | 12 | 1,870 | 68 |
| Snook or sergeantfish | 840 | 48 | | | 825 | 76 |
| Spanish mackerel | 1,650 | 90 | | | 990 | 54 |
| Squeteague or "sea trout," spotted | 73,150 | 7,980 | 3,080 | 336 | 254,859 | 27,954 |
| Crabs, hard | 13,486 | 674 | | | | |
| Shrimp | 633,804 | 24,200 | | | 1,216,139 | 48,646 |
| Oysters: | | | | | | |
| Market, public, spring | 18,608 | 1,223 | 3,200 | 300 | 81,700 | 5,317 |
| Market, public, fall | 41,809 | 2,770 | 3,792 | 356 | 193,542 | 13,476 |
| Total | 885,373 | 43,302 | 14,329 | 1,336 | 2,044,114 | 120,112 |

| Species | Cameron | | Galveston | | Harris | | Jefferson | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Catfish and bullheads | 6,524 | $237 | 12,620 | $575 | | | | |
| Croaker | 4,103 | 149 | 9,900 | 360 | | | | |
| Drum: | | | | | | | | |
| Black | 518,956 | 14,153 | 5,216 | 237 | | | 150 | $8 |
| Red or redfish | 225,580 | 20,507 | 56,144 | 5,104 | | | 880 | 80 |
| Flounders | 440 | 40 | 8,360 | 1,065 | | | | |
| Groupers | | | 18,250 | 543 | | | | |
| Jewfish | | | 660 | 18 | | | | |
| King whiting or "kingfish | | | 4,840 | 176 | | | | |
| Mullet | 3,741 | 75 | 3,630 | 132 | | | | |
| Pompano | 935 | 213 | 1,320 | 300 | | | | |
| Sheepshead | 6,831 | 248 | 9,020 | 517 | | | 110 | 6 |
| Snapper, red | 72,442 | 7,244 | 823,432 | 65,713 | | | | |
| Snook or sergeantfish | 19,081 | 1,388 | 440 | 22 | | | | |
| Spadefish | | | 550 | 20 | | | | |
| Spanish mackerel | 809 | 88 | 4,620 | 252 | | | | |
| Squeteague or "sea trout," spotted | 234,700 | 25,604 | 122,177 | 14,090 | | | 1,265 | 172 |
| Crabs, hard | | | 13,160 | 329 | | | 2,400 | 60 |
| Shrimp | 213,448 | 7,485 | 3,552,960 | 125,702 | | | | |
| Oysters: | | | | | | | | |
| Market, public, spring | 2,400 | 400 | 211,288 | 11,651 | 3,040 | $285 | | |
| Market, public, fall | 3,360 | 420 | 75,340 | 7,073 | 3,520 | 330 | | |
| Market, private, spring | | | 3,040 | 475 | | | | |
| Market, private, fall | | | 4,704 | 735 | | | | |
| Total | 1,313,350 | 78,251 | 4,941,671 | 235,089 | 6,560 | 615 | 4,805 | 326 |

| Species | Matagorda | | Neuces | | Refugio | | San Patricio | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bluefish | | | 165 | $14 | | | | |
| Catfish and bullheads | 4,180 | $212 | 53,900 | 2,450 | 2,365 | $108 | 2,200 | $80 |
| Crevalle | | | 154 | 4 | | | | |
| Croaker | 1,650 | 60 | 7,240 | 198 | | | 3,850 | 140 |
| Drum: | | | | | | | | |
| Black | 5,390 | 230 | 466,064 | 16,948 | | | 19,800 | 720 |
| Red or redfish | 13,585 | 1,235 | 199,293 | 14,194 | 8,800 | 640 | 42,900 | 3,210 |
| Flounders | 7,965 | 1,020 | 38,060 | 3,460 | | | 5,500 | 500 |
| Groupers | | | 2,605 | 87 | | | | |
| Jewfish | | | 220 | 8 | | | 550 | 30 |
| Kingfish or "king mackerel" | | | 880 | 40 | | | 2,200 | 80 |
| King whiting or "kingfish" | 2,750 | 100 | 2,200 | 80 | | | 1,650 | 60 |
| Mullet | | | | | | | 550 | 25 |
| Pompano | 220 | 50 | 8,580 | 1,950 | | | 1,045 | 238 |
| Sheepshead | 1,540 | 104 | 18,260 | 756 | 440 | 24 | 2,640 | 126 |
| Snapper, red | | | 33,704 | 2,428 | | | | |
| Snook or sergeantfish | | | 15,400 | 1,120 | | | 2,860 | 162 |
| Spanish mackerel | 220 | 12 | 63,800 | 3,480 | | | 2,200 | 200 |
| Squeteague or "sea trout," spotted | 22,858 | 2,914 | 218,239 | 20,848 | 7,370 | 804 | 105,655 | 10,618 |
| Shrimp | 756,879 | 26,737 | 1,917,544 | 73,628 | | | 1,898,544 | 70,618 |
| Oysters: | | | | | | | | |
| Market, public, spring | 129,212 | 11,210 | 65,664 | 5,472 | 640 | 40 | | |
| Market, public, fall | 157,560 | 9,790 | 153,888 | 9,118 | 1,008 | 63 | | |
| Total | 1,104,009 | 53,674 | 3,265,860 | 156,283 | 20,623 | 1,679 | 2,092,144 | 86,807 |

*Industries related to the fisheries of Texas, 1930*

TRANSPORTING IN MATAGORDA COUNTY

| | |
|---|---|
| Persons engaged on vessels | 3 |
| Vessels | 1 |
| Net tonnage | 6 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Aransas County | Calhoun County | Cameron County | Galveston and Brazoria Counties | Matagorda County | Nueces County | San Patricio County | Total |
|---|---|---|---|---|---|---|---|---|
| Establishments | 4 | 11 | 6 | 13 | 7 | 10 | 4 | 55 |
| Persons engaged: | | | | | | | | |
| Proprietors | 4 | 12 | 5 | 19 | 9 | 12 | 5 | 66 |
| Salaried employees | 4 | 6 | 6 | 6 | 3 | 8 | 2 | 35 |
| Wage earners— | | | | | | | | |
| Average for season | 31 | 238 | 163 | 297 | 208 | 197 | 236 | 1,370 |
| Average for year | 16 | 90 | 87 | 179 | 91 | 95 | 169 | 727 |
| Paid to salaried employees | $4,620 | $7,080 | $7,870 | $25,536 | $3,320 | $8,270 | $4,890 | $61,586 |
| Paid to wage earners | 9,725 | 24,707 | 16,548 | 55,850 | 33,984 | 33,533 | 28,243 | 202,590 |
| Total salaries and wages | 14,345 | 31,787 | 24,418 | 81,386 | 37,304 | 41,803 | 33,133 | 264,176 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Shrimp: | | | |
| Packaged, headless— | | | |
| Fresh | pounds | 112,000 | $17,000 |
| Frozen | do | 1,485,387 | 266,878 |
| Canned— | | | |
| Wet in tins | standard cases | 45,788 | 276,828 |
| Wet in glass | do | 12,092 | 131,370 |
| Dry in tins | do | 9,151 | 55,426 |
| Oysters, fresh-shucked | gallons | 75,416 | 106,801 |
| Miscellaneous [1] | | (2) | 31,952 |
| Total | | | 886,255 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 210]

| | | | |
|---|---|---|---|
| Crab meat, packaged (fresh-cooked) | pounds | 577 | $144 |
| Shrimp, fresh headless, packaged | do | 54,855 | 3,840 |
| Oysters, fresh-shucked | gallons | 34,169 | 38,391 |
| Total | | | 42,375 |

[1] Includes fresh-cooked crab meat; sun-dried shrimp; shrimp bran; cooked shrimp; canned oysters; and oyster-shell products.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 196 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

## FISHERIES OF THE PACIFIC COAST STATES [10]

The yield of fishery products in the Pacific Coast States (Washington, Oregon, and California) during 1930 amounted to 833,388,643 pounds, valued at $23,064,140. This is a decrease of 19 per cent in the volume of the catch and 8 per cent in the value of the catch as compared with the quantity and its value for 1929. Of the total catch in 1930, 806,753,999 pounds, valued at $21,302,721, were fish; 22,790,435 pounds, valued at $1,594,466, were shellfish and miscellaneous products; and 3,844,209 pounds, valued at $166,953, were whale products. These fisheries gave employment to 19,574 fishermen or 2 per cent less than in 1929. Of the total number of fishermen employed during 1930, 6,165 were employed on vessels and 13,409 in the boat and shore fisheries.

*Fisheries of the Pacific Coast States, 1930*

SUMMARY OF CATCH

| Product | Washington | | Oregon | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Fish | 106,171,839 | $7,678,561 | 25,484,812 | $2,180,428 |
| Shellfish, etc. | 3,866,922 | 656,212 | 973,949 | 75,860 |
| Total | 110,038,761 | 8,334,773 | 26,458,761 | 2,256,288 |

| Product | California | | Total | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Fish | 675,097,348 | $11,443,732 | 806,753,999 | $21,302,721 |
| Shellfish, etc. | 17,949,564 | 862,394 | 22,790,435 | 1,594,466 |
| Whale products | 3,844,209 | 166,953 | 3,844,209 | 166,953 |
| Total | 696,891,121 | 12,473,079 | 833,388,643 | 23,064,140 |

OPERATING UNITS: BY STATES

| Item | Washington | | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| | Puget Sound district | Coastal district | Columbia River district | Total | Columbia River district | Coastal district | Total |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 2,265 | 14 | 12 | 2,291 | 66 | 16 | 82 |
| On boats and shore | 1,952 | 2,786 | 1,747 | 6,485 | 2,456 | 1,345 | 3,801 |
| Total | 4,217 | 2,800 | 1,759 | 8,776 | 2,522 | 1,361 | 3,883 |
| Vessels: | | | | | | | |
| Steam | 2 | | | 2 | | | |
| Net tonnage | 29 | | | 29 | | | |
| Motor | 338 | 7 | 6 | 351 | 28 | 7 | 35 |
| Net tonnage | 6,817 | 56 | 53 | 6,926 | 282 | 63 | 345 |
| Sail | 4 | | | 4 | | | |
| Net tonnage | 1,418 | | | 1,418 | | | |
| Total vessels | 344 | 7 | 6 | 357 | 28 | 7 | 35 |
| Total net tonnage | 8,264 | 56 | 53 | 8,373 | 282 | 63 | 345 |

[10] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure" which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith. Data on the operating units and catch of the fisheries of the Pacific Coast States have been taken largely from statistics collected by the various State agencies. Supplementary surveys, compilations, and analyses have been made by agents of this bureau in order that the figures may be presented in a manner comparable with those of other sections.

*Fisheries of the Pacific Coast States, 1930*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | Washington | | | | Oregon | | |
|---|---|---|---|---|---|---|---|
| | Puget Sound district | Coastal district | Columbia River district | Total | Columbia River district | Coastal district | Total |
| Boats: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Motor | 1,068 | 301 | 890 | 2,259 | 1,315 | 863 | 2,178 |
| Other | 496 | 234 | 231 | 961 | 86 | 187 | 273 |
| Apparatus: | | | | | | | |
| Purse seines— | | | | | | | |
| Salmon | 197 | | | 197 | | | |
| Length, yards | 122,140 | | | 122,140 | | | |
| Haul seines | 92 | | 57 | 149 | 41 | 2 | 43 |
| Length, yards | 8,644 | | 16,044 | 24,688 | 23,273 | 866 | 24,139 |
| Gill nets— | | | | | | | |
| Drift— | | | | | | | |
| Salmon | 377 | 106 | 543 | 1,026 | 921 | 479 | 1,400 |
| Square yards | 644,670 | 199,192 | 1,292,883 | 2,136,745 | 2,910,360 | 602,920 | 3,513,280 |
| Set— | | | | | | | |
| Salmon | 19 | 271 | 271 | 561 | 183 | 941 | 1,124 |
| Square yards | 6,726 | 91,320 | 66,124 | 164,170 | 47,580 | 151,181 | 198,761 |
| Lines— | | | | | | | |
| Trawl, set, and hand | 21,906 | 13 | 55 | 21,974 | 392 | 95 | 487 |
| Hooks | 476,490 | 1,300 | 5,500 | 483,290 | 39,200 | 9,500 | 48,700 |
| Troll | 2,156 | 64 | 724 | 2,944 | 1,201 | 517 | 1,718 |
| Hooks | 9,720 | 224 | 3,258 | 13,202 | 5,400 | 2,326 | 7,726 |
| Pound nets | 123 | 100 | 381 | 604 | 61 | | 61 |
| Brush weirs | 5 | | | 5 | | | |
| Fish wheels | | | 39 | 39 | | | |
| Dip nets | 9 | 30 | 122 | 161 | 184 | | 184 |
| Drag bag nets | 51 | 2 | | 53 | | | |
| Length, yards | 4,261 | 120 | | 4,381 | | | |
| Reef nets | 2 | | | 2 | | | |
| Beam trawls | 33 | | | 33 | | | |
| Yards at mouth | 226 | | | 226 | | | |
| Traps— | | | | | | | |
| Crab | 2,369 | 4,095 | | 6,464 | | 6,690 | 6,690 |
| Crawfish | | | | | 986 | | 986 |
| Tongs and rakes | 183 | 27 | | 210 | | 2 | 2 |
| Shovels | 228 | 2,664 | | 2,892 | | 246 | 246 |
| Spears | | 14 | | 14 | | | |

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | Southern district | | Total | |
| | | | | San Pedro division | San Diego division | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 24 | 345 | 557 | 2,025 | 841 | 3,792 | 6,165 |
| On boats and shore | 552 | 997 | 632 | 732 | 210 | 3,123 | 13,409 |
| Total | 576 | 1,342 | 1,189 | 2,757 | 1,051 | 6,915 | 19,574 |
| Vessels: | | | | | | | |
| Steam | | 4 | | | | 4 | 6 |
| Net tonnage | | 153 | | | | 153 | 182 |
| Motor | 10 | 30 | 52 | 254 | 117 | 463 | 849 |
| Net tonnage | 73 | 408 | 904 | 7,707 | 5,246 | 14,338 | 21,609 |
| Sail | | 4 | | | | 4 | 8 |
| Net tonnage | | 1,722 | | | | 1,722 | 3,140 |
| Total vessels | 10 | 38 | 52 | 254 | 117 | 471 | 863 |
| Total net tonnage | 73 | 2,283 | 904 | 7,707 | 5,246 | 16,213 | 24,931 |
| Boats: | | | | | | | |
| Motor | 206 | 538 | 237 | 405 | 119 | 1,505 | 5,942 |
| Other | 212 | 89 | 35 | 41 | 3 | 380 | 1,614 |

*Fisheries of the Pacific Coast States, 1930*—Continued

OPERATING UNITS: BY STATES—Continued

| Item | California | | | | | | Grand total |
|---|---|---|---|---|---|---|---|
| | Northern district | San Francisco district | Monterey district | Southern district | | Total | |
| | | | | San Pedro division | San Diego division | | |
| Apparatus: | | | | | | | |
| Purse seines— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Barracuda | | | | 33 | | 33 | 33 |
| Length, yards | | | | 14,228 | | 14,228 | 14,228 |
| Salmon | | | | | | | 197 |
| Length, yards | | | | | | | 122,140 |
| Sardine | | | 5 | 78 | | 83 | 83 |
| Length, yards | | | 2,050 | 31,747 | | 33,797 | 33,797 |
| Tuna | | | | 82 | | 82 | 82 |
| Length, yards | | | | 46,625 | | 46,625 | 46,625 |
| Lampara nets— | | | | | | | |
| Sardine | | 19 | 62 | 39 | 17 | 137 | 137 |
| Length, yards | | 4,080 | 20,756 | 17,106 | 4,790 | 46,732 | 46,732 |
| Squid | | | 52 | | | 52 | 52 |
| Length, yards | | | 10,220 | | | 10,220 | 10,220 |
| Other | | | | 52 | | 52 | 52 |
| Length, yards | | | | 21,152 | | 21,152 | 21,152 |
| Haul seines | 18 | 1 | | 1 | | 20 | 212 |
| Length, yards | 2,685 | 100 | | 100 | | 2,885 | 51,712 |
| Gill nets— | | | | | | | |
| Drift— | | | | | | | |
| Barracuda | | | | 38 | 19 | 57 | 57 |
| Square yards | | | | 330,904 | 94,804 | 425,708 | 425,708 |
| Salmon | 166 | 197 | | | | 363 | 2,789 |
| Square yards | 158,253 | 634,088 | | | | 792,341 | 6,442,366 |
| Sea bass | | 17 | 23 | | | 40 | 40 |
| Square yards | | 38,070 | 45,322 | | | 83,392 | 83,392 |
| Shad | | 133 | | | | 133 | 133 |
| Square yards | | 441,226 | | | | 441,226 | 441,226 |
| Striped bass | | 160 | | | | 160 | 160 |
| Square yards | | 434,720 | | | | 434,720 | 434,720 |
| Set— | | | | | | | |
| Salmon | | | | | | | 1,685 |
| Square yards | | | | | | | 362,931 |
| Sea bass | | | | 37 | 22 | 59 | 59 |
| Square yards | | | | 152,625 | 120,450 | 273,075 | 273,075 |
| Miscellaneous— | | | | | | | |
| Other | 12 | 64 | 61 | 37 | 11 | 185 | 185 |
| Square yards | 8,862 | 108,177 | 83,390 | 30,905 | 6,826 | 238,160 | 238,160 |
| Trammel nets | | | 8 | 35 | 18 | 61 | 61 |
| Square yards | | | 12,480 | 255,500 | 247,572 | 515,552 | 515,552 |
| Lines— | | | | | | | |
| Trawl, set, and hand | 369 | 619 | 1,954 | 1,450 | 735 | 5,127 | 27,588 |
| Hooks | 57,907 | 55,843 | 140,631 | 255,987 | 115,690 | 626,058 | 1,158,048 |
| Troll | 857 | 936 | 1,214 | 2,215 | 1,545 | 6,767 | 11,429 |
| Hooks | 4,040 | 4,780 | 4,977 | 2,215 | 1,545 | 17,557 | 38,485 |
| Pound nets | | | | | | | 665 |
| Brush weirs | | | | | | | 5 |
| Fish wheels | | | | | | | 39 |
| Fyke nets | | 2,102 | | | | 2,102 | 2,102 |
| Dip nets | 42 | | | | | 42 | 387 |
| Bag nets, shrimp | | 16 | | | | 16 | 16 |
| Length, yards | | 8,996 | | | | 8,996 | 8,996 |
| Drag bag nets | | | | | | | 53 |
| Length, yards | | | | | | | 4,381 |
| Reef nets | | | | | | | 2 |
| Paranzella nets | 1 | 10 | 1 | 4 | | 16 | 16 |
| Yards at mouth | 17 | 170 | 17 | 67 | | 271 | 271 |
| Beam trawls | | 22 | | | | 22 | 55 |
| Yards at mouth | | 147 | | | | 147 | 373 |
| Traps— | | | | | | | |
| Crab | 408 | 4,086 | | | | 4,494 | 17,648 |
| Crawfish | | | | | | | 986 |
| Lobster | | | | 2,805 | 1,572 | 4,377 | 4,377 |
| Octopus | 10 | | 141 | | | 151 | 151 |
| Harpoons— | | | | | | | |
| Swordfish and turtle | | | | 22 | 24 | 46 | 46 |
| Whale | | 4 | | | | 4 | 4 |
| Tongs and rakes | | 22 | 1 | | | 23 | 235 |
| Shovels | 9 | 28 | 8 | 61 | | 106 | 3,244 |
| Abalone outfits | | | 12 | 1 | | 13 | 13 |
| Spears | | | | | | | 14 |

*Fisheries of the Pacific Coast States, 1930*—Continued

CATCH: BY STATES

| Species | Washington | | Oregon | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| FISH | | | | |
| Carp | 214,729 | $6,441 | | |
| Cod [2] | 9,977,023 | 151,190 | | |
| Dolly Varden trout | 2,348 | 185 | | |
| Flounders: | | | | |
| "Sole" | 271,575 | 10,320 | 7,723 | $257 |
| Other | 92,161 | 2,673 | 37,722 | 1,220 |
| Grayfish | 371,180 | 1,309 | | |
| Hake | | | 265 | 3 |
| Halibut | 12,688,277 | 1,534,627 | 412,644 | 47,483 |
| Herring | 489,092 | 2,877 | 138,756 | 2,408 |
| "Lingcod" | 1,022,303 | 38,562 | 187,510 | 4,595 |
| Perch | 59,853 | 2,439 | 42,405 | 945 |
| Rockfishes | 637,082 | 23,926 | 118,688 | 3,422 |
| Sablefish | 2,780,448 | 127,790 | 190,269 | 6,209 |
| Salmon | 72,746,074 | 5,526,245 | 20,865,628 | 1,925,337 |
| Shad | 531,815 | 10,636 | 1,311,845 | 26,240 |
| Skates | 1,170 | 28 | | |
| Smelt | 2,140,055 | 58,248 | 194,172 | 4,219 |
| Steelhead trout | 2,073,990 | 178,243 | 1,879,573 | 152,519 |
| Striped bass | | | 15,664 | 1,942 |
| Sturgeon | 63,194 | 2,627 | 78,782 | 3,389 |
| Tuna and tunalike fishes, albacore | | | 3,166 | 240 |
| Other fish | 9,470 | 195 | | |
| Total | 106,171,839 | 7,678,561 | 25,484,812 | 2,180,428 |
| SHELLFISH, ETC. | | | | |
| Crabs | 1,822,438 | 115,288 | 725,532 | 44,106 |
| Crawfish | | | 176,800 | 17,680 |
| Shrimp | 88,149 | 6,699 | | |
| Clams: | | | | |
| Hard | 514,748 | 38,599 | | |
| Razor | 799,516 | 152,130 | 38,372 | 7,197 |
| Soft | | | 25,068 | 1,567 |
| Octopus | 86,413 | 4,148 | | |
| Oysters: | | | | |
| Eastern, market | 1,970 | 1,851 | | |
| Japanese, market | 228,318 | 82,875 | | |
| Native, market | 302,659 | 250,502 | 8,177 | 5,310 |
| Scallops | 11,583 | 3,564 | | |
| Squid | 11,128 | 556 | | |
| Total | 3,866,922 | 656,212 | 973,949 | 75,860 |
| Grand total | 110,038,761 | 8,334,773 | 26,458,761 | 2,256,288 |

| Species | California [1] | | Total | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| FISH | | | | |
| Anchovies | 319,561 | $4,214 | 319,561 | $4,214 |
| Barracuda | 4,763,766 | 379,122 | 4,763,766 | 379,122 |
| Cabrilla | 509,539 | 27,090 | 509,539 | 27,090 |
| Carp | 69,387 | 1,490 | 284,116 | 7,931 |
| Catfish | 433,191 | 58,228 | 433,191 | 58,228 |
| Cod [2] | 9,259,119 | 150,928 | 19,236,142 | 302,118 |
| Dolly Varden trout | | | 2,348 | 185 |
| Eels | 20 | 2 | 20 | 2 |
| Flounders: | | | | |
| "California halibut" | 1,066,641 | 128,930 | 1,066,641 | 128,930 |
| "Sole" | 10,919,053 | 659,840 | 11,198,351 | 670,417 |
| Other | 1,019,876 | 42,768 | 1,149,759 | 46,661 |
| Flyingfish | 48,458 | 1,805 | 48,458 | 1,805 |
| Grayfish | 647,297 | 11,671 | 1,018,477 | 12,980 |
| Hake | 56,088 | 561 | 56,353 | 564 |
| Halfmoon | 36,765 | 2,720 | 36,765 | 2,720 |
| Halibut | 445,077 | 49,474 | 13,545,998 | 1,631,584 |
| Hardhead | 38,857 | 5,257 | 38,857 | 5,257 |
| Herring | 748,948 | 7,707 | 1,376,796 | 12,992 |

[1] Taken off Pacific coast, including Latin America.
[2] The cod were taken off Alaska.

*Fisheries of the Pacific Coast States, 1930*—Continued

CATCH: BY STATES—Continued

| Species | California | | Total | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| FISH—continued | | | | |
| Horse mackerel | 368,828 | $11,142 | 368,828 | $11,142 |
| Kingfish | 457,158 | 11,143 | 457,158 | 11,143 |
| "Lingcod" | 1,293,643 | 54,909 | 2,503,456 | 98,066 |
| Mackerel | 16,531,364 | 241,569 | 16,531,364 | 241,569 |
| Mullet | 21,307 | 1,950 | 21,307 | 1,950 |
| Perch | 268,337 | 11,201 | 370,595 | 14,585 |
| Pilchard or sardines | 494,450,747 | 2,377,432 | 449,450,747 | 2,377,432 |
| Pompano | 2,223 | 1,113 | 2,223 | 1,113 |
| Rock bass | 508,163 | 32,417 | 508,163 | 32,417 |
| Rockfishes | 7,213,354 | 281,154 | 7,969,124 | 308,502 |
| Sablefish | 1,361,494 | 47,579 | 4,332,211 | 181,578 |
| Salmon | 6,002,894 | 528,765 | 99,614,596 | 7,980,347 |
| Sculpin | 89,656 | 9,017 | 89,656 | 9,017 |
| Sea bass: | | | | |
| Black | 394,009 | 19,878 | 394,009 | 19,878 |
| White or squeteague | 1,626,422 | 144,482 | 1,626,422 | 144,482 |
| Shad | 1,199,459 | 45,314 | 3,043,119 | 82,190 |
| Sheepshead | 243,689 | 9,035 | 243,689 | 9,035 |
| Skates | 286,390 | 5,753 | 287,560 | 5,781 |
| Smelt | 1,057,680 | 54,262 | 3,391,907 | 116,729 |
| Spanish mackerel | 42,965 | 2,041 | 42,965 | 2,041 |
| Splittail | 18,528 | 555 | 18,528 | 555 |
| Squawfish | 5,207 | 300 | 5,207 | 300 |
| Steelhead trout | | | 3,953,563 | 330,762 |
| Striped bass | 866,808 | 90,387 | 882,472 | 92,329 |
| Sturgeon | | | 141,976 | 6,016 |
| Suckers | 1,990 | 100 | 1,990 | 100 |
| Swordfish | 562,729 | 75,495 | 562,729 | 75,495 |
| Tomcod | 23,172 | 926 | 23,172 | 926 |
| Tuna and tunalike fishes: | | | | |
| Albacore | 283,117 | 23,651 | 286,283 | 23,891 |
| Bluefin | 21,921,282 | 1,238,017 | 21,921,282 | 1,238,017 |
| Bonito | 5,164,260 | 166,566 | 5,164,260 | 166,566 |
| Skipjack or striped tuna | 20,485,587 | 789,836 | 20,485,587 | 789,836 |
| Yellowfin | 56,654,181 | 3,396,217 | 56,654,181 | 3,396,217 |
| Whitebait | 179,438 | 11,927 | 179,438 | 11,927 |
| Whitefish | 225,102 | 12,960 | 225,102 | 12,960 |
| Yellowtail | 4,770,428 | 209,776 | 4,770,428 | 209,776 |
| Other fish | 134,094 | 5,056 | 143,564 | 5,251 |
| Total | 675,097,348 | 11,443,732 | 806,753,999 | 21,302,721 |
| SHELLFISH, ETC. | | | | |
| Crabs | 1,992,396 | 239,886 | 4,540,366 | 399,280 |
| Crawfish | | | 176,800 | 17,680 |
| Sea crawfish or spiny lobster | 1,394,139 | 263,145 | 1,394,139 | 263,145 |
| Shrimp | 2,696,567 | 42,272 | 2,784,716 | 48,971 |
| Abalone | 647,316 | 130,331 | 647,316 | 130,331 |
| Clams: | | | | |
| Cockle | 30,051 | 9,659 | 30,051 | 9,659 |
| Hard | | | 514,748 | 38,599 |
| Pismo | 21,772 | 9,610 | 21,772 | 9,610 |
| Razor | | | 837,888 | 159,327 |
| Soft | 37,303 | 9,474 | 62,371 | 11,041 |
| Mixed | 5,162 | 1,098 | 5,162 | 1,098 |
| Mussels | 33 | 6 | 33 | 6 |
| Octopus | 76,980 | 7,265 | 163,393 | 11,413 |
| Oysters: | | | | |
| Eastern, market | 72,796 | 29,118 | 74,766 | 30,969 |
| Japanese, market | | | 228,318 | 82,875 |
| Native, market | 4,949 | 3,093 | 315,785 | 258,905 |
| Scallops | | | 11,583 | 3,564 |
| Squid | 10,969,462 | 117,372 | 10,980,590 | 117,928 |
| Terrapin | 58 | 7 | 58 | 7 |
| Turtles | 580 | 58 | 580 | 58 |
| Total | 17,949,564 | 862,394 | 22,790,435 | 1,594,466 |
| WHALE PRODUCTS | | | | |
| Whale oil | 3,844,209 | 166,953 | 3,844,209 | 166,953 |
| Grand total | 696,891,121 | 12,473,079 | 833,388,643 | 23,064,140 |

*Industries related to the fisheries of the Pacific Coast States, 1930*

| Item | Washington | Oregon | California | Total |
|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | 160 | 48 | 41 | 249 |
| Vessels— | | | | |
| Steam | | | 1 | 1 |
| Net tonnage | | | 33 | 33 |
| Motor | 64 | 27 | 7 | 98 |
| Net tonnage | 1,425 | 286 | 539 | 2,250 |
| Total vessels | 64 | 27 | 8 | 99 |
| Total net tonnage | 1,425 | 286 | 572 | 2,283 |
| Wholesale and manufacturing: | | | | |
| Establishments | 104 | 54 | 151 | 309 |
| Persons engaged— | | | | |
| Proprietors | 125 | 47 | 213 | 385 |
| Salaried employees | 194 | 73 | 630 | 897 |
| Wage earners— | | | | |
| Average for season | 2,134 | 734 | 7,686 | 10,554 |
| Average for year | 982 | 459 | 3,639 | 5,080 |
| Salaries and wages paid | $1,797,902 | $792,978 | $6,046,115 | $8,636,995 |
| Manufactured products [1] | $11,150,491 | $5,087,826 | $29,720,076 | $45,958,393 |

[1] These production figures are not comparable with those shown in previous bulletins since packaged fresh and frozen products are now included.

## WASHINGTON

*Fisheries of Washington, 1930*

CATCH: BY DISTRICTS

| Species | Puget Sound district | | Coastal district | | Columbia River district | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Carp | | | 6,483 | $194 | 208,246 | $6,247 |
| Cod | 9,977,023 | $151,190 | | | | |
| Dolly Varden trout | 2,348 | 185 | | | | |
| Flounders: | | | | | | |
| "Sole" | 271,575 | 10,320 | | | | |
| Other | 92,161 | 2,673 | | | | |
| Grayfish | 371,180 | 1,309 | | | | |
| Halibut | 12,684,759 | 1,534,287 | 3,518 | 340 | | |
| Herring | 489,092 | 2,877 | | | | |
| "Lingcod" | 961,206 | 37,951 | 61,097 | 611 | | |
| Perch | 58,421 | 2,396 | 1,432 | 43 | | |
| Rockfishes | 617,112 | 23,748 | 19,970 | 178 | | |
| Sablefish | 2,780,448 | 127,790 | | | | |
| Salmon: | | | | | | |
| Blueback, red or sockeye | 23,134,160 | 2,100,949 | 1,393,838 | 204,894 | 295,032 | 50,155 |
| Chinook or king | 11,499,406 | 1,190,070 | 1,396,129 | 126,297 | 7,080,215 | 861,104 |
| Chum or keta | 10,120,120 | 104,340 | 1,382,844 | 6,914 | 579,842 | 2,898 |
| Humpback or pink | 271,705 | 8,030 | | | | |
| Silver or coho | 10,699,117 | 626,574 | 2,047,855 | 90,312 | 2,845,811 | 153,708 |
| Shad | | | | | 531,815 | 10,636 |
| Skates | 1,170 | 28 | | | | |
| Smelt | 416,999 | 28,355 | 115,640 | 5,782 | 1,607,416 | 24,111 |
| Steelhead trout | 95,004 | 13,269 | 108,910 | 7,187 | 1,870,076 | 157,787 |
| Sturgeon | 1,064 | 53 | 7,470 | 224 | 54,660 | 2,350 |
| Other fish | 9,470 | 195 | | | | |
| Total | 84,553,540 | 5,966,589 | 6,545,186 | 442,976 | 15,073,113 | 1,268,996 |
| SHELLFISH | | | | | | |
| Crabs | 443,278 | 23,574 | 1,379,160 | 91,714 | | |
| Shrimp | 88,149 | 6,699 | | | | |
| Clams: | | | | | | |
| Hard | 507,983 | 37,759 | 6,765 | 840 | | |
| Razor | | | 799,516 | 152,130 | | |
| Octopus | 86,413 | 4,148 | | | | |
| Oysters: | | | | | | |
| Eastern, market | | | 1,970 | 1,851 | | |
| Japanese, market | 69,646 | 33,463 | 158,672 | 49,412 | | |
| Native, market | 294,466 | 244,404 | 8,193 | 6,098 | | |
| Scallops | 11,583 | 3,564 | | | | |
| Squid | 11,128 | 556 | | | | |
| Total | 1,512,646 | 354,167 | 2,354,276 | 302,045 | | |
| Grand total | 86,066,186 | 6,320,756 | 8,899,462 | 745,021 | 15,073,113 | 1,268,996 |

*Fisheries of the Puget Sound district of Washington, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines, salmon | Haul seines | Gill nets | | Lines | | Pound nets | Brush weirs |
|---|---|---|---|---|---|---|---|---|
| | | | Drift, salmon | Set, salmon | Trawl, set, and hand | Troll | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 1,576 | 10 | 5 | | 699 | 116 | 24 | |
| On boats and shore | 50 | 272 | 422 | 13 | 58 | 586 | 195 | 10 |
| Total | 1,626 | 282 | 427 | 13 | 757 | 702 | 219 | 10 |
| Vessels: | | | | | | | | |
| Motor | 190 | 3 | 3 | | 104 | 58 | 8 | |
| Net tonnage | 4,390 | 17 | 19 | | 2,179 | 415 | 181 | |
| Sail | | | | | 4 | | | |
| Net tonnage | | | | | 1,418 | | | |
| Total vessels | 190 | 3 | 3 | | 108 | 58 | 8 | |
| Total net tonnage | 4,390 | 17 | 19 | | 3,597 | 415 | 181 | |
| Boats: | | | | | | | | |
| Motor | 7 | 57 | 366 | 3 | 97 | 438 | 22 | |
| Other | | 51 | 8 | 10 | 117 | | 118 | 4 |
| Apparatus: | | | | | | | | |
| Number | 197 | 92 | 377 | 19 | 21,906 | 2,156 | 123 | 5 |
| Length, yards | 122,140 | 8,644 | | | | | | |
| Square yards | | | 644,670 | 6,726 | | | | |
| Hooks | | | | | 476,490 | 9,720 | | |

| Item | Dip nets | Drag bag nets | Reef nets | Beam trawls | Traps, crab | Tongs and rakes | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 46 | | | | 2,265 |
| On boats and shore | 9 | 124 | 5 | 30 | 111 | 69 | 228 | 1,952 |
| Total | 9 | 124 | 5 | 76 | 111 | 69 | 228 | 4,217 |
| Vessels: | | | | | | | | |
| Steam | | | | 2 | | | | 2 |
| Net tonnage | | | | 29 | | | | 29 |
| Motor | | | | 17 | | | | 338 |
| Net tonnage | | | | 204 | | | | 6,817 |
| Sail | | | | | | | | 4 |
| Net tonnage | | | | | | | | 1,418 |
| Total vessels | | | | 19 | | | | 344 |
| Total net tonnage | | | | 233 | | | | 8,264 |
| Boats: | | | | | | | | |
| Motor | | 36 | 2 | 14 | 103 | 21 | | 1,068 |
| Other | | 18 | 2 | | | 174 | | 496 |
| Apparatus: | | | | | | | | |
| Number | 9 | 51 | 2 | 33 | 2,369 | 183 | 228 | |
| Length, yards | | 4,261 | | | | | | |
| Yards at mouth | | | | 226 | | | | |

*Fisheries of the Puget Sound district of Washington, 1930*—Continued

CATCH: BY GEAR

| Species | Purse seines | | Haul seines | | Gill nets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Drift | | Set | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Dolly Varden trout | | | 1,995 | $160 | | | | |
| Flounders: | | | | | | | | |
| "Sole" | | | 8,317 | 316 | | | 1,078 | $41 |
| Other | | | 11,007 | 319 | 54 | $2 | | |
| Grayfish | | | 99,500 | 348 | | | 5,100 | 18 |
| Herring | | | 6,075 | 35 | | | | |
| "Lingcod" | | | 1,900 | 49 | | | | |
| Perch | | | 44,156 | 1,810 | | | | |
| Rockfishes | 16 | $1 | 11,381 | 364 | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 17,502,681 | 1,497,140 | 80,122 | 9,535 | 23,156 | 2,756 | | |
| Chinook or king | 533,855 | 39,508 | 34,012 | 4,115 | 1,098,548 | 132,924 | | |
| Chum or keta | 9,037,570 | 90,464 | | | 295,080 | 4,426 | | |
| Humpback or pink | 232,100 | 6,959 | 835 | 25 | 2,715 | 73 | | |
| Silver or coho | 4,896,778 | 275,664 | 29,272 | 2,166 | 521,824 | 38,615 | 1,016 | 75 |
| Skates | | | 376 | 11 | | | 76 | 2 |
| Smelt | | | 253,960 | 17,269 | | | | |
| Steelhead trout | 702 | 70 | | | 25,047 | 3,507 | | |
| Sturgeon | 168 | 8 | | | | | | |
| Other fish | | | 754 | 16 | | | | |
| Total | 32,203,870 | 1,909,814 | 583,662 | 36,538 | 1,966,424 | 182,303 | 7,270 | 136 |
| SHELLFISH | | | | | | | | |
| Octopus | | | | | | | 1,686 | 81 |
| Squid | | | 11,128 | 556 | | | | |
| Grand total | 32,203,870 | 1,909,814 | 594,790 | 37,094 | 1,966,424 | 182,303 | 8,956 | 217 |

| Species | Lines | | | | Pound nets | | Brush weirs | |
|---|---|---|---|---|---|---|---|---|
| | Trawl, set, and hand | | Troll | | | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Cod | 9,977,023 | $151,190 | | | | | | |
| Dolly Varden trout | 353 | 25 | | | | | | |
| Flounders: | | | | | | | | |
| "Sole" | 58 | 2 | | | 865 | $33 | | |
| Other | | | | | 2,425 | 70 | | |
| Grayfish | 140,550 | 492 | | | | | | |
| Halibut | 12,664,547 | 1,532,297 | 19,688 | $1,928 | 524 | 62 | | |
| Herring | 21,647 | 126 | | | 20,300 | 118 | 437,800 | $2,579 |
| "Lingcod" | 863,958 | 35,314 | 13,001 | 433 | | | | |
| Perch | 1,100 | 45 | | | 185 | 8 | | |
| Rockfishes | 582,357 | 22,643 | 11,035 | 345 | | | | |
| Sablefish | 2,780,448 | 127,790 | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | | | 609 | 65 | 5,525,996 | 591,282 | | |
| Chinook or king | | | 5,237,543 | 553,979 | 4,595,184 | 459,518 | | |
| Chum or keta | | | | | 786,880 | 9,443 | | |
| Humpback or pink | | | 380 | 10 | 35,675 | 963 | | |
| Silver or coho | | | 2,965,035 | 161,517 | 2,282,480 | 148,361 | | |
| Skates | 18 | 1 | | | | | | |
| Steelhead trout | | | | | 69,255 | 9,692 | | |
| Sturgeon | | | | | 896 | 45 | | |
| Other fish | 423 | 8 | | | | | | |
| Total | 27,032,482 | 1,869,933 | 8,247,291 | 718,277 | 13,320,665 | 1,219,595 | 437,800 | 2,579 |
| SHELLFISH | | | | | | | | |
| Octopus | 84,319 | 4,047 | | | 408 | 20 | | |
| Grand total | 27,116,801 | 1,873,980 | 8,247,291 | 718,277 | 13,321,073 | 1,219,615 | 437,800 | 2,579 |

*Fisheries of the Puget Sound district of Washington, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Dip nets | | Drag bag nets | | Reef nets | | Beam trawls | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Flounders: | | | | | | | | |
| "Sole" | | | | | | | 261,257 | $9,928 |
| Other | | | | | | | 78,675 | 2,282 |
| Grayfish | | | 2,000 | $7 | | | 124,030 | 444 |
| Herring | 3,170 | $18 | 100 | 1 | | | | |
| "Lingcod" | | | | | | | 82,347 | 2,155 |
| Perch | | | 12,797 | 525 | | | 183 | 8 |
| Rockfishes | | | 53 | 2 | | | 12,270 | 393 |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | | | | | 1,596 | $171 | | |
| Chinook or king | | | | | 264 | 26 | | |
| Chum or keta | | | | | 590 | 7 | | |
| Silver or coho | | | | | 2,712 | 176 | | |
| Skates | | | | | | | 700 | 14 |
| Smelt | 481 | 32 | 162,558 | 11,054 | | | | |
| Other fish | 225 | 5 | 3,953 | 80 | | | 4,115 | 86 |
| Total | 3,876 | 55 | 181,461 | 11,669 | 5,162 | 380 | 563,577 | 15,310 |
| SHELLFISH | | | | | | | | |
| Shrimp | | | | | | | 88,149 | 6,699 |
| Scallops | | | | | | | 11,583 | 3,564 |
| Total | | | | | | | 99,732 | 10,263 |
| Grand total | 3,876 | 55 | 181,461 | 11,669 | 5,162 | 380 | 663,309 | 25,573 |

| Species | Traps | | Tongs and rakes | | Shovels | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH | | | | | | |
| Crabs | 443,278 | $23,574 | | | | |
| Clams, hard | | | | | 507,983 | $37,759 |
| Oysters: | | | | | | |
| Japanese, market | | | 69,646 | $33,463 | | |
| Native, market | | | 294,466 | 244,404 | | |
| Total | 443,278 | 23,574 | 364,112 | 277,867 | 507,983 | 37,759 |

*Fisheries of the coastal district of Washington, 1930*

OPERATING UNITS: BY GEAR

| Item | Gill nets | | Lines | | Pound nets | Dip nets |
|---|---|---|---|---|---|---|
| | Drift, salmon | Set, salmon | Set | Troll | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | | | | 12 | | |
| On boats and shore | 130 | 190 | 13 | 10 | 61 | 30 |
| Total | 130 | 190 | 13 | 22 | 61 | 30 |
| Vessels: | | | | | | |
| Motor | | | | 6 | | |
| Net tonnage | | | | 48 | | |
| Boats: | | | | | | |
| Motor | 106 | 63 | 4 | 7 | 56 | |
| Other | | 157 | 9 | | 53 | |
| Apparatus: | | | | | | |
| Number | 106 | 271 | 13 | 64 | 100 | 30 |
| Square yards | 199,192 | 91,302 | | | | |
| Hooks | | | 1,300 | 224 | | |

*Fisheries of the coastal district of Washington, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Drag bag nets | Traps, crab | Tongs and rakes | Shovels | Spears | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 2 | | | 14 |
| On boats and shore | 8 | 121 | 21 | 2,664 | 14 | 2,786 |
| Total | 8 | 121 | 23 | 2,664 | 14 | 2,800 |
| Vessels. | | | | | | |
| Motor | | | 1 | | | 7 |
| Net tonnage | | | 8 | | | 56 |
| Boats. | | | | | | |
| Motor | 2 | 112 | 8 | | | 301 |
| Other | | 9 | 17 | | | 234 |
| Apparatus: | | | | | | |
| Number | 2 | 4,095 | 27 | 2,664 | 14 | |
| Length, yards | 120 | | | | | |

CATCH: BY GEAR

| Species | Gill nets | | | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | Drift | | Set [1] | | Set | | Troll | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Carp | | | 6,483 | $194 | | | | |
| Halibut | | | | | | | 3,518 | $340 |
| "Lingcod" | | | | | | | 61,097 | 611 |
| Perch | | | | | 1,432 | $43 | | |
| Rockfishes | | | | | | | 19,970 | 178 |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | | | 1,393,838 | 204,894 | | | | |
| Chinook or king | 286,097 | $13,160 | 86,411 | 3,975 | | | 841,024 | 100,763 |
| Chum or keta | 135,684 | 678 | 374,940 | 1,875 | | | | |
| Silver or coho | 291,060 | 11,351 | 572,650 | 22,333 | | | 535,925 | 31,347 |
| Steelhead trout | 340 | 22 | 103,340 | 6,820 | | | | |
| Sturgeon | 7,470 | 224 | | | | | | |
| Total | 720,651 | 25,435 | 2,537,662 | 240,091 | 1,432 | 43 | 1,461,534 | 133,239 |

| Species | Pound nets | | Dip nets | | Drag bag nets | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Salmon: | | | | | | |
| Chinook or king | 182,597 | $8,399 | | | | |
| Chum or keta | 872,220 | 4,361 | | | | |
| Silver or coho | 648,220 | 25,281 | | | | |
| Smelt | | | 105,600 | $5,280 | 10,040 | $502 |
| Steelhead trout | 5,230 | 345 | | | | |
| Total | 1,708,267 | 38,386 | 105,600 | 5,280 | 10,040 | 502 |

| Species | Traps | | Tongs and rakes | | Shovels | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH | | | | | | |
| Crabs | 1,379,160 | $91,714 | | | | |
| Clams: | | | | | | |
| Hard | | | | | 6,765 | $840 |
| Razor | | | | | 799,516 | 152,130 |
| Oysters: | | | | | | |
| Eastern, market | | | 1,970 | $1,851 | | |
| Japanese, market | | | 158,672 | 49,412 | | |
| Native, market | | | 8,193 | 6,098 | | |
| Total | 1,379,160 | 91,714 | 168,835 | 57,361 | 806,281 | 152,970 |

[1] Includes catch by spears.

*Fisheries of the Columbia River district of Washington, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | Lines | | Pound nets | Fish wheels | Dip nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | Drift, salmon | Set, salmon | Set | Troll | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | | 12 | | | | 12 |
| On boats and shore | 498 | 720 | 106 | 29 | 202 | 208 | 26 | 122 | 1,747 |
| Total | 498 | 720 | 106 | 29 | 214 | 208 | 26 | 122 | 1,759 |
| Vessels: | | | | | | | | | |
| Motor | | | | | 6 | | | | 6 |
| Net tonnage | | | | | 53 | | | | 53 |
| Boats: | | | | | | | | | |
| Motor | 44 | 543 | 60 | 20 | 166 | 141 | | 68 | 890 |
| Other | 62 | | 46 | 8 | | 124 | | | 231 |
| Apparatus: | | | | | | | | | |
| Number | 57 | 543 | 271 | 55 | 724 | 381 | 39 | 122 | |
| Length, yards | 16,044 | | | | | | | | |
| Square yards | | 1,292,883 | 66,124 | | | | | | |
| Hooks | | | | 5,500 | 3,258 | | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | | | Lines—Set | |
|---|---|---|---|---|---|---|---|---|
| | | | Drift | | Set | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Carp | 208,246 | $6,247 | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 38,596 | 6,561 | 78,907 | $13,414 | 9,297 | $1,580 | | |
| Chinook or king | 897,786 | 114,019 | 3,119,732 | 393,086 | 65,205 | 8,216 | 373 | $47 |
| Chum or keta | 14,447 | 72 | 187,761 | 938 | 2,977 | 15 | | |
| Silver or coho | 17,147 | 823 | 188,789 | 9,062 | 2,754 | 132 | | |
| Shad | 331,169 | 6,623 | 58,823 | 1,176 | 1,441 | 29 | | |
| Steelhead trout | 255,355 | 21,705 | 397,104 | 33,754 | 48,551 | 4,127 | | |
| Sturgeon | 10,059 | 432 | 24,029 | 1,033 | 4,908 | 211 | 1,972 | 85 |
| Total | 1,772,805 | 156,482 | 4,055,145 | 452,463 | 135,133 | 14,310 | 2,345 | 132 |

| Species | Lines—Troll | | Pound nets | | Fish wheels | | Dip nets | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | | | 82,662 | $14,053 | 54,934 | $9,339 | 30,636 | $5,208 |
| Chinook or king | 385,302 | $55,483 | 2,284,487 | 249,009 | 173,537 | 21,866 | 153,793 | 19,378 |
| Chum or keta | | | 368,014 | 1,840 | 1,024 | 5 | 5,619 | 28 |
| Silver or coho | 1,594,381 | 98,852 | 1,036,224 | 44,558 | 2,596 | 112 | 3,920 | 169 |
| Shad | | | 121,751 | 2,435 | 18,631 | 373 | | |
| Smelt | | | | | | | 1,607,416 | 24,111 |
| Steelhead trout | 260 | 22 | 1,061,073 | 89,130 | 26,861 | 2,256 | 80,872 | 6,793 |
| Sturgeon | | | 10,523 | 452 | 3,130 | 135 | 39 | 2 |
| Total | 1,979,943 | 154,357 | 4,964,734 | 401,477 | 280,713 | 34,086 | 1,882,295 | 55,689 |

*Industries related to the fisheries of Washington, 1930*

TRANSPORTING

| Item | Puget Sound district | Coastal district | Columbia River district | Total |
|---|---|---|---|---|
| Persons engaged on vessels | 137 | 2 | 21 | 160 |
| Vessels motor: | | | | |
| 5 to 10 tons | 8 | 2 | 10 | 20 |
| 11 to 20 tons | 14 | | 2 | 16 |
| 21 to 30 tons | 13 | | | 13 |
| 31 to 40 tons | 8 | | | 8 |
| 41 to 50 tons | 5 | | | 5 |
| 51 to 60 tons | 1 | | | 1 |
| 81 to 90 tons | 1 | | | 1 |
| Total | 50 | 2 | 12 | 64 |
| Net tonnage | 1,291 | 16 | 118 | 1,425 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| | | | | |
|---|---|---|---|---|
| Establishments | 64 | 32 | 10 | 106 |
| Persons engaged: | | | | |
| Proprietors | 84 | 34 | 7 | 125 |
| Salaried employees | 146 | 26 | 22 | 194 |
| Wage earners— | | | | |
| Average for season | 1,428 | 437 | 269 | 2,134 |
| Average for year | 775 | 76 | 131 | 982 |
| Paid to salaried employees | $521,037 | $63,324 | $64,875 | $649,236 |
| Paid to wage earners | 893,984 | 90,290 | 164,392 | 1,148,666 |
| Total salaries and wages | 1,415,021 | 153,614 | 229,267 | 1,797,902 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Cod: | | | |
| Salted [1] | pounds | 3,092,877 | $151,190 |
| Salted, packaged | do | 662,250 | [2] 88,904 |
| Halibut steaks | do | 89,938 | 15,105 |
| Herring, spiced | do | 18,300 | 3,480 |
| Sablefish, salted | do | 118,509 | 8,872 |
| Salmon: | | | |
| Fresh steaks | do | 34,917 | 5,565 |
| Mild-cured | do | 4,124,000 | 884,514 |
| Salted | do | 45,346 | 4,929 |
| Kippered (chinook) | do | 2,371,258 | 479,347 |
| Smoked | do | 126,062 | 33,327 |
| Canned— | | | |
| Blueback, red or sockeye | standard cases | 376,244 | 5,074,410 |
| Chinook or king | do | 101,018 | 1,592,754 |
| Chum or keta | do | 79,763 | 284,531 |
| Humpback or pink | do | 3,712 | 23,702 |
| Silver or coho | do | 141,541 | 1,294,363 |
| Steelhead trout | do | 6,457 | 86,917 |
| Eggs— | | | |
| For food | do | 1,667 | 15,683 |
| For bait | do | 2,837 | 76,931 |
| Shad: | | | |
| Canned | do | 3,088 | 8,958 |
| Roe, canned | do | 113 | 3,616 |
| Clams: | | | |
| Hard— | | | |
| Fresh-shucked | gallons | 4,100 | 6,211 |
| Canned, whole, minced, and juice | standard cases | 17,856 | 78,353 |
| Razor— | | | |
| Canned, whole, minced, chowder, and juice | do | 45,153 | 416,349 |

[1] The cod were salted in Alaskan waters.
[2] This figure is included in the total, however, it should be explained that it represents a further manufacture of salted cod already included in the table.

*Industries related to the fisheries of Washington, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED—Continued

| Item | | Quantity | Value |
|---|---|---|---|
| Oysters: | | | |
| Western, fresh-shucked | gallons | 28,375 | $225,241 |
| Japanese, fresh-shucked | do | 25,000 | 87,500 |
| Unclassified products | | | |
| Packaged [3] | | (4) | 47,992 |
| Canned [5] | standard cases | 312 | 4,420 |
| Meal, salmon and halibut [6] | tons | 1,050 | 70,071 |
| Oil, salmon and halibut | gallons | 122,458 | 29,973 |
| Miscellaneous [7] | | (4) | 47,283 |
| Total | | | 11,150,491 |

[3] Includes fresh and frozen steaks of "lingcod" and rockfish; packaged fresh crab meat; and fresh-shucked eastern oysters and scallops.
[4] Data not available.
[5] Includes canned herring for bait and dog and cat food.
[6] Includes small amount of salmon-egg meal.
[7] Includes canned sturgeon and crabs; smoked herring; kippered sablefish; and mild-cured shad.

NOTE.—Some of the above products may be have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State.

## OREGON

*Fisheries of Oregon, 1930*

CATCH: BY DISTRICTS

| Species | Columbia River district | | Coastal district | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| FISH | | | | |
| Flounders: | | | | |
| "Sole" | 3,272 | $125 | 4,451 | $132 |
| Other | | | 37,722 | 1,220 |
| Hake | | | 265 | 3 |
| Halibut | 137,069 | 17,623 | 275,575 | 29,860 |
| Herring | | | 138,756 | 2,408 |
| "Lingcod" | 53,907 | 1,868 | 133,603 | 2,727 |
| Perch | | | 42,405 | 945 |
| Rockfishes | 26,080 | 768 | 92,608 | 2,654 |
| Sablefish | 83,645 | 3,017 | 106,624 | 3,192 |
| Salmon: | | | | |
| Blueback, red or sockeye | 279,674 | 47,575 | | |
| Chinook or king | 10,548,627 | 1,334,326 | 1,315,782 | 112,330 |
| Chum or keta | 318,771 | 1,594 | 266,843 | 1,334 |
| Silver or coho | 3,580,402 | 210,810 | 4,555,529 | 217,368 |
| Shad | 832,518 | 16,651 | 479,327 | 9,589 |
| Smelt | 188,229 | 3,893 | 5,943 | 326 |
| Steelhead trout | 1,488,220 | 126,124 | 391,353 | 26,395 |
| Striped bass | | | 15,664 | 1,942 |
| Sturgeon | 74,581 | 3,207 | 4,201 | 182 |
| Tuna, albacore | 255 | 33 | 2,911 | 207 |
| Total | 17,615,250 | 1,767,614 | 7,869,562 | 412,814 |
| SHELLFISH | | | | |
| Crabs | | | 725,532 | 44,106 |
| Crawfish | 176,800 | 17,680 | | |
| Clams: | | | | |
| Razor | | | 38,372 | 7,197 |
| Soft | | | 25,068 | 1,567 |
| Oysters, native, market | | | 8,177 | 5,310 |
| Total | 176,800 | 17,680 | 797,149 | 58,180 |
| Grand total | 17,792,050 | 1,785,294 | 8,666,711 | 470,994 |

*Fisheries of the Columbia River district of Oregon, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | Lines | | Pound nets | Dip nets | Traps, crawfish | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | Drift, salmon | Set, salmon | Trawl and set | Troll | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | | | 22 | 44 | | | | 66 |
| On boats and shore | 530 | 1,310 | 86 | 58 | 290 | 37 | 184 | 58 | 2,456 |
| Total | 530 | 1,310 | 86 | 80 | 334 | 37 | 184 | 58 | 2,522 |
| Vessels, motor | | | | 6 | 22 | | | | 28 |
| Net tonnage | | | | 65 | 217 | | | | 282 |
| Boats: | | | | | | | | | |
| Motor | 32 | 921 | 84 | 46 | 248 | 22 | | 46 | 1,315 |
| Other | 46 | | 3 | 12 | | 18 | | 12 | 86 |
| Apparatus: | | | | | | | | | |
| Number | 41 | 921 | 183 | 392 | 1,201 | 61 | 184 | 986 | |
| Length, yards | 23,273 | | | | | | | | |
| Square yards | | 2,910,360 | 47,580 | | | | | | |
| Hooks | | | | 39,200 | 5,400 | | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | Lines—Trawl and set | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Flounders; "Sole" | | | | | 3,272 | $123 |
| Halibut | | | | | 137,069 | 17,623 |
| "Lingcod" | | | | | 53,907 | 1,868 |
| Rockfishes | | | | | 26,080 | 768 |
| Sablefish | | | | | 83,645 | 3,017 |
| Salmon: | | | | | | |
| Blueback, red or sockeye | 76,154 | $12,946 | 165,579 | $28,179 | | |
| Chinook or king | 1,887,311 | 237,801 | 7,428,041 | 935,933 | | |
| Chum or keta | 23,827 | 119 | 252,314 | 1,262 | | |
| Silver or coho | 49,488 | 2,375 | 353,808 | 16,983 | | |
| Shad | 626,937 | 12,539 | 157,645 | 3,153 | | |
| Smelt | | | 53,500 | 1,872 | | |
| Steelhead trout | 479,589 | 40,765 | 631,949 | 53,716 | | |
| Sturgeon | 1,556 | 67 | 41,181 | 1,771 | 29,491 | 1,268 |
| Tuna, albacore | | | | | 255 | 33 |
| Total | 3,144,862 | 306,612 | 9,084,017 | 1,042,869 | 333,719 | 24,702 |

| Species | Lines—Troll | | Pound nets | | Dip nets | | Traps | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | | | 23,077 | $3,923 | 14,864 | $2,527 | | |
| Chinook or king | 624,179 | $89,882 | 355,078 | 38,704 | 254,018 | 32,006 | | |
| Chum or keta | | | 41,357 | 207 | 1,273 | 6 | | |
| Silver or coho | 2,886,150 | 178,941 | 287,606 | 12,367 | 3,350 | 144 | | |
| Shad | | | 47,851 | 957 | 85 | 2 | | |
| Smelt | | | | | 134,729 | 2,021 | | |
| Steelhead trout | 1,066 | 91 | 296,533 | 24,909 | 79,083 | 6,643 | | |
| Sturgeon | | | 1,739 | 75 | 614 | 26 | | |
| SHELLFISH | | | | | | | | |
| Crawfish | | | | | | | 176,800 | $17,680 |
| Total | 3,511,395 | 268,914 | 1,053,241 | 81,142 | 488,016 | 43,375 | 176,800 | 17,680 |

*Fisheries of the coastal district of Oregon, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | Lines | | Traps, crab | Tongs | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | Drift, salmon | Set, salmon | Trawl and set | Troll | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 6 | 12 | | | | 16 |
| On boats and shore | 6 | 640 | 319 | 2 | 138 | 223 | 2 | 246 | 1,345 |
| Total | 6 | 640 | 319 | 8 | 150 | 223 | 2 | 246 | 1,361 |
| Vessels: | | | | | | | | | |
| Motor | | | | 2 | 6 | | | | 7 |
| Net tonnage | | | | 24 | 47 | | | | 63 |
| Boats: | | | | | | | | | |
| Motor | 2 | 472 | 174 | 1 | 116 | 198 | 1 | | 863 |
| Other | 2 | 7 | 161 | | | 25 | 2 | | 187 |
| Apparatus: | | | | | | | | | |
| Number | 2 | 479 | 941 | 95 | 517 | 6,690 | 2 | 246 | |
| Length, yards | 866 | | | | | | | | |
| Square yards | | 602,920 | 151,181 | | | | | | |
| Hooks | | | | 9,500 | 2,326 | | | | |

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Trawl and set | | Troll | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Flounders: | | | | | | | | |
| "Sole" | 475 | $12 | | | 3,976 | $120 | | |
| Other | 6,104 | 232 | 19,321 | $563 | 12,297 | 425 | | |
| Hake | 265 | 3 | | | | | | |
| Halibut | | | | | 273,698 | 29,663 | 1,877 | $197 |
| Herring | 6,822 | 120 | 131,934 | 2,288 | | | | |
| "Lingcod" | | | | | 91,132 | 1,863 | 42,471 | 864 |
| Perch | 3,229 | 98 | 39,176 | 847 | | | | |
| Rockfishes | | | | | 71,722 | 2,084 | 20,886 | 570 |
| Sablefish | | | | | 106,624 | 3,192 | | |
| Salmon: | | | | | | | | |
| Chinook or king | | | 1,035,324 | 85,686 | | | 280,458 | 26,664 |
| Chum or keta | | | 266,813 | 1,334 | | | | |
| Silver or coho | | | 2,957,095 | 119,864 | | | 1,598,434 | 97,504 |
| Shad | | | 479,327 | 9,589 | | | | |
| Smelt | 856 | 43 | 5,087 | 283 | | | | |
| Steelhead trout | | | 390,348 | 26,325 | | | 1,005 | 70 |
| Striped bass | 614 | 74 | 15,050 | 1,868 | | | | |
| Sturgeon | | | 4,158 | 179 | 20 | 2 | 23 | 1 |
| Tuna, albacore | | | | | 20 | 2 | 2,891 | 205 |
| Total | 18,365 | 582 | 5,343,663 | 248,826 | 559,489 | 37,351 | 1,948,045 | 126,055 |

| Species | Traps | | Tongs | | Shovels | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH | | | | | | |
| Crabs | 725,532 | $44,106 | | | | |
| Clams: | | | | | | |
| Razor | | | | | 38,372 | $7,197 |
| Soft | | | | | 25,068 | 1,567 |
| Oysters, native, market | | | 8,177 | $5,310 | | |
| Total | 725,532 | 44,106 | 8,177 | 5,310 | 63,440 | 8,764 |

*Industries related to the fisheries of Oregon, 1930*

TRANSPORTING IN COLUMBIA RIVER DISTRICT

| | |
|---|---|
| Persons engaged on vessels | 48 |
| Vessels, motor: | |
| 5 to 10 tons | 18 |
| 11 to 20 tons | 9 |
| Total | 27 |
| Net tonnage | 286 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Columbia River district | Coastal district | Total |
|---|---|---|---|
| Establishments | 35 | 19 | 54 |
| Persons engaged: | | | |
| Proprietors | 32 | 15 | 47 |
| Salaried employees | 56 | 17 | 73 |
| Wage earners— | | | |
| Average for season | 660 | 74 | 734 |
| Average for year | 409 | 50 | 459 |
| Paid to salaried employees | $199,844 | $55,685 | $255,529 |
| Paid to wage earners | 478,246 | 59,203 | 537,449 |
| Total salaries and wages | 678,090 | 114,888 | 792,978 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Salmon: | | | |
| Mild-cured | pounds | 546,150 | $123,317 |
| Canned— | | | |
| Blueback, red or sockeye | standard cases | 5,923 | 124,383 |
| Chinook or king | do | 206,276 | 3,227,599 |
| Chum or keta | do | 8,649 | 29,671 |
| Silver or coho | do | 106,868 | 1,138,930 |
| Steelhead | do | 11,588 | 183,496 |
| Shad: | | | |
| Canned | do | 7,364 | 26,114 |
| Roe, canned | do | 813 | 26,004 |
| Crab meat, packaged (fresh-cooked) | pounds | 126,475 | 59,365 |
| Clams, razor: Canned, whole, minced, and juice | standard cases | 956 | 8,631 |
| Oysters, western, fresh-shucked | gallons | 9,530 | 70,884 |
| Other products [1] | | (2) | 69,432 |
| Total | | | 5,087,826 |

[1] Includes salted sablefish; canned crabs; fresh-shucked eastern and Japanese oysters; canned salmon eggs (for bait); salmon meal; and salmon oil.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State.

## CALIFORNIA

*Fisheries of California, 1930*

CATCH: BY DISTRICTS

| Species | Northern district | | San Francisco district | | Monterey district | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Anchovies | | | 261,850 | $3,142 | 43,500 | $749 |
| Barracuda | | | | | 30 | 3 |
| Carp | | | 67,012 | 1,315 | | |
| Catfish | 43,343 | $6,401 | 389,848 | 51,827 | | |
| Cod | | | 9,259,119 | 150,928 | | |
| Eels | | | 10 | 1 | | |
| Flounders: | | | | | | |
| "California halibut" | | | | | 24,412 | 2,799 |
| "Sole" | 1,569,399 | 95,889 | 8,059,671 | 493,201 | 904,119 | 53,843 |
| Other | 82,203 | 3,489 | 815,450 | 34,064 | 104,739 | 4,477 |
| Grayfish | 2,345 | 23 | 221,672 | 2,212 | 8,925 | 89 |
| Hake | | | 50,983 | 510 | 5,105 | 51 |
| Halibut | 413,958 | 46,519 | 31,119 | 2,955 | | |
| Hardhead | | | 38,857 | 5,257 | | |
| Herring | 103,183 | 1,692 | 601,927 | 5,437 | | |
| Horse mackerel | | | | | 95,271 | 1,030 |
| Kingfish | | | 40,337 | 1,230 | 124,607 | 4,286 |
| "Lingcod" | 511,979 | 20,067 | 581,902 | 24,514 | 196,354 | 10,150 |
| Mackerel | | | 12,362 | 371 | 1,363,106 | 42,489 |
| Perch | 32,426 | 1,296 | 112,486 | 5,639 | 14,957 | 694 |
| Pilchard or sardine | | | 48,468,957 | 195,812 | 259,097,933 | 1,177,617 |
| Pompano | | | | | 516 | 214 |
| Rock bass | | | | | 16 | 1 |
| Rockfishes | 253,568 | 8,480 | 1,027,496 | 34,321 | 2,825,970 | 98,261 |
| Sablefish | 627,051 | 26,387 | 461,348 | 12,421 | 267,589 | 8,366 |
| Salmon | 3,501,539 | 287,900 | 2,221,940 | 209,336 | 279,409 | 31,528 |
| Sculpin | 229 | 5 | | | 817 | 21 |
| Sea bass, white or squeteague | 216 | 7 | 48,334 | 3,513 | 45,677 | 3,069 |
| Shad | | | 1,199,459 | 45,314 | | |
| Skates | 3,030 | 61 | 221,324 | 4,426 | 28,871 | 570 |
| Smelt | 72,893 | 4,528 | 198,406 | 10,937 | 339,963 | 18,105 |
| Splittail | | | 18,528 | 555 | | |
| Squawfish | | | 5,207 | 300 | | |
| Striped bass | | | 866,808 | 90,387 | | |
| Suckers | | | 1,990 | 100 | | |
| Tomcod | 712 | 28 | 22,460 | 898 | | |
| Tuna and tunalike fishes: | | | | | | |
| Albacore | | | | | 172,962 | 12,570 |
| Bonito | | | | | 1,166 | 58 |
| Whitebait | 144,754 | 8,974 | 31,633 | 2,688 | 2,996 | 261 |
| Other fish | 70,343 | 1,677 | 12,156 | 277 | 12,731 | 528 |
| Total | 7,433,171 | 513,423 | 75,350,651 | 1,393,888 | 265,961,741 | 1,471,829 |
| SHELLFISH, ETC. | | | | | | |
| Crabs | 92,448 | 9,638 | 1,898,832 | 230,083 | 1,104 | 162 |
| Shrimp | | | 2,687,831 | 40,318 | 8,736 | 1,954 |
| Abalone | | | | | 631,795 | 126,359 |
| Clams: | | | | | | |
| Cockle | 7 | 2 | 21,534 | 7,594 | | |
| Pismo | | | | | 2,409 | 1,230 |
| Soft | | | 37,303 | 9,474 | | |
| Mixed | 4,916 | 1,028 | 246 | 70 | | |
| Mussels | | | 3 | 1 | 30 | 5 |
| Octopus | 5,141 | 410 | 8,578 | 740 | 63,003 | 6,069 |
| Oysters: | | | | | | |
| Eastern, market | | | 72,796 | 29,118 | | |
| Native, market | | | 4,949 | 3,093 | | |
| Squid | | | | | 10,937,974 | 115,614 |
| Terrapin | | | 58 | 7 | | |
| Total | 102,512 | 11,078 | 4,732,130 | 320,498 | 11,645,051 | 251,393 |
| WHALE PRODUCTS | | | | | | |
| Whale oil | | | 3,844,209 | 166,953 | | |
| Grand total | 7,535,683 | 524,501 | 83,926,990 | 1,881,339 | 277,606,792 | 1,723,222 |

*Fisheries of California, 1930*—Continued

CATCH: BY DISTRICTS—Continued

| Species | Southern district—Off California | | | |
|---|---|---|---|---|
| | San Pedro division | | San Diego division | |
| | Pounds | Value | Pounds | Value |
| FISH | | | | |
| Anchovies | 10,311 | $284 | 3,900 | $39 |
| Barracuda | 2,554,875 | 186,151 | 958,703 | 63,107 |
| Cabrilla | | | 471 | 17 |
| Carp | 2,375 | 175 | | |
| Eels | 10 | 1 | | |
| Flounders: | | | | |
| "California halibut" | 731,066 | 93,132 | 109,465 | 11,829 |
| "Sole" | 379,366 | 16,324 | 6,498 | 583 |
| Other | 17,341 | 728 | 43 | 3 |
| Flyingfish | 48,458 | 1,805 | | |
| Grayfish | 288,167 | 8,703 | 124,633 | 582 |
| Halfmoon | 36,765 | 2,720 | | |
| Herring | 259 | 13 | 43,579 | 565 |
| Horse mackerel | 273,557 | 10,112 | | |
| Kingfish | 289,743 | 5,548 | 2,471 | 79 |
| "Lingcod" | 3,408 | 178 | | |
| Mackerel | 14,473,352 | 184,846 | 681,280 | 13,840 |
| Mullet | 11,096 | 1,055 | 9,657 | 858 |
| Perch | 104,431 | 3,444 | 3,377 | 98 |
| Pilchard or sardine | 182,711,875 | 977,784 | 4,171,982 | 26,219 |
| Pompano | 1,351 | 757 | 356 | 142 |
| Rock bass | 345,636 | 24,459 | 130,020 | 5,644 |
| Rockfishes | 2,044,311 | 89,218 | 1,053,604 | 50,445 |
| Sablefish | 5,506 | 405 | | |
| Salmon | 6 | 1 | | |
| Sculpin | 65,567 | 7,009 | 23,043 | 1,982 |
| Sea bass: | | | | |
| Black | 103,246 | 5,292 | 84,227 | 3,690 |
| White or squeteague | 886,685 | 80,406 | 258,373 | 18,818 |
| Sheepshead | 203,593 | 7,470 | 37,461 | 1,454 |
| Skates | 31,410 | 662 | 1,755 | 34 |
| Smelt | 431,409 | 19,874 | 13,927 | 739 |
| Swordfish | 196,425 | 26,609 | 365,070 | 48,732 |
| Tuna and tunalike fishes: | | | | |
| Albacore | 107,987 | 10,857 | 2,168 | 224 |
| Bluefin | 15,443,346 | 881,976 | 155,546 | 8,556 |
| Bonito | 2,624,642 | 83,143 | 1,240,688 | 38,363 |
| Skipjack or striped tuna | 1,109,680 | 44,387 | 1,905,595 | 76,224 |
| Yellowfin | 12,564 | 795 | 22,989 | 1,379 |
| Whitebait | 55 | 4 | | |
| Whitefish | 115,299 | 8,630 | 99,267 | 3,836 |
| Yellowtail | 241,838 | 13,498 | 973,121 | 39,069 |
| Other fish | 33,990 | 2,338 | | |
| Total | 225,941,001 | 2,800,793 | 12,483,269 | 417,150 |
| SHELLFISH, ETC. | | | | |
| Crabs | 12 | 3 | | |
| Sea crawfish or spiny lobster | 267,670 | 53,160 | 106,780 | 21,074 |
| Abalone | 15,521 | 3,972 | | |
| Clams: | | | | |
| Cockle | 8,510 | 2,063 | | |
| Pismo | 19,363 | 8,380 | | |
| Octopus | 258 | 46 | | |
| Squid | 30,376 | 1,672 | 1,112 | 86 |
| Total | 341,710 | 69,296 | 107,892 | 21,160 |
| Grand total | 226,282,711 | 2,870,089 | 12,591,161 | 438,310 |

*Fisheries of California, 1930*—Continued

CATCH: BY DISTRICTS—Continued

| Species | Southern district—Off Latin America | | | | Total southern district | |
|---|---|---|---|---|---|---|
| | San Pedro division | | San Diego division | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Anchovies | | | | | 14,211 | $323 |
| Barracuda | 937,715 | $96,374 | 312,443 | $33,487 | 4,763,736 | 379,119 |
| Cabrilla | 387,394 | 22,545 | 121,674 | 4,528 | 509,539 | 27,090 |
| Carp | | | | | 2,375 | 175 |
| Eels | | | | | 10 | 1 |
| Flounders: | | | | | | |
| "California halibut" | 12,562 | 1,234 | 189,136 | 19,936 | 1,042,229 | 126,131 |
| "Sole" | | | | | 385,864 | 16,907 |
| Other | 100 | 7 | | | 17,484 | 738 |
| Flyingfish | | | | | 48,458 | 1,805 |
| Grayfish | 1,555 | 62 | | | 414,355 | 9,347 |
| Halfmoon | | | | | 36,765 | 2,720 |
| Herring | | | | | 43,838 | 578 |
| Horse mackerel | | | | | 273,557 | 10,112 |
| Kingfish | | | | | 292,214 | 5,627 |
| "Lingcod" | | | | | 3,408 | 178 |
| Mackerel | | | 1,264 | 23 | 15,155,896 | 198,709 |
| Mullet | 554 | 37 | | | 21,307 | 1,950 |
| Perch | 660 | 30 | | | 108,468 | 3,572 |
| Pilchard or sardine | | | | | 186,883,857 | 1,004,003 |
| Pompano | | | | | 1,707 | 899 |
| Rock bass | 13,972 | 822 | 18,519 | 1,491 | 508,147 | 32,416 |
| Rockfishes | | | 8,405 | 429 | 3,106,320 | 140,092 |
| Sablefish | | | | | 5,506 | 405 |
| Salmon | | | | | 6 | 1 |
| Sculpin | | | | | 88,610 | 8,991 |
| Sea bass: | | | | | | |
| Black | 71,152 | 3,818 | 135,384 | 7,078 | 394,009 | 19,878 |
| White or squeteague | 128,193 | 14,426 | 258,944 | 24,243 | 1,532,195 | 137,893 |
| Sheepshead | 377 | 15 | 2,258 | 96 | 243,689 | 9,035 |
| Skates | | | | | 33,165 | 696 |
| Smelt | | | 1,082 | 79 | 446,418 | 20,692 |
| Spanish mackerel | 19,620 | 1,284 | 23,345 | 757 | 42,965 | 2,041 |
| Swordfish | | | 1,234 | 154 | 562,729 | 75,495 |
| Tuna and tunalike fishes: | | | | | | |
| Albacore | | | | | 110,155 | 11,081 |
| Bluefin | 6,150,000 | 338,341 | 172,390 | 9,144 | 21,921,282 | 1,238,017 |
| Bonito | 1,214,567 | 42,123 | 83,197 | 2,879 | 5,163,094 | 166,508 |
| Skipjack or striped tuna | 5,737,340 | 203,878 | 11,732,972 | 465,347 | 20,485,587 | 789,836 |
| Yellowfin | 12,537,771 | 754,534 | 44,080,857 | 2,639,509 | 56,654,181 | 3,396,217 |
| Whitebait | | | | | 55 | 4 |
| Whitefish | 360 | 24 | 10,176 | 470 | 225,102 | 12,960 |
| Yellowtail | 2,414,674 | 111,829 | 1,140,795 | 45,380 | 4,770,428 | 209,776 |
| Other fish | 4,874 | 236 | | | 38,864 | 2,574 |
| Total | 29,633,440 | 1,591,619 | 58,294,075 | 3,255,030 | 326,351,785 | 8,064,592 |
| SHELLFISH, ETC. | | | | | | |
| Crabs | | | | | 12 | 3 |
| Sea crawfish or spiny lobster | | | 1,019,689 | 188,911 | 1,394,139 | 263,145 |
| Abalone | | | | | 15,521 | 3,972 |
| Clams: | | | | | | |
| Cockle | | | | | 8,510 | 2,063 |
| Pismo | | | | | 19,363 | 8,380 |
| Octopus | | | | | 258 | 46 |
| Squid | | | | | 31,488 | 1,758 |
| Turtles | | | 580 | 58 | 580 | 58 |
| Total | | | 1,020,269 | 188,969 | 1,469,871 | 279,425 |
| Grand total | 29,633,440 | 1,591,619 | 59,314,344 | 3,443,999 | 327,821,656 | 8,344,017 |

*Fisheries of California, 1930*—Continued

CATCH: BY WATERS

| Species | Off California [1] | | Off Latin America | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| FISH | | | | |
| Anchovies | 319,561 | $4,214 | | |
| Barracuda | 3,513,608 | 249,261 | 1,250,158 | $129,861 |
| Cabrillo | 471 | 17 | 509,068 | 27,073 |
| Carp | 69,387 | 1,490 | | |
| Catfish | 433,191 | 58,228 | | |
| Cod | 9,259,119 | 150,928 | | |
| Eels | 20 | 2 | | |
| Flounders: | | | | |
| "California halibut" | 864,943 | 107,760 | 201,698 | 21,170 |
| "Sole" | 10,919,053 | 659,840 | | |
| Other | 1,019,776 | 42,761 | 100 | 7 |
| Flyingfish | 48,458 | 1,805 | | |
| Grayfish | 645,742 | 11,609 | 1,555 | 62 |
| Hake | 56,088 | 561 | | |
| Halfmoon | 36,765 | 2,720 | | |
| Halibut | 445,077 | 49,474 | | |
| Hardhead | 38,857 | 5,257 | | |
| Herring | 748,948 | 7,707 | | |
| Horse mackerel | 368,828 | 11,142 | | |
| Kingfish | 457,158 | 11,143 | | |
| "Lingcod" | 1,293,643 | 54,909 | | |
| Mackerel | 16,530,100 | 241,546 | 1,264 | 23 |
| Mullet | 20,753 | 1,913 | 554 | 37 |
| Perch | 267,677 | 11,171 | 660 | 30 |
| Pilchard or sardine | 494,450,747 | 2,377,432 | | |
| Pompano | 2,223 | 1,113 | | |
| Rock bass | 475,672 | 30,104 | 32,491 | 2,313 |
| Rockfishes | 7,204,949 | 280,725 | 8,405 | 429 |
| Sablefish | 1,361,494 | 47,579 | | |
| Salmon | 6,002,894 | 528,765 | | |
| Sculpin | 89,656 | 9,017 | | |
| Sea bass: | | | | |
| Black | 187,473 | 8,982 | 206,536 | 10,896 |
| White or squeteague | 1,239,285 | 105,813 | 387,137 | 38,669 |
| Shad | 1,199,459 | 45,314 | | |
| Sheepshead | 241,054 | 8,924 | 2,635 | 111 |
| Skates | 286,390 | 5,753 | | |
| Smelt | 1,056,598 | 54,183 | 1,082 | 79 |
| Spanish mackerel | | | 42,965 | 2,041 |
| Splittail | 18,528 | 555 | | |
| Squawfish | 5,207 | 300 | | |
| Striped bass | 866,808 | 90,387 | | |
| Suckers | 1,990 | 100 | | |
| Swordfish | 561,495 | 75,341 | 1,234 | 154 |
| Tomcod | 23,172 | 926 | | |
| Tuna and tunalike fishes: | | | | |
| Albacore | 283,117 | 23,651 | | |
| Bluefin | 15,598,892 | 890,532 | 6,322,390 | 347,485 |
| Bonito | 3,866,496 | 121,564 | 1,297,764 | 45,002 |
| Skipjack or striped tuna | 3,015,275 | 120,611 | 17,470,312 | 669,225 |
| Yellowfin | 35,553 | 2,174 | 56,618,628 | 3,394,043 |
| Whitebait | 179,438 | 11,927 | | |
| Whitefish | 214,566 | 12,466 | 10,536 | 494 |
| Yellowtail | 1,214,959 | 52,567 | 3,555,469 | 157,209 |
| Other fish | 129,220 | 4,820 | 4,874 | 236 |
| Total | 587,169,833 | 6,597,083 | 87,927,515 | 4,846,649 |
| SHELLFISH, ETC. | | | | |
| Crabs | 1,992,396 | 239,886 | | |
| Shrimp | 2,696,567 | 42,272 | | |
| Sea crawfish or spiny lobster | 374,450 | 74,234 | 1,019,689 | 188,911 |
| Abalone | 647,316 | 130,331 | | |
| Clams: | | | | |
| Cockle | 30,051 | 9,659 | | |
| Pismo | 21,772 | 9,610 | | |
| Soft | 37,303 | 9,474 | | |
| Mixed | 5,162 | 1,098 | | |
| Mussels | 33 | 6 | | |
| Octopus | 76,980 | 7,265 | | |
| Oysters: | | | | |
| Eastern, market | 72,796 | 29,118 | | |
| Native, market | 4,949 | 3,093 | | |

[1] The catch of cod was taken in Alaska waters.

*Fisheries of California, 1930*—Continued

CATCH: BY WATERS—Continued

| Species | Off California | | Off Latin America | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC.—continued | | | | |
| Squid | 10,969,462 | $117,372 | | |
| Terrapin | 58 | 7 | | |
| Turtles | | | 580 | $58 |
| Total | 16,929,295 | 673,425 | 1,020,269 | 188,969 |
| WHALE PRODUCTS | | | | |
| Whale oil | 3,844,209 | 166,953 | | |
| Grand total | 607,943,337 | 7,437,461 | 88,947,784 | 5,035,618 |

*Fisheries of the northern district of California, 1930*

OPERATING UNITS: BY GEAR

| Item | Haul seines | Gill nets | | Lines | |
|---|---|---|---|---|---|
| | | Drift, salmon | Other | Set and hand | Troll |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | | 16 | 14 |
| On boats and shore | 32 | 251 | 13 | 156 | 234 |
| Total | 32 | 251 | 13 | 172 | 248 |
| Vessels: | | | | | |
| Motor | | | | 7 | 7 |
| Net tonnage | | | | 52 | 52 |
| Boats: | | | | | |
| Motor | 17 | | 12 | 103 | 198 |
| Other | 4 | 166 | | 17 | |
| Apparatus: | | | | | |
| Number | 18 | 166 | 12 | 369 | 857 |
| Length, yards | 2,685 | | | | |
| Square yards | | 158,253 | 8,862 | | |
| Hooks | | | | 57,907 | 4,040 |

| Item | Dip nets | Paranzella nets | Traps | | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | | | Crab | Octopus | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 6 | | | | 24 |
| On boats and shore | 42 | | 28 | 1 | 9 | 552 |
| Total | 42 | 6 | 28 | 1 | 9 | 576 |
| Vessels: | | | | | | |
| Motor | | 2 | | | | 10 |
| Net tonnage | | 14 | | | | 73 |
| Boats: | | | | | | |
| Motor | | | 22 | 1 | | 206 |
| Other | 42 | | | | | 212 |
| Apparatus: | | | | | | |
| Number | 42 | 1 | 408 | 10 | 9 | |
| Yards at mouth | | 17 | | | | |

*Fisheries of the northern district of California, 1930*—Continued

CATCH: BY GEAR

| Species | Haul seines | | Gill nets | | Lines | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Set and hand | | Troll | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Catfish | | | | | 43,343 | $6,401 | | |
| Flounders: | | | | | | | | |
| "Sole" | | | | | 5,021 | 149 | | |
| Other | 3,962 | $180 | | | | | | |
| Halibut | | | | | 400,613 | 45,258 | 11,443 | $1,080 |
| Herring | 103,183 | 1,692 | | | | | | |
| "Lingcod" | | | | | 246,597 | 10,040 | 45,227 | 1,221 |
| Perch | 31,561 | 1,262 | 801 | $32 | | | | |
| Rockfishes | | | | | 159,395 | 5,530 | 5,583 | 115 |
| Sablefish | | | | | 618,754 | 26,180 | | |
| Salmon | 30,436 | 1,515 | 667,975 | 64,354 | | | 2,803,128 | 222,031 |
| Sculpin | | | | | 229 | 5 | | |
| Sea bass, white or squeteague | | | | | 216 | 7 | | |
| Smelt | 39,559 | 2,323 | 25,881 | 1,790 | | | | |
| Whitebait | 3,378 | 139 | 214 | 8 | | | | |
| Other fish | | | 153 | 10 | 67,867 | 1,605 | 598 | 15 |
| Total | 212,079 | 7,111 | 695,024 | 66,194 | 1,542,035 | 95,175 | 2,865,979 | 224,462 |
| SHELLFISH | | | | | | | | |
| Octopus | | | | | 953 | 75 | | |
| Grand total | 212,079 | 7,111 | 695,024 | 66,194 | 1,542,988 | 95,250 | 2,865,979 | 224,462 |

| Species | Dip nets | | Paranzella nets | | Traps | | Shovels | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Flounders: | | | | | | | | |
| "Sole" | | | 1,564,378 | $95,740 | | | | |
| Other | 42 | $2 | 78,199 | 3,307 | | | | |
| Grayfish | | | 2,345 | 23 | | | | |
| Halibut | | | 1,902 | 181 | | | | |
| "Lingcod" | | | 220,155 | 8,806 | | | | |
| Perch | 64 | 2 | | | | | | |
| Rockfishes | | | 88,590 | 2,835 | | | | |
| Sablefish | | | 8,297 | 207 | | | | |
| Skates | | | 3,030 | 61 | | | | |
| Smelt | 7,453 | 415 | | | | | | |
| Tomcod | | | 712 | 28 | | | | |
| Whitebait | 141,162 | 8,827 | | | | | | |
| Other fish | 115 | 7 | 1,610 | 40 | | | | |
| Total | 148,836 | 9,253 | 1,969,218 | 111,228 | | | | |
| SHELLFISH | | | | | | | | |
| Crabs | | | | | 92,448 | $9,638 | | |
| Clams: | | | | | | | | |
| Cockle | | | | | | | 7 | $2 |
| Mixed | | | | | | | 4,916 | 1,028 |
| Octopus | | | | | 4,188 | 335 | | |
| Total | | | | | 96,636 | 9,973 | 4,923 | 1,030 |

*Fisheries of the San Francisco district of California, 1930*

OPERATING UNITS: BY GEAR

| Item | Lampara nets, sardine | Haul seines | Gill nets | | | | | Lines | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Drift, salmon | Drift, sea bass | Drift, shad | Drift, striped bass | Other | Set and hand | Troll |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 68 | | | | | | | 133 | 2 |
| On boats and shore | 69 | 3 | 364 | 23 | 253 | 289 | 70 | 70 | 270 |
| Total | 137 | 3 | 364 | 23 | 253 | 289 | 70 | 203 | 272 |
| Vessels: | | | | | | | | | |
| Motor | 7 | | | | | | | 1 | 1 |
| Net tonnage | 76 | | | | | | | 9 | 19 |
| Sail | | | | | | | | 4 | |
| Net tonnage | | | | | | | | 1,722 | |
| Total vessels | 7 | | | | | | | 5 | 1 |
| Total net tonnage | 76 | | | | | | | 1,731 | 19 |
| Boats: | | | | | | | | | |
| Motor | 12 | | 187 | 15 | 126 | 151 | 37 | 81 | 255 |
| Other | | 1 | 10 | 2 | 7 | 9 | 2 | 10 | |
| Apparatus: | | | | | | | | | |
| Number | 19 | 1 | 197 | 17 | 133 | 160 | 64 | 619 | 936 |
| Length, yards | 4,080 | 100 | | | | | | | |
| Square yards | | | 634,088 | 38,070 | 441,226 | 434,720 | 108,177 | | |
| Hooks | | | | | | | | 55,843 | 4,780 |

| Item | Fyke nets | Bag nets | Paranzella nets | Beam trawls | Traps | Harpoons, whaling | Tongs | Rakes | Shovels | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 14 | 86 | | | 44 | | | | 345 |
| On boats and shore | 97 | 52 | | 22 | 207 | | 21 | 1 | 28 | 997 |
| Total | 97 | 66 | 86 | 22 | 207 | 44 | 21 | 1 | 28 | 1,342 |
| Vessels: | | | | | | | | | | |
| Steam | | | | | | 4 | | | | 4 |
| Net tonnage | | | | | | 153 | | | | 153 |
| Motor | | 3 | 20 | | | | | | | 30 |
| Net tonnage | | 20 | 312 | | | | | | | 408 |
| Sail | | | | | | | | | | 4 |
| Net tonnage | | | | | | | | | | 1,722 |
| Total vessels | | 3 | 20 | | | 4 | | | | 38 |
| Total net tonnage | | 20 | 312 | | | 153 | | | | 2,283 |
| Boats: | | | | | | | | | | |
| Motor | 31 | 8 | | 22 | 206 | | 7 | | | 538 |
| Other | 40 | 5 | | | | | 14 | 1 | 28 | 89 |
| Apparatus: | | | | | | | | | | |
| Number | 2,102 | 16 | 10 | 22 | 4,086 | 4 | 21 | 1 | 28 | |
| Length, yards | | 8,996 | | | | | | | | |
| Yards at mouth | | | 170 | 147 | | | | | | |

*Fisheries of the San Francisco district of California, 1930*—Continued

CATCH: BY GEAR

| Species | Lampara nets | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Anchovies | 261,850 | $3,142 | | | | |
| Carp | | | 4,835 | $232 | 43,589 | $705 |
| Flounders, other | 843 | 32 | | | 1,302 | 31 |
| Grayfish | 2,460 | 25 | | | 12,602 | 126 |
| Herring | 3,485 | 51 | | | 598,442 | 5,386 |
| Kingfish | 22,160 | 776 | | | | |
| Mackerel | 12,246 | 367 | | | 116 | 4 |
| Perch | 1,711 | 102 | | | 110,550 | 5,528 |
| Pilchard or sardine | 48,468,957 | 195,812 | | | | |
| Salmon | | | | | 1,214,084 | 109,762 |
| Sea bass, white or squeteague | 3,739 | 280 | | | 44,403 | 3,219 |
| Shad | | | | | 1,199,459 | 45,314 |
| Smelt | 4,844 | 291 | | | 193,562 | 10,646 |
| Squawfish | | | | | 1,455 | 51 |
| Striped bass | | | | | 851,417 | 88,485 |
| Suckers | | | | | 33 | 2 |
| Tomcod | 15,450 | 618 | | | 108 | 4 |
| Whitebait | 30,758 | 2,614 | | | 875 | 74 |
| Other fish | | | | | 1,616 | 49 |
| Total | 48,828,503 | 204,110 | 4,835 | 232 | 4,273,613 | 269,386 |

| Species | Lines | | | | Fyke nets | | Bag nets | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Carp | | | | | 18,588 | $378 | | |
| Catfish | | | | | 389,848 | 51,827 | | |
| Cod | 9,259,119 | $150,928 | | | | | | |
| Eels | 10 | 1 | | | | | | |
| Flounders: | | | | | | | | |
| "Sole" | 3,146 | 142 | | | | | | |
| Other | 367 | 9 | | | | | | |
| Grayfish | 6,822 | 68 | 1,700 | $12 | | | | |
| Halibut | 391 | 38 | 669 | 61 | | | | |
| Hardhead | | | | | 38,857 | 5,257 | | |
| "Lingcod" | 267,162 | 12,022 | 7,298 | 194 | | | | |
| Rockfishes | 492,075 | 17,223 | 3,020 | 61 | | | | |
| Sablefish | 118,203 | 3,842 | | | | | | |
| Salmon | | | 1,007,856 | 99,574 | | | | |
| Sea bass, white or squeteague | | | 192 | 14 | | | | |
| Splittail | | | | | 18,528 | 555 | | |
| Squawfish | | | | | 3,752 | 249 | | |
| Striped bass | 15,391 | 1,902 | | | | | | |
| Suckers | | | | | 1,957 | 98 | | |
| Other fish | 2,166 | 54 | 487 | 11 | 220 | 10 | | |
| Total | 10,164,852 | 186,229 | 1,021,222 | 99,927 | 471,750 | 58,374 | | |
| SHELLFISH, ETC. | | | | | | | | |
| Shrimp | | | | | | | 1,296,247 | $19,444 |
| Octopus | 7,527 | 677 | | | | | | |
| Grand total | 10,172,379 | 186,906 | 1,021,222 | 99,927 | 471,750 | 58,374 | 1,296,247 | 19,444 |

*Fisheries of the San Francisco district of California, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Paranzella nets | | Beam trawls | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Flounders: | | | | | | | | |
| "Sole" | 8,056,525 | $493,059 | | | | | | |
| Other | 812,938 | 33,992 | | | | | | |
| Grayfish | 198,088 | 1,981 | | | | | | |
| Hake | 50,983 | 510 | | | | | | |
| Halibut | 30,059 | 2,856 | | | | | | |
| Kingfish | 18,177 | 454 | | | | | | |
| "Lingcod" | 307,442 | 12,298 | | | | | | |
| Perch | 225 | 9 | | | | | | |
| Rockfishes | 532,401 | 17,037 | | | | | | |
| Sablefish | 343,145 | 8,579 | | | | | | |
| Skates | 221,324 | 4,426 | | | | | | |
| Tomcod | 6,902 | 276 | | | | | | |
| Other fish | 7,667 | 153 | | | | | | |
| Total | 10,585,876 | 575,630 | | | | | | |
| SHELLFISH, ETC. | | | | | | | | |
| Crabs | 2,946 | 380 | | | 1,895,886 | $229,703 | | |
| Shrimp | | | 1,391,584 | $20,874 | | | | |
| Octopus | 1,051 | 63 | | | | | | |
| Total | 3,997 | 443 | 1,391,584 | 20,874 | 1,895,886 | 229,703 | | |
| WHALE PRODUCTS | | | | | | | | |
| Whale oil | | | | | | | 3,844,209 | $166,953 |
| Grand total | 10,589,873 | 576,073 | 1,391,584 | 20,874 | 1,895,886 | 229,703 | 3,844,209 | 166,953 |

| Species | Tongs | | Rakes and shovels | | By hand | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH, ETC. | | | | | | |
| Clams: | | | | | | |
| Cockle | | | 21,534 | $7,594 | | |
| Soft | | | 37,303 | 9,474 | | |
| Mixed | | | 246 | 70 | | |
| Mussels | | | 3 | 1 | | |
| Oysters: | | | | | | |
| Eastern, market | 72,796 | $29,118 | | | | |
| Native, market | 4,949 | 3,093 | | | | |
| Terrapin | | | | | 58 | $7 |
| Total | 77,745 | 32,211 | 59,086 | 17,139 | 58 | 7 |

*Fisheries of the Monterey district of California, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines, sardine | Lampara nets | | Gill nets | | Trammel nets | Lines | |
|---|---|---|---|---|---|---|---|---|
| | | Sardine | Squid | Drift, sea bass | Other | | Set and hand | Troll |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 51 | 459 | 114 | | | | 14 | 14 |
| On boats and shore | | 312 | 184 | 31 | 71 | 13 | 238 | 204 |
| Total | 51 | 771 | 298 | 31 | 71 | 13 | 252 | 218 |
| Vessels, motor | 5 | 37 | 20 | | | | 5 | 7 |
| Net tonnage | 232 | 571 | 274 | | | | 102 | 114 |
| Boats: | | | | | | | | |
| Motor | | 25 | 32 | 23 | 42 | 8 | 182 | 197 |
| Other | | | | | 16 | | 30 | |
| Apparatus: | | | | | | | | |
| Number | 5 | 62 | 52 | 23 | 61 | 8 | 1,954 | 1,214 |
| Length, yards | 2,050 | 20,756 | 10,220 | | | | | |
| Square yards | | | | 45,322 | 83,390 | 12,480 | | |
| Hooks | | | | | | | 140,631 | 4,977 |

*Fisheries of the Monterey district of California, 1930*—Continued

OPERATING UNITS: BY GEAR—Continued

| Item | Paranzella nets | Traps, octopus | Rakes | Shovels | Abalone outfits | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | | | | | 50 | 557 |
| On boats and shore | 6 | 15 | 1 | 8 | 10 | 632 |
| Total | 6 | 15 | 1 | 8 | 60 | 1,189 |
| Vessels, motor | | | | | 10 | 52 |
| Net tonnage | | | | | 77 | 904 |
| Boats: | | | | | | |
| Motor | 2 | 11 | | | 2 | 237 |
| Other | | 1 | | | | 35 |
| Apparatus: | | | | | | |
| Number | 1 | 141 | 1 | 8 | 12 | |
| Yards at mouth | 17 | | | | | |

CATCH: BY GEAR

| Species | Purse seines | | Lampara nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Anchovies | | | 43,500 | $749 | | | | |
| Barracuda | | | | | 30 | $3 | | |
| Flounders: | | | | | | | | |
| "California halibut" | | | 237 | 28 | | | 13,946 | $1,693 |
| "Sole" | | | 140 | 7 | | | 2,338 | 117 |
| Other | | | | | | | 184 | 8 |
| Horse mackerel | | | 94,901 | 1,012 | 370 | 18 | | |
| Kingfish | | | 24,254 | 857 | 82,566 | 2,902 | | |
| "Lingcod" | | | 25 | 1 | | | 448 | 24 |
| Mackerel | | | 113,212 | 3,279 | 1,419 | 44 | | |
| Perch | | | 6,958 | 350 | 7,740 | 332 | | |
| Pilchard or sardine | 64,290,585 | $307,400 | 194,789,676 | 870,040 | 17,672 | 177 | | |
| Pompano | | | 384 | 166 | 132 | 48 | | |
| Rockfishes | | | 823 | 26 | | | 65 | 2 |
| Sculpin | | | | | | | 65 | 7 |
| Sea bass, white or squeteague | 191 | 23 | 625 | 65 | 44,819 | 2,977 | | |
| Skates | | | 1,853 | 34 | | | 4,308 | 96 |
| Smelt | | | 60,844 | 3,443 | 278,848 | 14,643 | | |
| Tuna and tunalike fishes, bonito | | | 508 | 25 | 658 | 33 | | |
| Whitebait | | | 2,996 | 261 | | | | |
| Total | 64,290,776 | 307,423 | 195,140,936 | 880,343 | 434,254 | 21,177 | 21,354 | 1,947 |
| SHELLFISH | | | | | | | | |
| Crabs | | | | | 1,088 | 160 | | |
| Squid | | | 10,937,974 | 115,614 | | | | |
| Grand total | 64,290,776 | 307,423 | 206,078,910 | 995,957 | 435,342 | 21,337 | 21,354 | 1,947 |

*Fisheries of the Monterey district of California, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Lines | | | | Paranzella nets | | Traps | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Flounders: | | | | | | | | |
| "California halibut" | 5,362 | $542 | 1,529 | $186 | 3,338 | $350 | | |
| "Sole" | 32,446 | 1,503 | 15 | 1 | 869,180 | 52,215 | | |
| Other | 7,489 | 399 | | | 97,066 | 4,070 | | |
| Grayfish | 280 | 3 | | | 8,645 | 86 | | |
| Hake | | | | | 5,105 | 51 | | |
| Kingfish | 8,257 | 289 | | | 9,530 | 238 | | |
| "Lingcod," | 154,597 | 8,416 | 3,370 | 186 | 37,914 | 1,523 | | |
| Mackerel | 1,245,875 | 39,088 | 2,600 | 78 | | | | |
| Perch | 129 | 7 | | | 130 | 5 | | |
| Rock bass | 16 | 1 | | | | | | |
| Rockfishes | 2,769,684 | 96,129 | 3,245 | 114 | 52,153 | 1,990 | | |
| Sablefish | 243,116 | 7,754 | | | 24,473 | 612 | | |
| Salmon | | | 279,409 | 31,528 | | | | |
| Sculpin | 752 | 14 | | | | | | |
| Sea bass, white or squeteague | 26 | 2 | 16 | 2 | | | | |
| Skates | 4,517 | 91 | | | 18,193 | 349 | | |
| Smelt | 271 | 19 | | | | | | |
| Tuna and tunalike fishes, albacore | | | 172,962 | 12,570 | | | | |
| Other fish | 7,838 | 357 | | | 4,893 | 171 | | |
| Total | 4,480,655 | 154,614 | 463,146 | 44,665 | 1,130,620 | 61,660 | | |
| SHELLFISH | | | | | | | | |
| Crabs | | | | | 16 | 2 | | |
| Shrimp | | | | | | | 8,736 | $1,954 |
| Octopus | 8,974 | 904 | | | 117 | 11 | 53,912 | 5,154 |
| Total | 8,974 | 904 | | | 133 | 13 | 62,648 | 7,108 |
| Grand total | 4,489,629 | 155,518 | 463,146 | 44,665 | 1,130,753 | 61,673 | 62,648 | 7,108 |

| Species | Rakes | | Shovels | | Abalone outfits | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| SHELLFISH | | | | | | |
| Abalone | | | | | 631,795 | $126,359 |
| Clams, Pismo | | | 2,409 | $1,230 | | |
| Mussels | 30 | $5 | | | | |
| Total | 30 | 5 | 2,409 | 1,230 | 631,795 | 126,359 |

*Fisheries of the San Pedro division of the southern district of California, 1930*

OPERATING UNITS: BY GEAR

| Item | Purse seines | | | Lampara nets | | Haul seines | Gill nets | | |
|---|---|---|---|---|---|---|---|---|---|
| | Barracuda | Sardine | Tuna | Sardine | Other | | Drift, barracuda | Set, sea bass | Other |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 303 | 785 | 817 | 390 | 361 | | 32 | 14 | 21 |
| On boats and shore | | | | | 50 | 2 | 74 | 69 | 41 |
| Total | 303 | 785 | 817 | 390 | 411 | 2 | 106 | 83 | 62 |
| Vessels, motor | 33 | 78 | 82 | 39 | 41 | | 11 | 4 | 7 |
| Net tonnage | 938 | 2,991 | 3,328 | 893 | 506 | | 69 | 42 | 49 |
| Boats: | | | | | | | | | |
| Motor | | | | | 11 | | 26 | 30 | 15 |
| Other | | | | | | 1 | 1 | 3 | 11 |
| Apparatus: | | | | | | | | | |
| Number | 33 | 78 | 82 | 39 | 52 | 1 | 38 | 37 | 37 |
| Length, yards | 14,228 | 31,747 | 46,625 | 17,106 | 21,152 | 100 | | | |
| Square yards | | | | | | | 330,904 | 152,625 | 30,905 |

*Fisheries of the San Pedro division of the southern district of California, 1930*—Con.

OPERATING UNITS: BY GEAR—Continued

| Item | Trammel nets | Lines | | Paranzella nets | Traps, lobster | Harpoons, swordfish | Shovels | Abalone outfits | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|
| | | Set and hand | Troll | | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 37 | 119 | 731 | 10 | 19 | 21 | | | 2,025 |
| On boats and shore | 55 | 403 | 287 | 14 | 142 | 33 | 61 | 2 | 732 |
| Total | 92 | 522 | 1,018 | 24 | 161 | 54 | 61 | 2 | 2,757 |
| Vessels, motor | 13 | 40 | 110 | 3 | 8 | 5 | | | 254 |
| Net tonnage | 85 | 425 | 3,914 | 42 | 61 | 69 | | | 7,707 |
| Boats: | | | | | | | | | |
| Motor | 21 | 288 | 209 | 5 | 79 | 17 | | 1 | 405 |
| Other | 1 | 18 | | | 13 | | | | 41 |
| Apparatus: | | | | | | | | | |
| Number | 35 | 1,450 | 2,215 | 4 | 2,805 | 22 | 61 | 1 | |
| Square yards | 255,500 | | | | | | | | |
| Yards at mouth | | | | 67 | | | | | |
| Hooks | | 255,987 | 2,215 | | | | | | |

CATCH OFF CALIFORNIA: BY GEAR

| Species | Purse seines | | Lampara nets | | Haul seines | | Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Anchovies | | | 10,311 | $284 | | | | |
| Barracuda | 712,739 | $76,627 | 607,348 | 29,831 | | | 637,740 | $47,273 |
| Carp | | | | | 2,375 | $175 | | |
| Eels | | | 10 | 1 | | | | |
| Flounders: | | | | | | | | |
| "California halibut" | 186 | 22 | 430 | 60 | | | 407 | 51 |
| "Sole" | | | | | | | 52 | 2 |
| Flyingfish | 170 | 6 | 315 | 12 | | | 47,973 | 1,787 |
| Grayfish | 3,862 | 75 | 7,264 | 195 | | | 102,013 | 3,067 |
| Halfmoon | 2,920 | 247 | 13,894 | 756 | | | 19,951 | 1,717 |
| Herring | | | | | | | 259 | 13 |
| Horse mackerel | 38,353 | 1,434 | 234,518 | 8,651 | | | 48 | 2 |
| Kingfish | | | 276,951 | 5,293 | | | 741 | 14 |
| "Lingcod" | | | | | | | 20 | 1 |
| Mackerel | 72,776 | 775 | 10,497,248 | 108,489 | | | 107,081 | 2,191 |
| Mullet | | | 1,892 | 181 | | | 9,204 | 874 |
| Perch | 3,761 | 229 | 76,915 | 1,399 | | | 22,109 | 1,735 |
| Pilchard or sardine | 121,628,006 | 647,669 | 61,083,099 | 330,096 | | | 770 | 19 |
| Pompano | | | 1,275 | 716 | | | 14 | 8 |
| Rock bass | 10,085 | 1,053 | 26,051 | 1,660 | | | 2,193 | 90 |
| Rockfishes | 90 | 6 | 613 | 18 | | | 237 | 15 |
| Sculpin | | | | | | | 29 | 3 |
| Sea bass: | | | | | | | | |
| Black | 9,915 | 527 | 5,453 | 320 | | | 4,405 | 233 |
| White or squeteague | 73,512 | 9,024 | 391,883 | 36,480 | | | 395,165 | 32,188 |
| Sheepshead | | | | | | | 1,007 | 36 |
| Smelt | 1,879 | 83 | 268,021 | 10,757 | | | 158,072 | 8,875 |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | 15,036,617 | 859,132 | 405,172 | 22,708 | | | | |
| Bonito | 2,416,196 | 78,599 | 121,256 | 2,799 | | | 56,121 | 1,089 |
| Whitebait | | | | | | | 55 | 4 |
| Whitefish | 30 | 2 | 105 | 9 | | | 253 | 14 |
| Yellowtail | 81,568 | 4,706 | 120,216 | 6,567 | | | 11,035 | 603 |
| Other fish | 87 | 4 | 940 | 61 | | | 1,006 | 22 |
| Total | 140,092,752 | 1,680,220 | 74,151,180 | 567,343 | 2,375 | 175 | 1,577,960 | 101,926 |
| SHELLFISH | | | | | | | | |
| Squid | | | 30,316 | 1,665 | | | | |
| Grand total | 140,092,752 | 1,680,220 | 74,181,496 | 569,008 | 2,375 | 175 | 1,577,960 | 101,926 |

*Fisheries of the San Pedro division of the southern district of California, 1930*—Con.

CATCH OFF CALIFORNIA: BY GEAR—Continued

| Species | Trammel nets | | Lines | | | | Paranzella nets | |
|---|---|---|---|---|---|---|---|---|
| | | | Set and hand | | Troll | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Barracuda | | | | | 597,025 | $32,418 | 23 | $2 |
| Flounders: | | | | | | | | |
| "California halibut" | 321,738 | $45,476 | 28,577 | $3,692 | | | 379,728 | 43,831 |
| "Sole" | 4,214 | 261 | 6,401 | 456 | | | 368,099 | 15,605 |
| Other | 3,413 | 259 | 13,168 | 416 | | | 760 | 53 |
| Grayfish | 60,884 | 2,203 | 98,395 | 2,664 | 3,214 | 62 | 12,535 | 437 |
| Horse mackerel | | | 638 | 25 | | | | |
| Kingfish | | | 12,051 | 241 | | | | |
| "Lingcod" | | | 2,688 | 142 | | | 700 | 35 |
| Mackerel | | | 3,543,550 | 69,847 | 252,697 | 3,544 | | |
| Perch | | | 415 | 21 | | | | |
| Pompano | | | 47 | 25 | 15 | 8 | | |
| Rock bass | 578 | 39 | 148,146 | 11,791 | 4,810 | 302 | 1,049 | 83 |
| Rockfishes | 130 | 7 | 2,040,496 | 89,031 | 28 | 2 | 1,727 | 80 |
| Sablefish | | | 5,506 | 405 | | | | |
| Salmon | | | | | 6 | 1 | | |
| Sculpin | 20 | 1 | 64,186 | 6,848 | | | 443 | 51 |
| Sea bass: | | | | | | | | |
| Black | 1,453 | 103 | 80,488 | 4,011 | 529 | 32 | 973 | 66 |
| White or squeteague | 2,251 | 322 | 21,883 | 2,039 | 364 | 33 | 1,627 | 270 |
| Sheepshead | 818 | 33 | 53,573 | 1,884 | | | 86 | 3 |
| Skates | 6,841 | 163 | 8,868 | 184 | | | 15,701 | 315 |
| Smelt | | | 3,303 | 152 | | | 134 | 7 |
| Swordfish | | | | | 28,091 | 1,687 | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | | | | | 107,987 | 10,857 | | |
| Bluefin | | | 764 | 74 | 793 | 62 | | |
| Bonito | 153 | 2 | 1,605 | 42 | 29,311 | 612 | | |
| Skipjack or striped tuna | | | | | 1,109,680 | 44,387 | | |
| Yellowfin | | | | | 12,564 | 795 | | |
| Whitefish | 197 | 14 | 112,052 | 8,449 | | | | |
| Yellowtail | 243 | 13 | 310 | 20 | 28,466 | 1,589 | | |
| Other fish | 376 | 15 | 31,403 | 2,228 | 178 | 8 | | |
| Total | 403,339 | 48,911 | 6,278,513 | 204,737 | 2,175,758 | 96,399 | 784,185 | 60,838 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | 7,045 | 1,399 | | | | | 340 | 74 |
| Squid | 60 | 7 | | | | | | |
| Total | 7,105 | 1,406 | | | | | 340 | 74 |
| Grand total | 410,444 | 50,317 | 6,278,513 | 204,737 | 2,175,758 | 96,399 | 784,525 | 60,912 |

| Species | Traps | | Harpoons | | Shovels | | Abalone outfits | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Perch | 1,231 | $60 | | | | | | |
| Rock bass | 152,724 | 9,441 | | | | | | |
| Rockfishes | 990 | 59 | | | | | | |
| Sculpin | 889 | 106 | | | | | | |
| Sheepshead | 148,109 | 5,514 | | | | | | |
| Swordfish | | | 168,334 | $24,922 | | | | |
| Whitefish | 2,662 | 142 | | | | | | |
| Total | 306,605 | 15,322 | 168,334 | 24,922 | | | | |
| SHELLFISH | | | | | | | | |
| Crabs | 12 | 3 | | | | | | |
| Sea crawfish or spiny lobster | 260,285 | 51,687 | | | | | | |
| Abalone | | | | | | | 15,521 | $3,972 |
| Clams: | | | | | | | | |
| Cockle | | | | | 8,510 | $2,063 | | |
| Pismo | | | | | 19,363 | 8,380 | | |
| Octopus | 258 | 46 | | | | | | |
| Total | 260,555 | 51,736 | | | 27,873 | 10,443 | 15,521 | 3,972 |
| Grand total | 567,160 | 67,058 | 168,334 | 24,922 | 27,873 | 10,443 | 15,521 | 3,972 |

*Fisheries of the San Pedro division of the southern district of California, 1930*—Con.

CATCH OFF LATIN AMERICA: BY GEAR

| Species | Purse seines | | Lampara nets | | Gill nets | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Barracuda | 860,009 | $91,182 | | | 187 | $28 |
| Cabrilla | 315 | 16 | | | | |
| Flounders, "California halibut" | 218 | 21 | | | | |
| Mullet | 80 | 6 | 474 | $31 | | |
| Perch | 660 | 30 | | | | |
| Rock bass | 3,262 | 240 | | | | |
| Sea bass: | | | | | | |
| Black | 44,593 | 2,398 | | | 2,953 | 173 |
| White or squeteague | 60,241 | 8,146 | | | 26,606 | 2,540 |
| Spanish mackerel | 545 | 38 | | | | |
| Tuna and tunalike fishes: | | | | | | |
| Bluefin | 6,150,000 | 338,341 | | | | |
| Bonito | 1,208,576 | 41,935 | | | | |
| Skipjack or striped tuna | 38,051 | 1,599 | | | | |
| Yellowfin | 1,184,340 | 79,496 | | | | |
| Whitefish | 200 | 13 | | | 160 | 11 |
| Yellowtail | 2,049,967 | 85,565 | | | 384 | 20 |
| Other fish | 354 | 21 | | | | |
| Total | 11,601,411 | 649,047 | 474 | 31 | 30,290 | 2,772 |

| Species | Trammel nets | | Lines | | | |
|---|---|---|---|---|---|---|
| | | | Set and hand | | Troll | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Barracuda | | | | | 77,519 | $5,164 |
| Cabrilla | | | 387,079 | $22,529 | | |
| Flounders: | | | | | | |
| "California halibut" | 11,990 | $1,160 | 354 | 53 | | |
| Other | 100 | 7 | | | | |
| Grayfish | | | 1,555 | 62 | | |
| Rock bass | | | 10,710 | 582 | | |
| Sea bass: | | | | | | |
| Black | | | 23,516 | 1,242 | 90 | 5 |
| White or squeteague | | | 41,346 | 3,740 | | |
| Sheepshead | | | 377 | 15 | | |
| Spanish mackerel | | | 19,075 | 1,246 | | |
| Tuna and tunalike fishes: | | | | | | |
| Bonito | | | | | 5,991 | 188 |
| Skipjack or striped tuna | | | | | 5,609,289 | 202,279 |
| Yellowfin | | | | | 11,353,431 | 675,038 |
| Yellowtail | | | | | 364,323 | 26,244 |
| Other fish | | | 4,520 | 215 | | |
| Total | 12,090 | 1,167 | 488,532 | 29,684 | 17,500,643 | 908,918 |

*Fisheries of the San Diego division of the southern district of California, 1930*

OPERATING UNITS: BY GEAR

| Item | Lampara nets, sardine | Gill nets | | | Trammel nets |
|---|---|---|---|---|---|
| | | Drift, barracuda | Set, sea bass | Other | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 80 | 10 | 14 | | 15 |
| On boats and shore | 17 | 39 | 46 | 15 | 37 |
| Total | 97 | 49 | 60 | 15 | 52 |
| Vessels, motor | 14 | 3 | 4 | | 4 |
| Net tonnage | 138 | 21 | 34 | | 36 |
| Boats: | | | | | |
| Motor | 3 | 16 | 18 | 8 | 14 |
| Other | | | | 1 | |
| Apparatus: | | | | | |
| Number | 17 | 10 | 22 | 11 | 18 |
| Length, yards | 4,790 | | | | |
| Square yards | | 94,804 | 120,450 | 6,826 | 247,572 |

*Fisheries of the San Diego division of the southern district of California, 1930*—Con.

OPERATING UNITS: BY GEAR—Continued

| Item | Lines | | Traps, lobster | Harpoons, swordfish and turtle | Total, exclusive of duplication |
|---|---|---|---|---|---|
| | Set and hand | Troll | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | |
| On vessels | 214 | 770 | 43 | 75 | 841 |
| On boats and shore | 125 | 114 | 52 | 19 | 210 |
| Total | 339 | 884 | 95 | 94 | 1,051 |
| Vessels, motor | 47 | 102 | 10 | 16 | 117 |
| Net tonnage | 643 | 5,129 | 108 | 196 | 5,246 |
| Boats: | | | | | |
| Motor | 79 | 72 | 37 | 8 | 119 |
| Other | | | 2 | | 3 |
| Apparatus: | | | | | |
| Number | 735 | 1,545 | 1,572 | 24 | |
| Hooks | 115,690 | 1,545 | | | |

CATCH OFF CALIFORNIA: BY GEAR

| Species | Purse seines | | Lampara nets | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Anchovies | | | 3,900 | $39 | | | | |
| Barracuda | | | | | 81,492 | $6,799 | | |
| Flounders, "California halibut" | | | | | | | 106,983 | $11,628 |
| Grayfish | | | | | 63,175 | 308 | 33,711 | 151 |
| Herring | | | | | 43,579 | 565 | | |
| Kingfish | | | 490 | 18 | | | | |
| Mackerel | | | 239,355 | 2,887 | 19,220 | 392 | 271 | 8 |
| Mullet | | | 94 | 9 | 9,563 | 849 | | |
| Perch | | | 2,934 | 82 | 443 | 16 | | |
| Pilchard or sardine | | | 4,171,982 | 26,219 | | | | |
| Pompano | | | 327 | 131 | | | | |
| Rock bass | | | | | 334 | 11 | 348 | 9 |
| Rockfishes | | | | | | | 536 | 32 |
| Sea bass: | | | | | | | | |
| Black | | | | | 2,250 | 108 | 1,557 | 88 |
| White or squeteague | | | 28 | 5 | 105,538 | 7,973 | 116 | 21 |
| Skates | | | | | | | 1,670 | 33 |
| Smelt | | | 6,127 | 271 | 7,800 | 468 | | |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | 130,448 | $7,175 | 25,067 | 1,379 | | | | |
| Bonito | | | 688 | 20 | 10,944 | 270 | | |
| Yellowtail | | | | | | | 8,954 | 420 |
| Total | 130,448 | 7,175 | 4,450,992 | 31,060 | 344,338 | 17,759 | 154,146 | 12,390 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | | | 2,194 | 295 |
| Squid | | | 679 | 34 | | | 433 | 52 |
| Total | | | 679 | 34 | | | 2,627 | 347 |
| Grand total | 130,448 | 7,175 | 4,451,671 | 31,094 | 344,338 | 17,759 | 156,773 | 12,737 |

NOTE.—The catch by purse seines was made entirely by fishermen from the San Pedro section.

*Fisheries of the San Diego division of the southern district of California, 1930*—Con.

CATCH OFF CALIFORNIA: BY GEAR—Continued

| Species | Lines | | | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | | | |
| Barracuda | | | 877,211 | $56,308 | | | | |
| Cabrilla | 471 | $17 | | | | | | |
| Flounders: | | | | | | | | |
| "California halibut" | 2,482 | 201 | | | | | | |
| "Sole" | 6,498 | 583 | | | | | | |
| Other | 43 | 3 | | | | | | |
| Grayfish | 27,747 | 123 | | | | | | |
| Kingfish | 1,981 | 61 | | | | | | |
| Mackerel | 404,154 | 10,322 | 18,280 | 231 | | | | |
| Pompano | 29 | 11 | | | | | | |
| Rock bass | 117,321 | 5,016 | 126 | 6 | 11,891 | $602 | | |
| Rockfishes | 1,052,930 | 50,407 | | | 138 | 6 | | |
| Sculpin | 23,043 | 1,982 | | | | | | |
| Sea bass: | | | | | | | | |
| Black | 80,345 | 3,490 | 75 | 4 | | | | |
| White or squeteague | 152,464 | 10,795 | 227 | 24 | | | | |
| Sheepshead | 15,962 | 572 | | | 21,499 | 882 | | |
| Skates | 85 | 1 | | | | | | |
| Swordfish | | | 175 | 9 | | | 364,895 | $48,723 |
| Tuna and tunalike fishes: | | | | | | | | |
| Albacore | | | 2,168 | 224 | | | | |
| Bluefin | | | 31 | 2 | | | | |
| Bonito | 40 | 1 | 1,229,016 | 38,072 | | | | |
| Skipjack or striped tuna | | | 1,905,595 | 76,224 | | | | |
| Yellowfin | | | 22,989 | 1,379 | | | | |
| Whitefish | 99,267 | 3,836 | | | | | | |
| Yellowtail | 59 | 3 | 964,108 | 38,646 | | | | |
| Total | 1,984,921 | 87,424 | 5,020,001 | 211,129 | 33,528 | 1,490 | 364,895 | 48,723 |
| SHELLFISH | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | 104,586 | 20,779 | | |
| Grand total | 1,984,921 | 87,424 | 5,020,001 | 211,129 | 138,114 | 22,269 | 364,895 | 48,723 |

CATCH OFF LATIN AMERICA: BY GEAR

| Species | Purse seines | | Gill nets | | Trammel nets | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| FISH | | | | | | |
| Barracuda | 44,761 | $6,732 | 18,539 | $1,531 | | |
| Flounders, "California halibut" | | | | | 189,094 | $19,930 |
| Sea bass: | | | | | | |
| Black | 1,109 | 59 | 23,887 | 1,214 | 23,433 | 1,218 |
| White or squeteague | 2,935 | 229 | 235,115 | 21,332 | 287 | 38 |
| Smelt | | | 1,082 | 79 | | |
| Tuna and tunalike fishes: | | | | | | |
| Bluefin | 172,296 | 9,139 | | | | |
| Bonito | 28,511 | 1,049 | | | | |
| Yellowfin | 361,494 | 22,369 | | | | |
| Yellowtail | 53,560 | 2,054 | 15,083 | 730 | | |
| Total | 664,666 | 41,631 | 293,706 | 24,886 | 212,814 | 21,186 |
| SHELLFISH, ETC. | | | | | | |
| Sea crawfish or spiny lobster | | | | | 132 | 24 |
| Grand total | 664,666 | 41,631 | 293,706 | 24,886 | 212,946 | 21,210 |

NOTE.—The catch by purse seines was made entirely by fishermen from the San Pedro section.

*Fisheries of the San Diego division of the southern district of California, 1930*—Con.

CATCH OFF LATIN AMERICA: BY GEAR—Continued

| Species | Lines | | | | Traps | | Harpoons | |
|---|---|---|---|---|---|---|---|---|
| | Set and hand | | Troll | | | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Barracuda | | | 249,143 | $25,224 | | | | |
| Cabrilla | 121,674 | $4,528 | | | | | | |
| Flounders, "California halibut" | 42 | 6 | | | | | | |
| Mackerel | 719 | 13 | 545 | 10 | | | | |
| Rock bass | 17,804 | 1,474 | 715 | 17 | | | | |
| Rockfishes | 8,405 | 429 | | | | | | |
| Sea bass: | | | | | | | | |
| Black | 86,448 | 4,562 | 507 | 25 | | | | |
| White or squeteague | 20,461 | 2,625 | 146 | 19 | | | | |
| Sheepshead | 2,258 | 96 | | | | | | |
| Spanish mackerel | 23,345 | 757 | | | | | | |
| Swordfish | | | | | | | 1,234 | $154 |
| Tuna and tunalike fishes: | | | | | | | | |
| Bluefin | 94 | 5 | | | | | | |
| Bonito | | | 54,686 | 1,830 | | | | |
| Skipjack or striped tuna | | | 11,732,972 | 465,347 | | | | |
| Yellowfin | | | 43,719,363 | 2,617,140 | | | | |
| Whitefish | 10,176 | 470 | | | | | | |
| Yellowtail | 678 | 61 | 1,071,474 | 42,535 | | | | |
| Total | 292,104 | 15,026 | 56,829,551 | 3,152,147 | | | 1,234 | 154 |
| SHELLFISH, ETC. | | | | | | | | |
| Sea crawfish or spiny lobster | | | | | 1,019,557 | $188,887 | | |
| Turtles | | | | | | | 580 | 58 |
| Grand total | 292,104 | 15,026 | 56,829,551 | 3,152,147 | 1,019,557 | 188,887 | 1,814 | 212 |

*Industries related to the fisheries of California, 1930*

TRANSPORTING

| | |
|---|---|
| Persons engaged on vessels | 41 |
| Vessels: | |
| Steam | 1 |
| Net tonnage | 33 |
| Motor | 7 |
| Net tonnage | 539 |
| Total vessels | 8 |
| Total net tonnage | 572 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Northern district | San Francisco district | Monterey district | Southern district | | Total |
|---|---|---|---|---|---|---|
| | | | | San Pedro division | San Diego division | |
| Establishments | 8 | 35 | 32 | 55 | 21 | 151 |
| Persons engaged: | | | | | | |
| Proprietors | 5 | 47 | 41 | 93 | 27 | 213 |
| Salaried employees | 10 | 154 | 155 | 252 | 59 | 630 |
| Wage earners— | | | | | | |
| Average for season | 119 | 685 | 2,201 | 3,163 | 1,518 | 7,686 |
| Average for year | 38 | 564 | 865 | 1,561 | 629 | 3,639 |
| Paid to salaried employees | $21,173 | $412,130 | $398,786 | $692,955 | $172,846 | $1,697,890 |
| Paid to wage earners | 40,199 | 859,041 | 880,068 | 1,789,121 | 779,796 | 4,348,225 |
| Total, salaries and wages | 61,372 | 1,271,171 | 1,278,854 | 2,482,076 | 952,642 | 6,046,115 |

*Industries related to the fisheries of California*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Barracuda, fresh fillets | pounds | 225,000 | $43,500 |
| Cabrilla, fresh fillets | do | 115,000 | 20,250 |
| Cod: | | | |
| Salted [1] | do | 2,870,327 | 150,928 |
| Salted, packaged | do | 2,149,827 | [2] 323,836 |
| Flounders, fresh fillets | do | 4,735,000 | 947,000 |
| Halibut, fresh fillets | do | 45,000 | 15,750 |
| Mackerel, canned | standard cases | 127,479 | 430,962 |
| Pilchard or sardine: | | | |
| Salted | pounds | 65,490 | 3,472 |
| Canned | standard cases | 2,979,333 | 8,741,928 |
| Meal | tons | 25,938 | 1,414,858 |
| Oil | gallons | 5,803,166 | 1,826,319 |
| Rockfishes, fresh fillets | pounds | 761,500 | 120,400 |
| Salmon, mild-cured | do | 1,039,500 | 189,000 |
| Sea bass, black, fresh fillets | do | 55,500 | 7,825 |
| Sea bass, white, fresh fillets | do | 326,250 | 79,375 |
| Totuava, fresh fillets | do | 260,000 | 52,000 |
| Tuna and tunalike fishes: | | | |
| Salted (bonito) | do | 18,124 | 1,567 |
| Canned [3] | standard cases | 2,010,640 | 13,055,876 |
| Meal | tons | 8,554 | 428,556 |
| Oil | gallons | 56,748 | 14,153 |
| Spiny lobsters (fresh-cooked, whole) | pounds | 1,064,250 | 287,693 |
| Shrimp: | | | |
| Sun-dried | do | 146,842 | 28,507 |
| Meal | tons | 136 | 6,800 |
| Squid, dried | pounds | 1,383,660 | 55,346 |
| Abalone, fresh steaks | do | 583,589 | 248,025 |
| Marine-shell novelties | | (4) | 95,000 |
| Unclassified products: | | | |
| Packaged [5] | | (4) | 72,500 |
| Salted [6] | pounds | 526,029 | 41,142 |
| Smoked [7] | do | 450,098 | 124,131 |
| Canned [8] | standard cases | 24,484 | 198,783 |
| Meal [9] | tons | 3,712 | 237,672 |
| Oil [10] | gallons | 579,083 | 187,720 |
| By-products [11] | | (4) | 269,202 |
| Total | | | 29,720,076 |

[1] The cod were salted in Alaskan waters.
[2] This figure is included in the total, however, it should be explained that it represents a further manufacture of salted cod already included in this table.
[3] Includes canned albacore; bluefin, striped, and yellowfin tuna; bonito; and yellowtail.
[4] Data not available.
[5] Includes packaged fried fish cakes; and fresh-shucked western and eastern oysters.
[6] Includes salted anchovies, barracuda, cabrilla, herring, mackerel, mullet, salmon, black and white sea bass, Spanish mackerel, whitefish, and yellowtail; and mild-cured shad.
[7] Includes smoked mackerel, sablefish, salmon, and sardines.
[8] Includes canned salmon, shad, shad roe, abalone, squid, and fish cakes.
[9] Includes kelp, mackerel, and miscellaneous fish meal and fish flour.
[10] Includes sperm, whale, shark, shark-liver, mackerel, and miscellaneous fish oils.
[11] Includes agar agar; glue; miscellaneous dry scrap; alginates; and oyster-shell products.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State.

## HALIBUT FISHERY OF THE PACIFIC COAST [11]

The halibut fishery of the Pacific coast, which is prosecuted both by United States (including Alaska) and Canadian vessels, ranks as one of the foremost fisheries of that section. During 1931 the total catch by

[11] To preclude the possibility of unwarranted comparison of figures given in this section with others for years previous to 1927, it should be explained that the figures as herein compiled differ from those published in separate reports for the Alaska fisheries and the Pacific Coast States. The difference lies principally in the fleet classifications as between Washington and Alaska, though there is reason to believe that the figures on landings also are not comparable with those previously published, due to variable practice in the inclusion of United States caught halibut landed at foreign ports as well as the possible duplication of figures. The present compilation is a complete résumé of the landings of the United States fleet for the year 1931 at all Pacific ports, except those in Oregon and California, without omission or duplication. The fleet classification has been applied arbitrarily by including in the "Washington fleet" all vessels that land more than half of their catch in that State. All others were included in the "Alaska fleet." It has been necessary to use "hailing fares" for the weight of the landings at Prince Rupert, British Columbia. The data for Seattle and Alaska are based on the actual weight of the fares. Halibut are landed with the heads on, but eviscerated.

vessels of both nationalities amounted to 42,845,000 pounds, valued at $2,842,000. This is a decrease of 13 per cent in quantity and 43 per cent in value as compared with the catch in 1930. Of the total catch in 1930, 83 per cent was taken by United States craft and 17 per cent by Canadian craft. Considered according to the ports of landing, 42 per cent was landed at Canadian ports, 36 per cent at ports in the State of Washington, and 22 per cent at ports in Alaska.

*Halibut fishery of the Pacific coast, 1931*

UNITED STATES OPERATING UNITS: BY FLEET CLASSIFICATION

| Item | Washington fleet | Alaska fleet | Total |
|---|---|---|---|
| Regular halibut vessels: | | | |
| Number | 94 | 123 | 217 |
| Net tonnage | 2,448 | 2,663 | 5,111 |
| Crew | 651 | 768 | 1,419 |
| Dories | 94 | 123 | 217 |
| Skates of lines | 2,812 | 3,532 | 6,344 |
| Vessels in other fisheries but landing one or more fares of halibut: | | | |
| Number | 28 | 46 | 74 |
| Net tonnage | 593 | 508 | 1,101 |
| Crew | 150 | 167 | 317 |
| Dories | 18 | 33 | 51 |
| Skates of lines | 769 | 995 | 1,764 |
| Regular halibut boats: | | | |
| Number | | 17 | 17 |
| Crew | | 47 | 47 |
| Skates of lines | | 306 | 306 |
| Boats in other fisheries but landing one or more fares of halibut: | | | |
| Number | | 95 | 95 |
| Crew | | 150 | 150 |
| Skates of lines | | 636 | 636 |

CATCH OF ALL SPECIES: BY UNITED STATES VESSELS AND BOATS

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Washington | | British Columbia | | Alaska | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| WASHINGTON FLEET | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 11,402,473 | $827,509 | 1,823,417 | $116,981 | 884,414 | $51,724 | 14,110,304 | $996,214 |
| Sablefish | 1,255,446 | 43,245 | | | 1,145 | 35 | 1,256,591 | 43,280 |
| "Lingcod" | 301,399 | 8,452 | | | | | 301,399 | 8,452 |
| Rockfishes | 254,823 | 6,367 | | | | | 254,823 | 6,367 |
| Total | 13,214,141 | 885,573 | 1,823,417 | 116,981 | 885,559 | 51,759 | 15,923,117 | 1,054,313 |
| Other vessels: | | | | | | | | |
| Halibut | 823,482 | 70,903 | 31,441 | 2,605 | 12,657 | 1,131 | 867,580 | 74,639 |
| Sablefish | 17,269 | 725 | | | | | 17,269 | 725 |
| "Lingcod" | 89,007 | 2,475 | | | | | 89,007 | 2,475 |
| Rockfishes | 23,869 | 763 | | | | | 23,869 | 763 |
| Total | 953,627 | 74,866 | 31,441 | 2,605 | 12,657 | 1,131 | 997,725 | 78,602 |
| ALASKA FLEET | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 2,962,330 | 206,007 | 8,413,476 | 567,533 | 6,773,367 | 410,620 | 18,149,173 | 1,184,160 |
| Sablefish | 22,318 | 980 | | | 257,416 | 7,455 | 279,734 | 8,435 |
| "Lingcod" | 15,285 | 1,111 | | | | | 15,285 | 1,111 |
| Rockfishes | 9,106 | 639 | | | 1,522 | 57 | 10,628 | 696 |
| Total | 3,009,039 | 208,737 | 8,413,476 | 567,533 | 7,032,305 | 418,132 | 18,454,820 | 1,194,402 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 25,606 | 2,847 | 295,174 | 20,675 | 1,955,680 | 145,005 | 2,276,460 | 168,527 |
| Sablefish | 3,680 | 184 | | | 7,915 | 234 | 11,595 | 418 |
| "Lingcod" | 838 | 42 | | | 1,249 | 33 | 2,087 | 75 |
| Rockfishes | 1,293 | 65 | | | 8,412 | 198 | 9,705 | 263 |
| Total | 31,417 | 3,138 | 295,174 | 20,675 | 1,973,256 | 145,470 | 2,299,847 | 169,283 |

*Halibut fishery of the Pacific coast, 1931*—Continued

CATCH OF ALL SPECIES: BY UNITED STATES VESSELS AND BOATS—Continued

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Washington | | British Columbia | | Alaska | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| COMBINED FLEETS | | | | | | | | |
| Regular vessels: | | | | | | | | |
| Halibut | 14, 364, 803 | $1,033,516 | 10, 236, 893 | $684, 514 | 7, 657, 781 | $462, 344 | 32, 259, 477 | $2,180,374 |
| Sablefish | 1, 277, 764 | 44, 225 | | | 258, 561 | 7, 490 | 1, 536, 325 | 51, 715 |
| "Lingcod" | 316, 684 | 9, 563 | | | | | 316, 684 | 9, 563 |
| Rockfishes | 263, 929 | 7, 006 | | | 1, 522 | 57 | 265, 451 | 7, 063 |
| Total | 16, 223, 180 | 1, 094, 310 | 10, 236, 893 | 684, 514 | 7, 917, 864 | 469, 891 | 34, 377, 937 | 2, 248, 715 |
| Other vessels and boats: | | | | | | | | |
| Halibut | 849, 088 | 73, 750 | 326, 615 | 23, 280 | 1, 968, 337 | 146, 136 | 3, 144, 040 | 243, 166 |
| Sablefish | 20, 949 | 909 | | | 7, 915 | 234 | 28, 864 | 1, 143 |
| "Lingcod" | 89, 845 | 2, 517 | | | 1, 249 | 33 | 91, 094 | 2, 550 |
| Rockfishes | 25, 162 | 828 | | | 8, 412 | 198 | 33, 574 | 1, 026 |
| Total | 985, 044 | 78, 004 | 326, 615 | 23, 280 | 1, 985, 913 | 146, 601 | 3, 297, 572 | 247, 885 |
| All vessels and boats: | | | | | | | | |
| Halibut | 15, 213, 891 | 1, 107, 266 | 10, 563, 508 | 707, 794 | 9, 626, 118 | 608, 480 | 35, 403, 517 | 2, 423, 540 |
| Sablefish | 1, 298, 713 | 45, 134 | | | 266, 476 | 7, 724 | 1, 565, 189 | 52, 858 |
| "Lingcod" | 406, 529 | 12, 080 | | | 1, 249 | 33 | 407, 778 | 12, 113 |
| Rockfishes | 289, 091 | 7, 834 | | | 9, 934 | 255 | 299, 025 | 8, 089 |
| Grand total | 17, 208, 224 | 1, 172, 314 | 10, 563, 508 | 707, 794 | 9, 903, 777 | 616, 492 | 37, 675, 509 | 2, 496, 600 |

NOTE.—These statistics are compiled from data collected by the International Fisheries Commission for Washington, by the U. S. Consular Service and the Prince Rupert Halibut Exchange for British Columbia, and by bureau agents for Alaska.

CATCH OF HALIBUT: BY UNITED STATES AND CANADIAN VESSELS AND BOATS

[Expressed in thousands of pounds and thousands of dollars; that is, 000 omitted]

| Fleet classification | Landed in— | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Washington | | British Columbia | | Alaska | | | |
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| WASHINGTON FLEET | | | | | | | | |
| Regular halibut vessels | 11, 403 | $827 | 1, 823 | $117 | 884 | $52 | 14, 110 | $996 |
| Other vessels | 823 | 71 | 32 | 3 | 13 | 1 | 868 | 75 |
| Total | 12, 226 | 898 | 1, 855 | 120 | 897 | 53 | 14, 978 | 1, 071 |
| ALASKA FLEET | | | | | | | | |
| Regular halibut vessels | 2, 962 | 206 | 8, 413 | 568 | 6, 774 | 410 | 18, 149 | 1, 184 |
| Other vessels and boats | 26 | 3 | 295 | 20 | 1, 955 | 145 | 2, 276 | 168 |
| Total | 2, 988 | 209 | 8, 708 | 588 | 8, 729 | 555 | 20, 425 | 1, 352 |
| COMBINED FLEETS | | | | | | | | |
| Regular halibut vessels | 14, 365 | 1, 033 | 10, 236 | 685 | 7, 658 | 462 | 32, 259 | 2, 180 |
| Other vessels and boats | 849 | 74 | 327 | 23 | 1, 968 | 146 | 3, 144 | 243 |
| Total | 15, 214 | 1, 107 | 10, 563 | 708 | 9, 626 | 608 | 35, 403 | 2, 423 |
| British Columbia fleet | 13 | 1 | 7, 429 | [1] 418 | | | 7, 442 | 419 |
| Grand total | 15, 227 | 1, 108 | 17, 992 | 1, 126 | 9, 626 | 608 | 42, 845 | 2, 842 |

[1] Estimated.

NOTE.—These statistics are compiled from data collected by the International Fisheries Commission for Washington, by the U. S. Consular Service and the Prince Rupert Halibut Exchange for British Columbia, and by bureau agents for Alaska.

## VESSEL FISHERIES AT SEATTLE, WASH.

During 1931, a total of 40,746,241 pounds of fishery products, valued at $2,308,024, were handled by Seattle wholesale dealers, exclusive of quantities received by transporting vessels or rail from Alaska or Canada. This represents an increase of 5 per cent in quantity and a decrease of 33 per cent in value as compared with the previous year.

Of the total quantity handled, 17,208,224 pounds, valued at $1,172,314, were landed by fishing vessels, an increase of 4 per cent in quantity and a decrease of 31 per cent in value as compared with the previous year. The vessels made 1,064 trips to the fishing grounds during the year, which is 170 trips less than during 1930. Halibut was the most important species taken by the fishing vessels, accounting for 88 per cent of the catch. Sablefish accounted for 8 per cent; and "lingcod" and rockfishes, each 2 per cent.

The catch by fishing vessels was taken off the Pacific coast from Oregon to Unalaska Island. South of Cape Spencer ranked as the most productive area, furnishing 56 per cent of the catch. Grounds west of Cape Spencer provided the balance.

During 1931, 23,538,017 pounds, valued at $1,135,710, were received by wholesale dealers from sources other than Alaska or Canada, or from vessels in the halibut fishery. Most of these products were taken in Puget Sound. This is an increase of 6 per cent in the quantity received from similar sources in 1930 and a decrease of 35 per cent in value. The increase in quantity was due to the large catch of humpback or pink salmon as compared with the "off year" for this species in 1930. All varieties of salmon accounted for 91 per cent of the fishery products handled by the wholesale dealers from sources other than the halibut fleet or from Alaska or Canada.

*Fishery products landed by United States vessels at Seattle, Wash., 1931* [1]

BY BANKS

| Fishing ground | Trips | Halibut | | | | Sablefish | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | | No. 2 | | | |
| | | Pounds | Value | Pounds | Value | Pounds | Value |
| | *Number* | | | | | | |
| West of Cape Spencer | 268 | 4,037,226 | $351,278 | 3,403,699 | $171,878 | 18,304 | $761 |
| South of Cape Spencer | 796 | 3,239,218 | 327,953 | 4,533,748 | 256,157 | 1,280,409 | 44,373 |
| Total | 1,064 | 7,276,444 | 679,231 | 7,937,447 | 428,035 | 1,298,713 | 45,134 |

| Fishing ground | "Lingcod" | | Rockfishes | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| West of Cape Spencer | 30,473 | $1,515 | 5,153 | $213 | 7,494,819 | $525,645 |
| South of Cape Spencer | 376,092 | 10,565 | 283,938 | 7,621 | 9,713,405 | 646,669 |
| Total | 406,529 | 12,080 | 289,091 | 7,834 | 17,208,224 | 1,172,314 |

[1] Halibut fleet.

*Fishery products landed by United States vessels at Seattle, Wash., 1931* [1]—Cont'd

BY MONTHS

| Month | Trips | Halibut | | | | Sablefish | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | | No. 2 | | | |
| | | Pounds | Value | Pounds | Value | Pounds | Value |
| | *Number* | | | | | | |
| January | 7 | | | | | | |
| February | 7 | 16,367 | $2,067 | 3,203 | $249 | 2,000 | $180 |
| March | 67 | 496,298 | 61,549 | 230,526 | 21,481 | 15,403 | 770 |
| April | 113 | 750,892 | 81,339 | 547,779 | 42,433 | 12,886 | 543 |
| May | 135 | 671,357 | 64,207 | 919,432 | 55,997 | 8,779 | 370 |
| June | 155 | 908,779 | 88,249 | 1,227,896 | 59,762 | 65,500 | 2,796 |
| July | 123 | 1,070,574 | 89,631 | 1,128,656 | 49,304 | 143,477 | 4,123 |
| August | 144 | 1,337,109 | 96,822 | 1,340,616 | 52,139 | 207,156 | 5,705 |
| September | 138 | 1,024,353 | 81,311 | 1,260,298 | 56,470 | 310,558 | 10,127 |
| October | 106 | 653,760 | 67,842 | 912,450 | 59,927 | 316,736 | 11,119 |
| November | 57 | 346,955 | 46,214 | 366,591 | 30,273 | 180,718 | 7,685 |
| December | 12 | | | | | 35,500 | 1,716 |
| Total | 1,004 | 7,276,444 | 679,231 | 7,937,447 | 428,035 | 1,298,713 | 45,134 |

| Month | "Lingcod" | | Rockfishes | | Total | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| January | 26,600 | $1,603 | 10,500 | $779 | 37,100 | $2,382 |
| February | 17,150 | 1,355 | 8,950 | 726 | 47,670 | 4,577 |
| March | 31,255 | 1,556 | 4,347 | 230 | 777,829 | 85,586 |
| April | 104,250 | 2,425 | 33,186 | 804 | 1,448,993 | 127,544 |
| May | 58,527 | 1,137 | 28,672 | 642 | 1,686,767 | 122,353 |
| June | 35,691 | 718 | 43,264 | 943 | 2,281,130 | 152,468 |
| July | 10,499 | 209 | 17,819 | 365 | 2,371,025 | 143,632 |
| August | 15,251 | 302 | 53,642 | 1,071 | 2,953,774 | 156,039 |
| September | 15,446 | 343 | 39,555 | 928 | 2,650,210 | 149,179 |
| October | 28,479 | 685 | 29,300 | 733 | 1,940,725 | 140,306 |
| November | 19,681 | 742 | 356 | 13 | 914,301 | 84,927 |
| December | 43,700 | 1,005 | 19,500 | 600 | 98,700 | 3,321 |
| Total | 406,529 | 12,080 | 289,091 | 7,834 | 17,208,224 | 1,172,314 |

[1] Halibut fleet.

*Fishery products received by Seattle wholesale dealers, 1931* [1]

BY MONTHS

| Species | January | | February | | March | | April | | May | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Flounders: | | | | | | | | | | |
| "Sole" | 39,765 | $1,388 | 43,221 | $1,673 | 42,983 | $1,242 | 49,022 | $1,822 | 29,592 | $805 |
| Other | | | 100 | 3 | 2,988 | 87 | 3,125 | 94 | 1,073 | 11 |
| Halibut | | | | | 3,020 | 453 | 3,060 | 248 | 7,547 | 609 |
| Herring | 875 | 18 | 2,217 | 34 | 1,050 | 10 | 750 | 4 | | |
| "Lingcod" | 8,847 | 398 | 12,219 | 623 | 9,466 | 259 | 22,241 | 636 | 6,666 | 134 |
| Perch | 3,040 | 137 | 3,180 | 160 | 7,034 | 274 | 5,541 | 166 | 5,352 | 160 |
| Rockfishes | 5,625 | 208 | 7,561 | 350 | 5,183 | 244 | 5,832 | 169 | 7,639 | 198 |
| Salmon: | | | | | | | | | | |
| Blueback, red or sockeye | | | | | | | | | 329 | 23 |
| Chinook or king | 96 | 19 | 299 | 57 | 23,892 | 3,931 | 281,610 | 37,477 | 1,452,151 | 122,379 |
| Chum or keta | 3,584 | 179 | | | | | | | 442 | 12 |
| Silver or coho | 68 | 5 | | | | | | | 21,661 | 1,102 |
| Smelt | 15,159 | 858 | 23,457 | 556 | 27,766 | 808 | 654 | 54 | 12,424 | 996 |
| Steelhead trout | 24,652 | 3,105 | 21,007 | 2,868 | 759 | 91 | | | 14,436 | 1,414 |
| Sturgeon | | | | | | | | | 699 | 35 |
| Crabs | 62,706 | 3,926 | 69,573 | 4,787 | 76,666 | 4,816 | 75,056 | 4,978 | 50,439 | 6,185 |
| Octopus | 535 | 28 | 2,863 | 143 | 7,348 | 221 | 7,375 | 221 | 7,362 | 219 |
| Total | 164,952 | 10,269 | 185,697 | 11,254 | 208,155 | 12,436 | 454,266 | 45,869 | 1,617,812 | 134,282 |

[1] This tabulation does not include fish received from Alaska or Canada, or vessels in the halibut fleet.

*Fishery products received by Seattle wholesale dealers, 1931*—Continued

BY MONTHS—Continued

| Species | June | | July | | August | | September | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Flounders: | | | | | | | | |
| "Sole" | 25,439 | $598 | 31,932 | $801 | 15,278 | $413 | 26,580 | $742 |
| Other | 4,752 | 68 | 754 | 8 | 2,497 | 35 | 526 | 5 |
| Halibut | 6,274 | 521 | 6,510 | 370 | 14,719 | 281 | 1,393 | 119 |
| Herring | | | 80 | 1 | | | | |
| "Lingcod" | 6,447 | 128 | 9,257 | 180 | 11,027 | 198 | 3,088 | 215 |
| Perch | 2,190 | 109 | 2,035 | 81 | 2,067 | 82 | 2,882 | 86 |
| Rockfishes | 15,519 | 477 | 8,371 | 230 | 4,482 | 140 | 3,100 | 77 |
| Sablefish | 34 | 1 | | | | | | |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | 4,127 | 288 | 13,656 | 1,205 | 26,640 | 2,443 | 1,134 | 105 |
| Chinook or king | 2,233,946 | 210,262 | 2,664,507 | 127,301 | 1,693,110 | 142,251 | 400,087 | 28,818 |
| Chum or keta | 2,460 | 62 | 11,945 | 179 | 80,630 | 1,209 | 167,948 | 2,516 |
| Humpback or pink | 4,790 | 107 | 521,095 | 8,106 | 3,388,001 | 44,893 | 768,422 | 8,504 |
| Silver or coho | 532,070 | 29,275 | 578,830 | 29,296 | 467,407 | 24,276 | 1,739,851 | 78,359 |
| Smelt | 13,117 | 656 | 29,177 | 1,114 | 12,862 | 590 | 49,379 | 1,802 |
| Steelhead trout | 16,114 | 804 | 14,947 | 1,195 | 1,626 | 130 | 20,496 | 888 |
| Sturgeon | 459 | 22 | 305 | 17 | 1,842 | 97 | 327 | 16 |
| Crabs | 66,616 | 4,509 | 54,648 | 4,346 | 48,818 | 3,328 | 28,842 | 1,967 |
| Octopus | 4,181 | 124 | 2,785 | 84 | 1,154 | 56 | 4,961 | 242 |
| Total | 2,938,535 | 248,011 | 3,950,834 | 174,514 | 5,772,160 | 220,422 | 3,219,016 | 124,461 |

| Species | October | | November | | December | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Flounders: | | | | | | | | |
| "Sole" | 22,000 | $588 | 27,987 | $669 | 35,368 | $940 | 389,167 | $11,681 |
| Other | 7,810 | 78 | 199 | 2 | 3,080 | 31 | 26,904 | 422 |
| Halibut | 1,414 | 170 | | | | | 43,937 | 2,771 |
| Herring | 4,715 | 94 | 2,212 | 44 | | | 11,899 | 205 |
| "Lingcod" | 3,204 | 78 | 16,469 | 492 | 42,224 | 1,611 | 151,155 | 4,952 |
| Perch | 6,134 | 202 | 7,699 | 323 | 6,953 | 235 | 54,107 | 2,015 |
| Rockfishes | 4,499 | 73 | 4,445 | 194 | 13,069 | 496 | 85,325 | 2,856 |
| Sablefish | 36,186 | 1,186 | | | 540 | 11 | 36,760 | 1,198 |
| Salmon: | | | | | | | | |
| Blueback, red or sockeye | | | | | | | 45,886 | 4,064 |
| Chinook or king | 141,143 | 9,929 | 8,721 | 687 | 409 | 29 | 8,899,971 | 683,140 |
| Chum or keta | 2,335,295 | 35,029 | 617,555 | 13,623 | 14,160 | 212 | 3,234,019 | 53,021 |
| Humpback or pink | 1,145 | 14 | | | | | 4,683,453 | 61,624 |
| Silver or coho | 937,544 | 43,926 | 129,467 | 9,017 | 44,751 | 5,350 | 4,451,649 | 220,606 |
| Smelt | 45,710 | 1,868 | 22,559 | 1,241 | 16,731 | 1,198 | 268,995 | 11,741 |
| Steelhead trout | 2,482 | 198 | 8,087 | 647 | 11,838 | 1,411 | 136,444 | 12,751 |
| Sturgeon | 236 | 12 | | | 180 | 18 | 4,047 | 217 |
| Crabs | 174,310 | 8,680 | 144,128 | 7,530 | 96,142 | 5,101 | [2] 947,944 | 60,153 |
| Octopus | 9,572 | 287 | 7,769 | 255 | 10,450 | 413 | 66,355 | 2,293 |
| Total | 3,733,398 | 102,412 | 997,297 | 34,724 | 295,895 | 17,056 | 23,538,017 | 1,135,710 |

[2] 43,769 dozen.

## LAKE FISHERIES [12]

The yield of the fisheries of the Great Lakes including the international lakes of northern Minnesota during 1930 amounted to 94,947,642 pounds, valued at $6,050,267. This is an increase of 11 per cent in quantity, but a decrease of 11 per cent in value as compared with the catch and its value for 1929. These fisheries gave

[12] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure" which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

The statistics of the catch presented herewith were obtained largely from the records of the various State fishery agencies and from the Dominion Bureau of Statistics, Ottawa, Canada. The data for the operating units (fishermen, vessels, boats, and gear) of the United States were obtained largely by bureau agents in a special canvass; although State records in several instances were very helpful in this work.

In all cases the statistics collected are for the calendar year, except for Lake of the Woods, Rainy Lake, and Lake Namakan in Minnesota, which are for two seasons. For Lake of the Woods the seasons are from June 1 to Nov. 1 and Dec. 1 to Apr. 1, and for Rainy and Namakan Lakes from May 15 to Nov. 1 and Dec. 1 to Apr. 1. The catch for these two seasons, in the order named, have been combined to constitute a year. The quantity of fish taken in these lakes between Jan. 1 and Apr. 1 amounted to less than 3 per cent of the total catch of these lakes in 1927.

employment to 6,980 fishermen or 3 per cent less than in 1929. Of the total number of fishermen employed, 1,666 regular fishermen were engaged on vessels, and 3,703 regular and 1,617 casual fishermen were employed in the shore and boat fisheries.

*Lake fisheries of the United States and Canada, 1930*

CATCH: BY LAKES

| Species | Lake Ontario | | | Lake Erie | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Blue pike | 30,753 | 25,000 | 55,753 | 11,792,338 | 5,899,100 | 17,691,438 |
| Bowfin | 817 | (1) | 817 | 2,576 | (1) | 2,576 |
| Burbot | 95,612 | (1) | 95,612 | 405,442 | (1) | 405,442 |
| Carp | 26,204 | 57,600 | 83,804 | 1,861,184 | 277,800 | 2,138,984 |
| Catfish and bullheads | 80,246 | 145,000 | 225,246 | 322,631 | 102,700 | 425,331 |
| Chubs | | | | 12,800 | (1) | 12,800 |
| Cisco | | | | 347,356 | 506,600 | 853,956 |
| Eels | 5,100 | 99,100 | 104,200 | | 100 | 100 |
| Goldfish | | | | 63,929 | (1) | 63,929 |
| Lake herring | 189,100 | 2,319,900 | 2,509,000 | | | |
| Lake trout | 24,082 | 363,700 | 387,782 | 5,083 | 11,100 | 16,183 |
| Minnows | 109 | (1) | 109 | | | |
| Mooneye | | | | 36,488 | (1) | 36,488 |
| Pike (jacks) | 8,625 | 133,100 | 141,725 | 8,183 | 41,600 | 49,783 |
| Rock bass | 705 | (1) | 705 | 2,208 | (1) | 2,208 |
| Sauger pike | | | | 1,530,770 | (1) | 1,530,770 |
| Sheepshead | | | | 2,883,581 | (1) | 2,883,581 |
| Sturgeon | 24,483 | 3,400 | 27,883 | 16,162 | 27,000 | 43,162 |
| Sucker "mullet" | 50,617 | (1) | 50,617 | 2,015,786 | (1) | 2,015,786 |
| Sunfish | 12,440 | (1) | 12,440 | | | |
| White bass | 78 | (1) | 78 | 483,696 | (1) | 483,696 |
| Whitefish: | | | | | | |
| Common | 87,400 | 551,900 | 639,300 | 1,522,012 | 1,087,700 | 2,609,712 |
| Menominee | | | | 91 | (1) | 91 |
| Yellow perch | 29,943 | 135,100 | 165,043 | 4,340,117 | 3,419,700 | 7,759,817 |
| Yellow pike | 15,583 | 23,700 | 39,283 | 1,887,708 | 274,600 | 2,162,308 |
| Miscellaneous | | 243,400 | 243,400 | | 1,032,100 | 1,032,100 |
| Total | 681,897 | 4,100,900 | 4,782,797 | 29,540,141 | 12,680,100 | 42,220,241 |

| Species | Lake Huron | | | Lake Michigan | Lake Superior | | |
|---|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | United States | Canada | Total |
| | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Blue pike | | | | | | 700 | 700 |
| Bowfin | 16,007 | (1) | 16,007 | | | | |
| Buffalofish | | | | 400 | | | |
| Burbot | 6,879 | (1) | 6,879 | 115,236 | 3,399 | (1) | 3,399 |
| Carp | 897,014 | 4,900 | 901,914 | 491,237 | 999 | 100 | 1,099 |
| Catfish and bullheads | 134,978 | 300 | 135,278 | 77,968 | 1,109 | (1) | 1,109 |
| Chubs | 506,420 | 573,300 | 1,079,720 | 5,017,391 | 526,557 | 1,100 | 527,657 |
| Lake herring | 4,748,345 | 328,400 | 5,076,745 | 6,272,752 | 11,271,303 | 2,743,500 | 14,014,803 |
| Lake trout | 1,786,529 | 1,266,300 | 3,052,829 | 5,258,024 | 2,422,998 | 1,530,200 | 3,953,198 |
| Pike (jacks) | 67,250 | 2,100 | 69,350 | 86,446 | 12,800 | 9,900 | 22,700 |
| Rock bass | 13,200 | (1) | 13,200 | 788 | | | |
| Sauger pike | 198,254 | (1) | 198,254 | 23,938 | 4,064 | (1) | 4,064 |
| Sheepshead | 5,859 | (1) | 5,859 | 18,855 | 709 | (1) | 709 |
| Smelt | | | | 430 | | | |
| Sturgeon | | 8,100 | 8,100 | | | 2,700 | 2,700 |
| Sucker "mullet" | 2,676,949 | (1) | 2,676,949 | 1,770,917 | 86,291 | (1) | 86,291 |
| Whitefish: | | | | | | | |
| Common | 3,379,776 | 246,600 | 3,626,376 | 4,788,574 | 294,679 | 371,700 | 666,379 |
| Menominee | 109,236 | (1) | 109,236 | 221,477 | 41,331 | (1) | 41,331 |
| Yellow perch | 714,949 | 30,600 | 745,549 | 1,429,700 | 5,219 | 100 | 5,319 |
| Yellow pike | 1,114,999 | 153,200 | 1,268,199 | 63,376 | 22,885 | 66,600 | 89,485 |
| Crawfish | | | | 51,273 | | | |
| Mussel shells | | | | 5,284,475 | | | |
| Miscellaneous | | 396,200 | 396,200 | | | 34,100 | 34,100 |
| Total | 16,376,644 | 3,010,000 | 19,386,644 | 30,973,257 | 14,694,343 | 4,760,700 | 19,455,043 |

*Lake fisheries of the United States and Canada, 1930*—Continued

CATCH: BY LAKES—Continued

| Species | Namakan Lake | | | Rainy Lake | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Chubs | 57,103 | (1) | 57,103 | 41,118 | (1) | 41,118 |
| Crappie | 2,968 | (1) | 2,968 | | | |
| Pike (jacks) | 42,786 | 1,659 | 44,445 | 70,686 | 157,687 | 228,373 |
| Sturgeon | 254 | 1,445 | 1,699 | 885 | 626 | 1,511 |
| Sucker "mullet" | 19,229 | (1) | 19,229 | 1,182 | (1) | 1,182 |
| Tullibees | 2,000 | 1,695 | 3,695 | | 113,163 | 113,163 |
| Whitefish, common | 31,352 | 10,596 | 41,948 | 57,402 | 32,645 | 90,047 |
| Yellow perch | 401 | (1) | 401 | 3,059 | 9,630 | 12,689 |
| Yellow pike | 53,029 | 16,658 | 69,687 | 76,030 | 144,804 | 220,834 |
| Miscellaneous | | | | | 3,929 | 3,929 |
| Total | 209,122 | 32,053 | 241,175 | 250,362 | 462,484 | 712,846 |

| Species | Lake of the Woods | | | Total all lakes | | |
|---|---|---|---|---|---|---|
| | United States | Canada | Total | United States | Canada | Total |
| | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Blue pike | | | | 11,823,091 | 5,924,800 | 17,747,891 |
| Bowfin | | | | 19,400 | (1) | 19,400 |
| Buffalofish | 707 | (1) | 707 | 1,107 | (1) | 1,107 |
| Burbot | 15,573 | (1) | 15,573 | 642,141 | (1) | 642,141 |
| Carp | 16,469 | 3,134 | 19,603 | 3,293,107 | 343,534 | 3,636,641 |
| Catfish and bullheads | 23,956 | 61,183 | 85,139 | 640,888 | 309,183 | 950,071 |
| Chubs | | | | 6,161,389 | 574,400 | 6,735,789 |
| Cisco | | | | 347,356 | 506,600 | 853,956 |
| Crappie | 593 | (1) | 593 | 3,561 | (1) | 3,561 |
| Eels | | | | 5,100 | 99,200 | 104,300 |
| Goldeye | 55 | (1) | 55 | 55 | (1) | 55 |
| Goldfish | | | | 63,929 | (1) | 63,929 |
| Lake herring | | | | 22,481,500 | 5,391,800 | 27,873,300 |
| Lake trout | 310 | 23,473 | 23,783 | 9,497,026 | 3,194,773 | 12,691,799 |
| Minnows | | | | 109 | (1) | 109 |
| Mooneye | | | | 36,488 | (1) | 36,488 |
| Pike (jacks) | 227,628 | 406,870 | 634,498 | 524,404 | 752,916 | 1,277,320 |
| Rock bass | | | | 16,901 | (1) | 16,901 |
| Sauger pike | 73,602 | (1) | 73,602 | 1,830,628 | (1) | 1,830,628 |
| Sheepshead | | | | 2,909,004 | (1) | 2,909,004 |
| Smelt | | | | 430 | (1) | 430 |
| Sturgeon | 884 | 456 | 1,340 | 42,668 | 43,727 | 86,395 |
| Sucker "mullet" | 125,102 | (1) | 125,102 | 6,746,073 | (1) | 6,746,073 |
| Sunfish | | | | 12,440 | (1) | 12,440 |
| Tullibees | 903,023 | 102,110 | 1,005,133 | 905,023 | 216,968 | 1,121,991 |
| White bass | | | | 483,774 | (1) | 483,774 |
| Whitefish: | | | | | | |
| Common | 11,028 | 259,187 | 270,215 | 10,172,223 | 2,560,328 | 12,732,551 |
| Menominee | | | | 372,135 | (1) | 372,135 |
| Yellow perch | 54,721 | 2,190 | 56,911 | 6,578,109 | 3,597,320 | 10,175,429 |
| Yellow pike | 768,225 | 541,900 | 1,310,125 | 4,001,835 | 1,221,462 | 5,223,297 |
| Crawfish | | | | 51,273 | | 51,273 |
| Mussel shells | | | | 5,284,475 | | 5,284,475 |
| Miscellaneous | | 138,013 | 138,013 | | 1,847,742 | 1,847,742 |
| Total | 2,221,876 | 1,538,516 | 3,760,392 | 94,947,642 | 26,584,753 | 121,532,395 |

[1] Where there has been a Canadian catch of these species it is included under "Miscellaneous."

*Lake fisheries of the United States, 1930*

OPERATING UNITS: BY LAKES

| Item | Lake Ontario | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 3 | 326 | 226 | 931 | 174 | | 1,660 |
| On boats and shore— | | | | | | | |
| Regular | 81 | 915 | 766 | 903 | 959 | 79 | 3,703 |
| Casual | 93 | 266 | 126 | 987 | 145 | | 1,617 |
| Total | 177 | 1,507 | 1,118 | 2,821 | 1,278 | 79 | 6,980 |
| Vessels: | | | | | | | |
| Steam | | 29 | 17 | 53 | 8 | | 107 |
| Net tonnage | | 747 | 365 | 1,092 | 170 | | 2,374 |
| Motor | 1 | 30 | 43 | 254 | 32 | | 360 |
| Net tonnage | 11 | 292 | 457 | 2,681 | 285 | | 3,726 |
| Total vessels | 1 | 59 | 60 | 307 | 40 | | 467 |
| Total net tonnage | 11 | 1,039 | 822 | 3,773 | 455 | | 6,100 |
| Boats: | | | | | | | |
| Motor | 67 | 279 | 362 | 793 | 500 | 154 | 2,215 |
| Other | 84 | 416 | 118 | 650 | 396 | | 1,664 |
| Apparatus: | | | | | | | |
| Haul seines | | 157 | 63 | 16 | 7 | | 243 |
| Length, yards | | 83,839 | 29,689 | 5,173 | 1,740 | | 120,441 |
| Gill nets— | | | | | | | |
| "Bull," 3 to 3½ inches | | 1,158 | | | | | 1,158 |
| Square yards | | 339,778 | | | | | 339,778 |
| "Shoal," 2¼ to 3¾ inches | 774 | 10,836 | 2,306 | 14,706 | 7,201 | | 35,823 |
| Square yards | 114,349 | 1,724,562 | 843,001 | 3,347,593 | 2,467,171 | | 8,496,676 |
| "Shoal," 4 to 6 inches | 965 | 5,438 | 6,867 | 35,291 | 7,773 | 227 | 56,561 |
| Square yards | 193,500 | 1,135,496 | 2,545,679 | 10,489,683 | 3,885,655 | 78,963 | 18,328,976 |
| Trammel nets | | 94 | | | | | 94 |
| Square yards | | 9,882 | | | | | 9,882 |
| Lines— | | | | | | | |
| Hand | | 50 | 5 | 4 | 20 | | 79 |
| Hooks | | 100 | 6 | 4 | 20 | | 130 |
| Troll | | | 3 | 13 | 16 | | 32 |
| Hooks | | | 14 | 21 | 32 | | 67 |
| Trot | 50 | 181 | 144 | 242 | 614 | | 1,231 |
| Hooks | 48,500 | 34,633 | 136,700 | 345,000 | 263,541 | | 828,374 |
| Pound nets | | 86 | 716 | 668 | 105 | 77 | 1,652 |
| Trap nets | 187 | 3,940 | 1,979 | 147 | 42 | | 6,295 |
| Fyke nets | 154 | 1,183 | 378 | 507 | 25 | 268 | 2,515 |
| Dip nets | | 23 | | 4 | | | 27 |
| Crawfish pots | | | | 5,418 | | | 5,418 |
| Crowfoot bars (pairs) | | | | 285 | | | 285 |
| Tongs | | | | 12 | | | 12 |
| Forks | | | | 136 | | | 136 |
| Picks | | | | 656 | | | 656 |

OPERATING UNITS: BY STATES AND LAKES

| Item | New York | | | Pennsylvania, Lake Erie | Ohio, Lake Erie |
|---|---|---|---|---|---|
| | Lake Ontario | Lake Erie | Total | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 3 | 85 | 88 | 118 | 123 |
| On boats and shore— | | | | | |
| Regular | 81 | 18 | 99 | 34 | 709 |
| Casual | 93 | 76 | 169 | | 180 |
| Total | 177 | 179 | 356 | 152 | 1,012 |
| Vessels: | | | | | |
| Steam | | 5 | 5 | 13 | 11 |
| Net tonnage | | 101 | 101 | 329 | 317 |
| Motor | 1 | 11 | 12 | 8 | 11 |
| Net tonnage | 11 | 84 | 95 | 90 | 118 |
| Total vessels | 1 | 16 | 17 | 21 | 22 |
| Total net tonnage | 11 | 185 | 196 | 419 | 435 |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS: By States and lakes—Continued

| Item | New York | | | Pennsylvania, Lake Erie | Ohio, Lake Erie |
|---|---|---|---|---|---|
| | Lake Ontario | Lake Erie | Total | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Boats: | | | | | |
| Motor | 67 | 18 | 85 | 12 | 210 |
| Other | 84 | 48 | 132 | 14 | 300 |
| Apparatus: | | | | | |
| Haul seines | | 16 | 16 | | 106 |
| Length, yards | | 1,550 | 1,550 | | 68,452 |
| Gill nets— | | | | | |
| "Bull," 3 to 3½ inches | | 598 | 598 | 560 | |
| Square yards | | 137,088 | 137,088 | 202,690 | |
| "Shoal," 2¼ to 3¾ inches | 774 | 1,938 | 2,712 | 4,344 | 4,554 |
| Square yards | 114,349 | 280,215 | 394,564 | 736,320 | 708,027 |
| "Shoal," 4 to 6 inches | 965 | 1,961 | 2,926 | 3,198 | 279 |
| Square yards | 193,500 | 325,407 | 518,907 | 756,448 | 53,641 |
| Trammel nets | | | | | 94 |
| Square yards | | | | | 9,882 |
| Lines— | | | | | |
| Hand | | | | | 50 |
| Hooks | | | | | 100 |
| Trot | 50 | 58 | 108 | | 123 |
| Hooks | 48,500 | 9,960 | 58,460 | | 24,673 |
| Pound nets | | | | 57 | 25 |
| Trap nets | 187 | 22 | 209 | 40 | 3,842 |
| Fyke nets | 154 | | 154 | | 548 |
| Dip nets | | | | | 23 |

| Item | Michigan | | | | | Indiana, Lake Michigan |
|---|---|---|---|---|---|---|
| | Lake Erie | Lake Huron | Lake Michigan | Lake Superior | Total | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | | 226 | 442 | 95 | 763 | 17 |
| On boats and shore— | | | | | | |
| Regular | 154 | 766 | 481 | 259 | 1,660 | 16 |
| Casual | 10 | 126 | 793 | 60 | 989 | 62 |
| Total | 164 | 1,118 | 1,716 | 414 | 3,412 | 95 |
| Vessels: | | | | | | |
| Steam | | 17 | 28 | 8 | 53 | 1 |
| Net tonnage | | 365 | 492 | 170 | 1,027 | 26 |
| Motor | | 43 | 115 | 18 | 176 | 5 |
| Net tonnage | | 457 | 1,100 | 121 | 1,678 | 76 |
| Total vessels | | 60 | 143 | 26 | 229 | 6 |
| Total net tonnage | | 822 | 1,592 | 291 | 2,705 | 102 |
| Boats: | | | | | | |
| Motor | 39 | 362 | 571 | 174 | 1,146 | 40 |
| Other | 54 | 118 | 509 | 73 | 754 | 31 |
| Apparatus: | | | | | | |
| Haul seines | 35 | 63 | 1 | 7 | 106 | |
| Length, yards | 13,837 | 29,689 | 333 | 1,740 | 45,599 | |
| Gill nets— | | | | | | |
| "Shoal," 2¼ to 3¾ inches | | 2,306 | 5,519 | 2,335 | 10,160 | 387 |
| Square yards | | 843,001 | 1,238,387 | 730,911 | 2,812,299 | 99,817 |
| "Shoal," 4 to 6 inches | | 6,867 | 22,842 | 4,213 | 33,922 | 536 |
| Square yards | | 2,545,679 | 6,299,030 | 2,029,280 | 10,873,989 | 150,294 |
| Lines— | | | | | | |
| Hand | | 5 | 4 | 20 | 29 | |
| Hooks | | 6 | 4 | 20 | 30 | |
| Troll | | 3 | 13 | 16 | 32 | |
| Hooks | | 14 | 21 | 32 | 67 | |
| Trot | | 144 | 75 | 333 | 552 | |
| Hooks | | 136,700 | 117,600 | 159,041 | 413,341 | |
| Pound nets | 4 | 716 | 482 | 59 | 1,261 | 7 |
| Trap nets | 36 | 1,979 | 147 | 42 | 2,204 | |
| Fyke nets | 635 | 378 | 51 | 8 | 1,072 | |
| Dip nets | | | 4 | | 4 | |
| Crowfoot bars (pairs) | | | 237 | | 237 | 30 |
| Tongs | | | 12 | | 12 | |
| Forks | | | 123 | | 123 | |
| Picks | | | 596 | | 596 | 60 |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS: BY STATES AND LAKES—Continued

| Item | Illinois, Lake Michigan | Wisconsin | | | Minnesota | | |
|---|---|---|---|---|---|---|---|
| | | Lake Michigan | Lake Superior | Total | Lake Superior | Lake of the Woods, Rainy Lake, and Namakan Lake | Total |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | 38 | 434 | 77 | 511 | 2 | | 2 |
| On boats and shore— | | | | | | | |
| Regular | 26 | 380 | 172 | 552 | 528 | 79 | 607 |
| Casual | | 132 | 35 | 167 | 50 | | 50 |
| Total | 64 | 946 | 284 | 1,230 | 580 | 79 | 659 |
| Vessels: | | | | | | | |
| Steam | 2 | 22 | | 22 | | | |
| Net tonnage | 29 | 545 | | 545 | | | |
| Motor | 8 | 126 | 13 | 139 | 1 | | 1 |
| Net tonnage | 133 | 1,372 | 154 | 1,526 | 10 | | 10 |
| Total vessels | 10 | 148 | 13 | 161 | 1 | | 1 |
| Total net tonnage | 162 | 1,917 | 154 | 2,071 | 10 | | 10 |
| Boats: | | | | | | | |
| Motor | 18 | 164 | 92 | 256 | 294 | 154 | 448 |
| Other | | 110 | 40 | 150 | 283 | | 283 |
| Apparatus: | | | | | | | |
| Haul seines | | 15 | | 15 | | | |
| Length, yards | | 4,840 | | 4,840 | | | |
| Gill nets— | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 1,193 | 7,607 | 1,238 | 8,845 | 3,628 | | 3,628 |
| Square yards | 260,405 | 1,748,984 | 581,495 | 2,330,479 | 1,154,765 | | 1,154,765 |
| "Shoal," 4 to 6 inches | 1,190 | 10,723 | 2,080 | 12,803 | 1,480 | 227 | 1,707 |
| Square yards | 376,775 | 3,663,584 | 1,269,540 | 4,933,124 | 586,835 | 78,963 | 665,798 |
| Lines— | | | | | | | |
| Trot | | 167 | 47 | 214 | 234 | | 234 |
| Hooks | | 227,400 | 43,745 | 271,145 | 60,755 | | 60,755 |
| Pound nets | 1 | 178 | 46 | 224 | | 77 | 77 |
| Fyke nets | | 456 | 17 | 473 | | 268 | 268 |
| Crawfish pots | | 5,418 | | 5,418 | | | |
| Crowfoot bars (pairs) | | 18 | | 18 | | | |
| Forks | | 13 | | 13 | | | |

OPERATING UNITS OF LAKE ONTARIO:[1] BY GEAR

| Item | Gill nets | | Lines, trot | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|
| | "Shoal," 2¼ to 3¾ inches | "Shoal," 4 to 6 inches | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | |
| On vessels | 3 | | | | | 1 |
| On boats and shore— | | | | | | |
| Regular | 22 | 16 | | 47 | 20 | 81 |
| Casual | 49 | 18 | 30 | | | 93 |
| Total | 74 | 34 | 30 | 47 | 20 | 177 |
| Vessels, motor: | | | | | | |
| 11 to 20 tons | 1 | | | | | 1 |
| Net tonnage | 11 | | | | | 11 |
| Boats: | | | | | | |
| Motor | 31 | 13 | | 26 | 16 | 67 |
| Other | 17 | 10 | 29 | 26 | 16 | 84 |
| Apparatus: | | | | | | |
| Number | 774 | 965 | 50 | 187 | 154 | |
| Square yards | 114,349 | 163,500 | | | | |
| Hooks | | | 48,500 | | | |

[1] Includes Niagara River below the Falls and the St. Lawrence River.

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS OF LAKE ERIE:[2] BY GEAR

| Item | Haul seines | Gill nets | | | Trammel nets |
|---|---|---|---|---|---|
| | | "Bull," 3 to 3½ inches | "Shoal," 2¼ to 3¾ inches | "Shoal," 4 to 6 inches | |
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | |
| On vessels | | 130 | 315 | 226 | |
| On boats and shore— | | | | | |
| Regular | 312 | | 28 | 6 | |
| Casual | 62 | | 21 | 8 | 14 |
| Total | 374 | 130 | 364 | 240 | 14 |
| Vessels: | | | | | |
| Steam— | | | | | |
| 11 to 20 tons | | 2 | 8 | 5 | |
| 21 to 30 tons | | 8 | 13 | 11 | |
| 31 to 40 tons | | | 4 | 3 | |
| 41 to 50 tons | | | 2 | | |
| 61 to 70 tons | | | 1 | 1 | |
| Total | | 10 | 28 | 20 | |
| Net tonnage | | 222 | 715 | 499 | |
| Motor— | | | | | |
| 5 to 10 tons | | 12 | 19 | 17 | |
| 11 to 20 tons | | 1 | 9 | 3 | |
| 21 to 30 tons | | 1 | 1 | 1 | |
| Total | | 14 | 29 | 21 | |
| Net tonnage | | 131 | 283 | 195 | |
| Total vessels | | 24 | 57 | 41 | |
| Total net tonnage | | 353 | 998 | 694 | |
| Boats: | | | | | |
| Motor | 60 | | 20 | 4 | 7 |
| Other | 149 | | 12 | 4 | |
| Apparatus: | | | | | |
| Number | 157 | 1,158 | 10,836 | 5,438 | 94 |
| Length, yards | 83,839 | | | | |
| Square yards | | 339,778 | 1,724,562 | 1,135,496 | 9,882 |

| Item | Lines | | Pound nets | Trap nets | Fyke nets | Dip nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|
| | Hand | Trot | | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | |
| On vessels | | | | | | | 326 |
| On boats and shore— | | | | | | | |
| Regular | 8 | | 36 | 487 | 141 | | 915 |
| Casual | 50 | 125 | | 1 | 2 | 23 | 266 |
| Total | 58 | 125 | 36 | 488 | 143 | 23 | 1,507 |
| Vessels: | | | | | | | |
| Steam— | | | | | | | |
| 11 to 20 tons | | | | | | | 8 |
| 21 to 30 tons | | | | | | | 13 |
| 31 to 40 tons | | | | | | | 5 |
| 41 to 50 tons | | | | | | | 2 |
| 61 to 70 tons | | | | | | | 1 |
| Total | | | | | | | 29 |
| Net tonnage | | | | | | | 747 |
| Motor— | | | | | | | |
| 5 to 10 tons | | | | | | | 20 |
| 11 to 20 tons | | | | | | | 9 |
| 21 to 30 tons | | | | | | | 1 |
| Total | | | | | | | 30 |
| Net tonnage | | | | | | | 292 |
| Total vessels | | | | | | | 59 |
| Total net tonnage | | | | | | | 1,039 |
| Boats: | | | | | | | |
| Motor | 2 | | 13 | 166 | 40 | | 279 |
| Other | 2 | 125 | 17 | 139 | 59 | | 416 |
| Apparatus: | | | | | | | |
| Number | 50 | 181 | 86 | 3,940 | 1,183 | 23 | |
| Hooks | 100 | 34,633 | | | | | |

[2] Includes Niagara River above the Falls.

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS OF LAKE HURON: BY GEAR

| Item | Haul seines | Gill nets | | Lines | | | Pound nets | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | "Shoal," 2¼ to 3¾ inches | "Shoal," 4 to 6 inches | Hand | Troll | Trot | | | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | 98 | 156 | | | 62 | 24 | 42 | | 226 |
| On boats and shore— | | | | | | | | | | |
| Regular | 73 | 84 | 172 | | | 15 | 264 | 339 | 49 | 766 |
| Casual | 67 | 40 | 38 | 5 | 3 | 2 | | 5 | 2 | 126 |
| Total | 140 | 222 | 366 | 5 | 3 | 79 | 288 | 386 | 51 | 1,118 |
| Vessels: | | | | | | | | | | |
| Steam— | | | | | | | | | | |
| 5 to 10 tons | | 1 | 4 | | | 1 | 2 | | | 5 |
| 11 to 20 tons | | 1 | 5 | | | 2 | | | | 5 |
| 21 to 30 tons | | 3 | 3 | | | 2 | | | | 3 |
| 31 to 40 tons | | 2 | 2 | | | 1 | | | | 2 |
| 51 to 60 tons | | 2 | 2 | | | 1 | | | | 2 |
| Total | | 9 | 16 | | | 7 | 2 | | | 17 |
| Net tonnage | | 279 | 354 | | | 174 | 11 | | | 365 |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | | 7 | 13 | | | 1 | 4 | 12 | | 28 |
| 11 to 20 tons | | 2 | 5 | | | 1 | 1 | 3 | | 11 |
| 21 to 30 tons | | 2 | 3 | | | 1 | 1 | | | 3 |
| 31 to 40 tons | | 1 | 1 | | | 1 | | | | 1 |
| Total | | 12 | 22 | | | 4 | 6 | 15 | | 43 |
| Net tonnage | | 173 | 265 | | | 95 | 60 | 126 | | 457 |
| Total vessels | | 21 | 38 | | | 11 | 8 | 15 | | 60 |
| Total net tonnage | | 452 | 619 | | | 269 | 71 | 126 | | 822 |
| Boats: | | | | | | | | | | |
| Motor | 45 | 50 | 96 | | 1 | 8 | 104 | 143 | 25 | 362 |
| Other | 33 | 28 | 18 | 2 | 2 | 1 | 7 | 42 | 5 | 118 |
| Apparatus: | | | | | | | | | | |
| Number | 63 | 2,306 | 6,867 | 5 | 3 | 144 | 716 | 1,979 | 378 | |
| Length, yards | 29,689 | | | | | | | | | |
| Square yards | | 843,001 | 2,545,679 | | | | | | | |
| Hooks | | | | 6 | 14 | 136,700 | | | | |

OPERATING UNITS OF LAKE MICHIGAN:[1] BY GEAR

| Item | Haul seines | Gill nets | | Lines | | | Pound nets | Trap nets |
|---|---|---|---|---|---|---|---|---|
| | | "Shoal," 2¼ to 3¾ inches | "Shoal," 4 to 6 inches | Hand | Troll | Trot | | |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 10 | 509 | 819 | | | 206 | 109 | 14 |
| On boats and shore— | | | | | | | | |
| Regular | 26 | 372 | 590 | 4 | 6 | 32 | 241 | 30 |
| Casual | 8 | 74 | 48 | | 7 | 2 | 2 | |
| Total | 44 | 955 | 1,457 | 4 | 13 | 240 | 352 | 44 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 5 to 10 tons | | 1 | 5 | | | 3 | | |
| 11 to 20 tons | | 18 | 27 | | | 5 | 1 | |
| 21 to 30 tons | | 5 | 6 | | | 5 | | |
| 31 to 40 tons | | 5 | 6 | | | 6 | | |
| 41 to 50 tons | | 1 | 1 | | | 1 | | |
| 51 to 60 tons | | | | | | 1 | | |
| Total | | 30 | 45 | | | 21 | 1 | |
| Net tonnage | | 622 | 839 | | | 527 | 15 | |

[1] Includes operating units used in the mussel fisheries of streams tributary to Lakes Erie, Huron, and Michigan. Those used in Lakes Erie and Huron were inconsiderable and are included herein to avoid disclosure of private enterprise.

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS OF LAKE MICHIGAN: BY GEAR—Continued

| Item | Haul seines | Gill nets | | Lines | | | Pound nets | Trap nets |
|---|---|---|---|---|---|---|---|---|
| | | "Shoal," 2¼ to 3¾ inches | "Shoal," 4 to 6 inches | Hand | Troll | Trot | | |
| Vessels—Continued | | | | | | | | |
| Motor— | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| 5 to 10 tons | 3 | 78 | 149 | | | 22 | 33 | 5 |
| 11 to 20 tons | 1 | 40 | 61 | | | 15 | 6 | 1 |
| 21 to 30 tons | | 9 | 9 | | | 3 | | |
| 31 to 40 tons | | 4 | 3 | | | | 1 | |
| Total | 4 | 131 | 222 | | | 40 | 40 | 6 |
| Net tonnage | 29 | 1,456 | 2,247 | | | 453 | 317 | 47 |
| Total vessels | 4 | 161 | 267 | | | 61 | 41 | 6 |
| Total net tonnage | 29 | 2,078 | 3,086 | | | 980 | 332 | 47 |
| Boats: | | | | | | | | |
| Motor | 3 | 185 | 251 | 1 | 12 | 18 | 152 | 23 |
| Other | 3 | 83 | 122 | 1 | 1 | | 10 | 3 |
| Apparatus: | | | | | | | | |
| Number | 16 | 14,706 | 35,291 | 4 | 13 | 242 | 668 | 147 |
| Length, yards | 5,173 | | | | | | | |
| Square yards | | 3,317,593 | 10,489,683 | | | | | |
| Hooks | | | | 4 | 21 | 345,000 | | |

| Item | Fyke nets | Dip nets | Crawfish pots | Crowfoot bars | Tongs | Forks | Picks | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 44 | | 2 | | | | | 931 |
| On boats and shore— | | | | | | | | |
| Regular | 76 | | 30 | 9 | | 9 | | 903 |
| Casual | 30 | 4 | 10 | 285 | 12 | 141 | 676 | 987 |
| Total | 150 | 4 | 42 | 294 | 12 | 150 | 676 | 2,821 |
| Vessels: | | | | | | | | |
| Steam— | | | | | | | | |
| 5 to 10 tons | | | | | | | | 7 |
| 11 to 20 tons | | | | | | | | 26 |
| 21 to 30 tons | | | | | | | | 9 |
| 31 to 40 tons | | | | | | | | 8 |
| 41 to 50 tons | | | | | | | | 2 |
| 51 to 60 tons | | | | | | | | 1 |
| Total | | | | | | | | 53 |
| Net tonnage | | | | | | | | 1,092 |
| Motor— | | | | | | | | |
| 5 to 10 tons | 15 | | 1 | | | | | 160 |
| 11 to 20 tons | 5 | | | | | | | 76 |
| 21 to 30 tons | | | | | | | | 13 |
| 31 to 40 tons | | | | | | | | 5 |
| Total | 20 | | 1 | | | | | 254 |
| Net tonnage | 171 | | 7 | | | | | 2,681 |
| Total vessels | 20 | | 1 | | | | | 307 |
| Total net tonnage | 171 | | 7 | | | | | 3,773 |
| Boats: | | | | | | | | |
| Motor | 37 | | 16 | 284 | | 47 | 257 | 793 |
| Other | 25 | 2 | 23 | 10 | 12 | 103 | 419 | 650 |
| Apparatus: | | | | | | | | |
| Number | 507 | 4 | 5,418 | 285 | 12 | 136 | 656 | |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS OF LAKE SUPERIOR: BY GEAR

| Item | Haul seines | Gill nets | | Lines | | | Pound nets | Trap nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|---|---|---|---|---|---|
| | | "Shoal" 2¼ to 3¾ inches | "Shoal" 4 to 6 inches | Hand | Troll | Trot | | | | |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | | |
| On vessels | ------ | 117 | 107 | ------ | ------ | 73 | 6 | ------ | ------ | 174 |
| On boats and shore— | | | | | | | | | | |
| Regular | 6 | 785 | 454 | ------ | 16 | 250 | 39 | 4 | 11 | 959 |
| Casual | 1 | 107 | 51 | 20 | ------ | 7 | 8 | ------ | ------ | 145 |
| Total | 7 | 1,009 | 612 | 20 | 16 | 330 | 53 | 4 | 11 | 1,278 |
| Vessels: | | | | | | | | | | |
| Steam— | | | | | | | | | | |
| 5 to 10 tons | ------ | 1 | 1 | ------ | ------ | 1 | ------ | ------ | ------ | 1 |
| 11 to 20 tons | ------ | 2 | 1 | ------ | ------ | 2 | ------ | ------ | ------ | 3 |
| 21 to 30 tons | ------ | 2 | 3 | ------ | ------ | 1 | ------ | ------ | ------ | 3 |
| 41 to 50 tons | ------ | 1 | 1 | ------ | ------ | 1 | ------ | ------ | ------ | 1 |
| Total | ------ | 6 | 6 | ------ | ------ | 5 | ------ | ------ | ------ | 8 |
| Net tonnage | ------ | 132 | 136 | ------ | ------ | 105 | ------ | ------ | ------ | 170 |
| Motor— | | | | | | | | | | |
| 5 to 10 tons | ------ | 17 | 23 | ------ | ------ | 12 | 3 | ------ | ------ | 27 |
| 11 to 20 tons | ------ | 1 | 2 | ------ | ------ | 2 | ------ | ------ | ------ | 3 |
| 21 to 30 tons | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 |
| 31 to 40 tons | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 |
| Total | ------ | 20 | 25 | ------ | ------ | 14 | 3 | ------ | ------ | 32 |
| Net tonnage | ------ | 193 | 187 | ------ | ------ | 101 | 16 | ------ | ------ | 285 |
| Total vessels | ------ | 26 | 31 | ------ | ------ | 19 | 3 | ------ | ------ | 40 |
| Total net tonnage | ------ | 325 | 323 | ------ | ------ | 206 | 16 | ------ | ------ | 455 |
| Boats: | | | | | | | | | | |
| Motor | 3 | 462 | 331 | ------ | 8 | 208 | 23 | 2 | 10 | 560 |
| Other | 5 | 352 | 79 | 20 | ------ | 8 | 9 | ------ | ------ | 396 |
| Apparatus: | | | | | | | | | | |
| Number | 7 | 7,201 | 7,773 | 20 | 16 | 614 | 105 | 42 | 25 | ------ |
| Length, yards | 1,740 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Square yards | ------ | 2,467,171 | 3,885,655 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Hooks | ------ | ------ | ------ | 20 | 32 | 263,541 | ------ | ------ | ------ | ------ |

OPERATING UNITS OF LAKE OF THE WOODS, RAINY LAKE, AND NAMAKAN LAKE: BY GEAR

| Item | Gill nets, "shoal" 4 to 6 inches | Pound nets | Fyke nets | Total, exclusive of duplication |
|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* |
| Fishermen on boats and shore—regular | 63 | 21 | 27 | 79 |
| Boats, motor | 126 | 42 | 54 | 154 |
| Apparatus: | | | | |
| Number | 227 | 77 | 268 | ------ |
| Square yards | 78,963 | ------ | ------ | ------ |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS:[4] BY STATES AND COUNTIES

| Item | New York | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cayuga | Chautauqua | Erie | Jefferson | Monroe | Niagara | Orleans | Oswego | St. Lawrence |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | 85 | | 3 | | | | | |
| On boats and shore— | | | | | | | | | |
| Regular | | 4 | 14 | 54 | 1 | 4 | | 16 | |
| Casual | 1 | 41 | 23 | 9 | 25 | 20 | 4 | 14 | 18 |
| Total | 1 | 130 | 37 | 66 | 26 | 24 | 4 | 30 | 18 |
| Vessels: | | | | | | | | | |
| Steam | | 5 | | | | | | | |
| Net tonnage | | 101 | | | | | | | |
| Motor | | 11 | | 1 | | | | | |
| Net tonnage | | 84 | | 11 | | | | | |
| Total vessels | | 16 | | 1 | | | | | |
| Total net tonnage | | 185 | | 11 | | | | | |
| Boats: | | | | | | | | | |
| Motor | 1 | 4 | 14 | 34 | 7 | 5 | 3 | 7 | |
| Other | 1 | 21 | 15 | 32 | 10 | 15 | 1 | 15 | 18 |
| Apparatus: | | | | | | | | | |
| Haul seines | | 16 | | | | | | | |
| Length, yards | | 1,550 | | | | | | | |
| Gill nets— | | | | | | | | | |
| "Bull," 3 to 3½ inches | | 598 | | | | | | | |
| Square yards | | 137,088 | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 20 | 1,829 | 109 | 168 | 66 | 15 | | 214 | |
| Square yards | 2,160 | 258,665 | 21,550 | 18,588 | 21,120 | 3,762 | | 26,924 | |
| "Shoal," 4 to 6 inches | | 1,870 | 91 | 129 | 4 | 40 | 14 | 476 | |
| Square yards | | 305,124 | 20,283 | 16,400 | 1,280 | 14,300 | 3,920 | 93,440 | |
| Lines— | | | | | | | | | |
| Trot | | 10 | 24 | 3 | | 25 | 1 | 1 | 37 |
| Hooks | | 2,000 | 5,560 | 750 | | 3,000 | 250 | 250 | 41,600 |
| Trap nets | | | 22 | 187 | | | | | |
| Fyke nets | | | | 147 | 7 | | | | |

| Item | New York—Continued | | Pennsylvania | Ohio | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Wayne | Total | Erie | Ashtabula | Cuyahoga | Erie | Lake | Lorain | Lucas |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | 88 | 118 | 14 | 35 | 66 | | 8 | |
| On boats and shore— | | | | | | | | | |
| Regular | 6 | 99 | 34 | 96 | 14 | 198 | 49 | 32 | 74 |
| Casual | 14 | 169 | | 11 | 20 | 49 | 4 | 2 | 25 |
| Total | 20 | 356 | 152 | 121 | 69 | 313 | 53 | 42 | 99 |
| Vessels: | | | | | | | | | |
| Steam | | 5 | 13 | 2 | 5 | 3 | | 1 | |
| Net tonnage | | 101 | 329 | 32 | 192 | 61 | | 32 | |
| Motor | | 12 | 8 | | 1 | 10 | | | |
| Net tonnage | | 95 | 90 | | 9 | 109 | | | |
| Total vessels | | 17 | 21 | 2 | 6 | 13 | | 1 | |
| Total net tonnage | | 196 | 419 | 32 | 201 | 170 | | 32 | |
| Boats: | | | | | | | | | |
| Motor | 10 | 85 | 12 | 30 | 6 | 75 | 18 | 11 | 17 |
| Other | 4 | 132 | 14 | 38 | 7 | 78 | 18 | 11 | 50 |
| Apparatus: | | | | | | | | | |
| Haul seines | | 16 | | | | 12 | 1 | | 16 |
| Length, yards | | 1,550 | | | | 7,898 | 45 | | 4,434 |

[4] Exclusive of the operating units used in the mussel fisheries of streams tributary to the Great Lakes.

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS: BY STATES AND COUNTIES—Continued

| Item | New York—Continued | | Pennsylvania | Ohio | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Wayne | Total | Erie | Ashtabula | Cuyahoga | Erie | Lake | Lorain | Lucas |
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Gill nets— | | | | | | | | | |
| "Bull," 3 to 3½ inches | | 598 | 560 | | | | | | |
| Square yards | | 137,088 | 202,690 | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 291 | 2,712 | 4,344 | 515 | 400 | 3,110 | 1 | 368 | |
| Square yards | 41,795 | 394,564 | 736,320 | 85,035 | 75,504 | 481,788 | 150 | 54,000 | |
| "Shoal," 4 to 6 inches | 302 | 2,926 | 3,198 | | 72 | 65 | 48 | 70 | |
| Square yards | 64,160 | 518,907 | 756,448 | | 19,432 | 11,895 | 8,784 | 11,530 | |
| Trammel nets | | | | | | 94 | | | |
| Square yards | | | | | | 9,882 | | | |
| Lines— | | | | | | | | | |
| Trot | 7 | 108 | | 14 | 2 | 43 | 5 | 3 | 43 |
| Hooks | 5,050 | 58,460 | | 3,450 | 400 | 8,860 | 325 | 120 | 8,350 |
| Pound nets | | | 57 | | 3 | | | | 22 |
| Trap nets | | 209 | 40 | 731 | 90 | 1,562 | 369 | 183 | 197 |
| Fyke nets | | 154 | | | | 44 | | 5 | 296 |
| Dip nets | | | | | 18 | 3 | | | |

| Item | Ohio—Continued | | | Michigan | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ottawa | Sandusky | Total | Alcona | Alger | Allegan | Alpena | Antrim | Arenac |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | | | 123 | | 27 | 4 | 55 | | |
| On boats and shore— | | | | | | | | | |
| Regular | 246 | | 709 | 24 | 32 | 6 | 62 | 3 | 34 |
| Casual | 63 | 6 | 180 | 1 | 9 | | 5 | 3 | 20 |
| Total | 309 | 6 | 1,012 | 25 | 68 | 10 | 122 | 6 | 54 |
| Vessels: | | | | | | | | | |
| Steam | | | 11 | | 3 | | 8 | | |
| Net tonnage | | | 317 | | 44 | | 222 | | |
| Motor | | | 11 | | 4 | 2 | 3 | | |
| Net tonnage | | | 118 | | 27 | 11 | 19 | | |
| Total vessels | | | 22 | | 7 | 2 | 11 | | |
| Total net tonnage | | | 435 | | 71 | 11 | 241 | | |
| Boats: | | | | | | | | | |
| Motor | 53 | | 210 | 10 | 16 | 3 | 34 | 1 | 23 |
| Other | 95 | 3 | 300 | 1 | 10 | | 4 | 4 | 6 |
| Apparatus: | | | | | | | | | |
| Haul seines | 74 | 3 | 106 | | | 1 | | | 17 |
| Length, yards | 55,151 | 924 | 68,452 | | | 333 | | | 7,469 |
| Gill nets— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 160 | | 4,554 | 3 | 80 | 50 | 629 | 6 | 16 |
| Square yards | 11,550 | | 708,027 | 788 | 15,040 | 8,500 | 205,925 | 900 | 4,256 |
| "Shoal," 4 to 6 inches | 24 | | 279 | | 801 | 260 | 1,369 | 12 | |
| Square yards | 2,000 | | 53,641 | | 247,300 | 43,160 | 442,675 | 1,800 | |
| Trammel nets | | | 94 | | | | | | |
| Square yards | | | 9,882 | | | | | | |
| Lines— | | | | | | | | | |
| Hand | 50 | | 50 | | 5 | | | | |
| Hooks | 100 | | 100 | | 5 | | | | |
| Troll | | | | | 16 | | | | |
| Hooks | | | | | 32 | | | | |
| Trot | 13 | | 123 | | 101 | | 26 | | |
| Hooks | 3,168 | | 24,673 | | 49,000 | | 52,000 | | |
| Pound nets | | | 25 | 17 | 7 | 12 | 46 | 4 | 3 |
| Trap nets | 710 | | 3,842 | 34 | | | 165 | | 50 |
| Fyke nets | 203 | | 548 | | | | | | 24 |
| Dip nets | 2 | | 23 | | | | | | |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS: BY STATES AND COUNTIES—Continued

| Item | Michigan—Continued | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Baraga | Bay | Benzie | Berrien | Charlevoix | Cheboygan | Chippewa | Delta | Emmet |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | | 25 | 24 | 69 | 36 | 10 | 56 | 7 |
| On boats and shore— | | | | | | | | | |
| Regular | 16 | 140 | 2 | 9 | 27 | 49 | 67 | 196 | 17 |
| Casual | 12 | 41 | | 16 | 4 | 8 | 13 | 2 | 5 |
| Total | 28 | 181 | 27 | 49 | 100 | 93 | 90 | 254 | 29 |
| Vessels: | | | | | | | | | |
| Steam | | | 4 | 1 | 3 | 1 | 2 | | |
| Net tonnage | | | 56 | 39 | 39 | 11 | 11 | | |
| Motor | | | 4 | 4 | 19 | 13 | 2 | 19 | 2 |
| Net tonnage | | | 65 | 46 | 178 | 117 | 13 | 186 | 12 |
| Total vessels | | | 8 | 5 | 22 | 14 | 4 | 19 | 2 |
| Total net tonnage | | | 121 | 85 | 217 | 128 | 24 | 186 | 12 |
| Boats: | | | | | | | | | |
| Motor | 14 | 69 | 1 | 11 | 13 | 28 | 34 | 81 | 7 |
| Other | 14 | 57 | | 2 | 2 | 5 | 17 | 50 | 7 |
| Apparatus: | | | | | | | | | |
| Haul seines | | 34 | | | | | | | |
| Length, yards | | 17,380 | | | | | | | |
| Gill nets— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 85 | 12 | 315 | 45 | 504 | 157 | 214 | 332 | 21 |
| Square yards | 25,320 | 3,192 | 103,950 | 12,585 | 151,200 | 34,375 | 37,870 | 66,475 | 3,717 |
| "Shoal," 4 to 6 inches | 40 | 177 | 1,074 | 762 | 5,640 | 885 | 729 | 4,516 | 290 |
| Square yards | 10,415 | 50,587 | 550,740 | 252,312 | 1,507,930 | 193,950 | 396,714 | 1,449,585 | 51,330 |
| Lines— | | | | | | | | | |
| Hand | | | | | 1 | | 5 | | |
| Hooks | | | | | 1 | | 5 | | |
| Trot | | 1 | 4 | 3 | 5 | 3 | 61 | 21 | |
| Hooks | | 500 | 4,500 | 8,400 | 9,000 | 1,200 | 19,600 | 27,600 | |
| Pound nets | 11 | 66 | | 2 | 23 | 66 | 74 | 150 | 24 |
| Trap nets | | 584 | | | | 473 | 71 | 83 | 21 |
| Fyke nets | 4 | 35 | | | | | 4 | 51 | |
| Dip nets | | | | 4 | | | | | |

| Item | Michigan—Continued | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gogebic | Grand Traverse | Houghton | Huron | Iosco | Keweenaw | Leelanau | Mackinac | Manistee |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | | 9 | 38 | 18 | 21 | 5 | 51 | 79 | 22 |
| On boats and shore— | | | | | | | | | |
| Regular | 12 | 33 | 96 | 204 | 96 | 43 | 24 | 127 | |
| Casual | 6 | | 18 | 27 | 1 | 2 | 7 | 11 | 4 |
| Total | 18 | 42 | 152 | 249 | 118 | 50 | 82 | 217 | 26 |
| Vessels: | | | | | | | | | |
| Steam | | 1 | 2 | 2 | 1 | | 6 | 1 | |
| Net tonnage | | 9 | 34 | 57 | 15 | | 94 | 8 | |
| Motor | | 2 | 10 | 1 | 5 | 1 | 14 | 27 | 6 |
| Net tonnage | | 17 | 61 | 10 | 68 | 10 | 99 | 228 | 46 |
| Total vessels | | 3 | 12 | 3 | 6 | 1 | 20 | 28 | 6 |
| Total net tonnage | | 26 | 95 | 67 | 83 | 10 | 193 | 236 | 46 |
| Boats: | | | | | | | | | |
| Motor | 9 | 22 | 78 | 87 | 32 | 28 | 16 | 62 | 1 |
| Other | 4 | 5 | 21 | 14 | 3 | 2 | 5 | 13 | 3 |
| Apparatus: | | | | | | | | | |
| Haul seines | 1 | | 6 | 8 | 2 | | | | |
| Length, yards | 90 | | 1,650 | 3,108 | 852 | | | | |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS: BY STATES AND COUNTIES—Continued

| Item | Michigan—Continued | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gogebic | Grand Traverse | Houghton | Huron | Iosco | Keweenaw | Leelanau | Mackinac | Manistee |
| Apparatus—Continued. | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Gill nets— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 33 | 436 | 1,298 | 129 | 4 | 276 | 1,231 | 957 | 131 |
| Square yards | 10,571 | 69,232 | 526,455 | 58,950 | 1,064 | 69,000 | 262,249 | 261,688 | 19,953 |
| "Shoal," 4 to 6 inches | 15 | 240 | 2,400 | 500 | 1,539 | 351 | 2,180 | 2,491 | 826 |
| Square yards | 6,660 | 72,000 | 1,335,023 | 207,575 | 613,724 | 194,580 | 516,633 | 877,610 | 146,412 |
| Lines— | | | | | | | | | |
| Hand | | 1 | 10 | 2 | | | | 3 | |
| Hooks | | 1 | 10 | 2 | | | | 3 | |
| Troll | | 5 | | 1 | | | 8 | | |
| Hooks | | 5 | | 2 | | | 16 | | |
| Trot | 13 | 1 | 84 | 28 | 14 | 36 | 7 | | 8 |
| Hooks | 6,500 | 400 | 38,341 | 35,200 | 19,000 | 22,600 | 4,400 | | 10,000 |
| Pound nets | 1 | 25 | 6 | 221 | 150 | 2 | 12 | 251 | |
| Trap nets | | 12 | | 483 | 1 | | 9 | 70 | |
| Fyke nets | | | | 190 | | | | | |

| Item | Michigan—Continued | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Marquette | Mason | Menominee | Monroe | Muskegon | Oceana | Ontonagon | Ottawa | Presque Isle |
| Fishermen: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| On vessels | 14 | 18 | 14 | | 17 | 7 | 11 | 32 | 27 |
| On boats and shore— | | | | | | | | | |
| Regular | 9 | 3 | 47 | 101 | 18 | 3 | 6 | 22 | 3 |
| Casual | | | | 6 | 6 | | 2 | | 6 |
| Total | 23 | 21 | 61 | 107 | 41 | 10 | 19 | 54 | 36 |
| Vessels: | | | | | | | | | |
| Steam | 1 | | | | 1 | | 2 | 6 | |
| Net tonnage | 41 | | | | 12 | | 51 | 96 | |
| Motor | 2 | 8 | 4 | | 5 | 2 | 1 | 1 | 6 |
| Net tonnage | 17 | 82 | 67 | | 45 | 27 | 6 | 7 | 112 |
| Total vessels | 3 | 8 | 4 | | 6 | 2 | 3 | 7 | 6 |
| Total net tonnage | 58 | 82 | 67 | | 57 | 27 | 57 | 103 | 112 |
| Boats: | | | | | | | | | |
| Motor | 6 | 2 | 22 | 26 | 11 | 1 | 4 | 12 | 6 |
| Other | 1 | | 4 | 31 | 3 | 1 | 4 | | 2 |
| Apparatus: | | | | | | | | | |
| Haul seines | | | | 23 | | | | | |
| Length, yards | | | | 9,385 | | | | | |
| Gill nets— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 127 | | 405 | | 78 | 4 | 240 | 1,014 | 699 |
| Square yards | 14,630 | | 60,605 | | 10,850 | 800 | 40,495 | 214,708 | 310,356 |
| "Shoal," 4 to 6 inches | 190 | 702 | 960 | | 1,391 | 172 | 210 | 1,022 | 201 |
| Square yards | 56,790 | 197,100 | 235,705 | | 226,300 | 40,160 | 86,262 | 218,508 | 89,244 |
| Lines— | | | | | | | | | |
| Trot | 26 | | | | 6 | | 12 | 8 | 72 |
| Hooks | 16,100 | | | | 12,000 | | 6,900 | 17,600 | 28,800 |
| Pound nets | | 6 | 22 | | 7 | | 3 | 15 | |
| Trap nets | | | 4 | 36 | | | | | 10 |
| Fyke nets | | | | 216 | | | | | |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS: BY STATES AND COUNTIES—Continued

| Item | Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Saginaw | Sanilac | Schoolcraft | St. Clair | Tuscola | Van Buren | Wayne | Total |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | |
| On vessels | | | 22 | 11 | 8 | 26 | | 763 |
| On boats and shore— | | | | | | | | |
| Regular | 7 | 15 | 3 | 33 | 16 | 2 | 53 | 1,660 |
| Casual | | | | 4 | | | 4 | 243 |
| Total | 7 | 15 | 25 | 48 | 24 | 28 | 57 | 2,666 |
| Vessels: | | | | | | | | |
| Steam | | | 2 | 2 | | 4 | | 53 |
| Net tonnage | | | 57 | 41 | | 90 | | 1,027 |
| Motor | | | 4 | | 2 | 3 | | 176 |
| Net tonnage | | | 67 | | 14 | 21 | | 1,678 |
| Total vessels | | | 6 | 2 | 2 | 7 | | 229 |
| Total net tonnage | | | 124 | 41 | 14 | 111 | | 2,705 |
| Boats: | | | | | | | | |
| Motor | 1 | 6 | 1 | 12 | 8 | 1 | 13 | 812 |
| Other | 5 | 3 | 1 | 8 | | | 23 | 335 |
| Apparatus: | | | | | | | | |
| Haul seines | 1 | | | | 1 | | 12 | 106 |
| Length, yards | 660 | | | | 220 | | 4,452 | 45,599 |
| Gill nets— | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | | 14 | 130 | 167 | 60 | 258 | | 10,160 |
| Square yards | | 3,350 | 40,000 | 50,150 | 27,000 | 86,100 | | 2,812,299 |
| "Shoal," 4 to 6 inches | | 48 | 705 | 455 | 19 | 744 | | 33,922 |
| Square yards | | 5,130 | 240,575 | 144,400 | 6,300 | 158,800 | | 10,873,989 |
| Lines— | | | | | | | | |
| Hand | | | | 2 | | | | 29 |
| Hooks | | | | 3 | | | | 30 |
| Troll | | | | 2 | | | | 32 |
| Hooks | | | | 12 | | | | 67 |
| Trot | | | 3 | | | 9 | | 552 |
| Hooks | | | 4,500 | | | 19,200 | | 413,341 |
| Pound nets | | 19 | 3 | | 9 | | 4 | 1,261 |
| Trap nets | 25 | | 9 | 26 | 38 | | | 2,204 |
| Fyke nets | | | | 110 | 19 | | 419 | 1,072 |
| Dip nets | | | | | | | | 4 |

| Item | Indiana | | | | Illinois | | | Wisconsin | |
|---|---|---|---|---|---|---|---|---|---|
| | Lake | Laporte | Porter | Total | Cook | Lake | Total | Ashland | Bayfield |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 3 | 14 | | 17 | 21 | 17 | 38 | | 75 |
| On boats and shore— | | | | | | | | | |
| Regular | 2 | 10 | 4 | 16 | 13 | 13 | 26 | 13 | 155 |
| Casual | 2 | | | 2 | | | | 3 | 26 |
| Total | 7 | 24 | 4 | 35 | 34 | 30 | 64 | 16 | 256 |
| Vessels: | | | | | | | | | |
| Steam | | 1 | | 1 | 1 | 1 | 2 | | |
| Net tonnage | | 26 | | 26 | 16 | 13 | 29 | | |
| Motor | 1 | 4 | | 5 | 5 | 3 | 8 | | 12 |
| Net tonnage | 12 | 64 | | 76 | 88 | 45 | 133 | | 148 |
| Total vessels | 1 | 5 | | 6 | 6 | 4 | 10 | | 12 |
| Total net tonnage | 12 | 90 | | 102 | 104 | 58 | 162 | | 148 |
| Boats: | | | | | | | | | |
| Motor | 2 | 6 | 2 | 10 | 5 | 13 | 18 | 11 | 77 |
| Other | 1 | | | 1 | | | | 5 | 29 |
| Apparatus: | | | | | | | | | |
| Gill nets— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 31 | 338 | 18 | 387 | 553 | 640 | 1,193 | 10 | 1,188 |
| Square yards | 4,503 | 91,354 | 3,960 | 99,817 | 81,705 | 178,700 | 260,405 | 4,000 | 566,215 |
| "Shoal," 4 to 6 inches | | 536 | | 536 | 400 | 790 | 1,190 | 175 | 1,865 |
| Square yards | | 150,294 | | 150,294 | 75,480 | 301,295 | 376,775 | 54,095 | 1,198,257 |
| Lines— | | | | | | | | | |
| Trot | | | | | | | | 2 | 43 |
| Hooks | | | | | | | | 800 | 42,045 |
| Pound nets | 2 | 2 | 3 | 7 | | 1 | 1 | | 46 |
| Fyke nets | | | | | | | | 5 | 10 |

*Lake fisheries of the United States, 1930*—Continued

OPERATING UNITS—BY STATES AND COUNTIES—Continued

| Item | Wisconsin—Continued | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Brown | Door | Douglas | Kenosha | Kewaunee | Manitowoc | Marinette | Milwaukee | Oconto |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 52 | 130 | 2 | 21 | 21 | 33 | 37 | 72 | 37 |
| On boats and shore— | | | | | | | | | |
| Regular | 97 | 139 | 4 | 3 | 34 | 16 | 11 | 9 | 41 |
| Casual | 66 | | 6 | | | | 35 | 11 | |
| Total | 215 | 269 | 12 | 24 | 55 | 49 | 83 | 92 | 78 |
| Vessels: | | | | | | | | | |
| Steam | | | | | 1 | 1 | | 14 | |
| Net tonnage | | | | | 19 | 18 | | 309 | |
| Motor | 22 | 50 | 1 | 7 | 6 | 8 | 15 | 2 | 15 |
| Net tonnage | 179 | 523 | 6 | 94 | 70 | 178 | 113 | 47 | 128 |
| Total vessels | 22 | 50 | 1 | 7 | 7 | 9 | 15 | 16 | 15 |
| Total net tonnage | 179 | 523 | 6 | 94 | 89 | 196 | 113 | 356 | 128 |
| Boats: | | | | | | | | | |
| Motor | 31 | 48 | 4 | 1 | 18 | 4 | 4 | 8 | 16 |
| Other | 53 | 10 | 6 | 1 | 1 | 2 | 21 | 4 | 5 |
| Apparatus: | | | | | | | | | |
| Haul seines | 15 | | | | | | | | |
| Length, yards | 4,840 | | | | | | | | |
| Gill nets— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 560 | 2,897 | 40 | 402 | 291 | 626 | 775 | 646 | 965 |
| Square yards | 78,750 | 854,450 | 11,280 | 126,525 | 101,640 | 162,840 | 132,076 | 96,513 | 110,850 |
| "Shoal," 4 to 6 inches | 470 | 5,078 | 40 | 190 | 441 | 110 | 983 | 1,291 | 1,705 |
| Square yards | 77,030 | 2,210,950 | 17,188 | 86,990 | 249,580 | 39,270 | 227,866 | 445,938 | 215,420 |
| Lines— | | | | | | | | | |
| Trot | | 82 | 2 | 9 | 21 | 4 | | 23 | |
| Hooks | | 67,900 | 900 | 17,000 | 28,700 | 4,800 | | 43,200 | |
| Pound nets | 33 | 68 | | | | 30 | 13 | 4 | 1 |
| Fyke nets | 369 | 9 | 2 | | | | 12 | | 66 |
| Crawfish pots | 5,418 | | | | | | | | |

| Item | Wisconsin—Contd. | | | Minnesota | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ozaukee | Sheboygan | Total | Cook | Lake | Koochiching | St. Louis | Roseau and Lake of the Woods | Total |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen: | | | | | | | | | |
| On vessels | 23 | 8 | 511 | | | | 2 | | 2 |
| On boats and shore— | | | | | | | | | |
| Regular | 8 | 13 | 543 | 372 | 89 | 12 | 74 | 60 | 607 |
| Casual | 2 | | 149 | 10 | 18 | | 22 | | 50 |
| Total | 33 | 21 | 1,203 | 382 | 107 | 12 | 98 | 60 | 659 |
| Vessels: | | | | | | | | | |
| Steam | 4 | 2 | 22 | | | | | | |
| Net tonnage | 109 | 90 | 545 | | | | 1 | | 1 |
| Motor | 1 | | 139 | | | | 10 | | 10 |
| Net tonnage | 40 | | 1,526 | | | | | | |
| Total vessels | 5 | 2 | 161 | | | | 1 | | 1 |
| Total net tonnage | 149 | 90 | 2,071 | | | | 10 | | 10 |
| Boats: | | | | | | | | | |
| Motor | 6 | 11 | 239 | 205 | 44 | 24 | 59 | 116 | 448 |
| Other | | 3 | 140 | 176 | 63 | | 44 | | 283 |
| Apparatus: | | | | | | | | | |
| Haul seines | | | 15 | | | | | | |
| Length, yards | | | 4,840 | | | | | | |
| Gill nets:— | | | | | | | | | |
| "Shoal," 2¼ to 3¾ inches | 435 | 10 | 8,845 | 2,446 | 437 | | 745 | | 3,628 |
| Square yards | 83,340 | 2,000 | 2,330,479 | 775,865 | 155,780 | | 223,120 | | 1,154,765 |
| "Shoal," 4 to 6 inches | 365 | 90 | 12,803 | 628 | 85 | 36 | 791 | 167 | 1,707 |
| Square yards | 68,740 | 41,800 | 4,933,124 | 258,515 | 39,970 | 8,400 | 293,950 | 64,963 | 665,798 |
| Lines— | | | | | | | | | |
| Trot | 19 | 9 | 214 | 219 | 11 | | 4 | | 234 |
| Hooks | 52,000 | 13,800 | 271,145 | 54,005 | 4,950 | | 1,800 | | 60,755 |
| Pound nets | 6 | 23 | 224 | | | 12 | 5 | 60 | 77 |
| Fyke nets | | | 473 | | | | | 268 | 268 |
| Crawfish pots | | | 5,418 | | | | | | |

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY GEAR

| Species | New York | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Trot lines | | Trap nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | 591,786 | $28,606 | | | 3,299 | $469 |
| Bowfin | | | | | | | 667 | 22 |
| Burbot | | | 51,864 | 2,490 | | | 35,374 | 2,870 |
| Carp | 20,000 | $1,200 | 20,721 | 852 | | | 4,611 | 253 |
| Catfish and bullheads | 2,000 | 200 | 2,130 | 232 | | | 43,570 | 4,708 |
| Cisco | | | 58,604 | 5,446 | | | | |
| Eels | | | | | 4,800 | $240 | | |
| Lake herring | | | 176,170 | 14,214 | | | 12,930 | 746 |
| Lake trout | | | 19,955 | 3,164 | | | 7,971 | 1,015 |
| Minnows | 109 | 21 | | | | | | |
| Pike (jacks) | | | 707 | 93 | | | 6,137 | 604 |
| Rock bass | | | 240 | 20 | | | 952 | 87 |
| Sturgeon | | | 7,925 | 2,194 | 29,560 | 7,270 | 770 | 211 |
| Sucker "mullet" | 110,000 | 7,000 | 16,679 | 843 | | | 47,378 | 1,637 |
| Sunfish | | | | | | | 8,072 | 369 |
| White bass | | | 398 | 33 | | | 404 | 30 |
| Whitefish, common | | | 193,284 | 39,863 | | | 63,255 | 8,265 |
| Yellow perch | | | 39,525 | 3,127 | | | 17,619 | 859 |
| Yellow pike | | | 2,217 | 342 | | | 24,048 | 4,085 |
| Total | 132,109 | 8,421 | 1,182,205 | 101,519 | 34,360 | 7,510 | 277,057 | 26,230 |

| Species | New York—Continued | | | | Pennsylvania | | | |
|---|---|---|---|---|---|---|---|---|
| | Fyke nets | | Total | | Gill nets | | Pound nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | 595,085 | $29,075 | 1,766,323 | $70,654 | 417,420 | $16,697 |
| Bowfin | 150 | $8 | 817 | 30 | | | | |
| Burbot | 16,739 | 1,069 | 103,977 | 6,429 | 1,101 | 22 | 155 | 3 |
| Carp | 1,928 | 96 | 47,260 | 2,401 | 124 | 5 | 1,579 | 63 |
| Catfish and bullheads | 35,772 | 3,578 | 83,472 | 8,718 | | | 3,471 | 174 |
| Cisco | | | 58,604 | 5,446 | 230,045 | 27,605 | 149 | 18 |
| Eels | 300 | 30 | 5,100 | 270 | | | | |
| Lake herring | | | 189,100 | 14,960 | | | | |
| Lake trout | | | 27,926 | 4,179 | 1,229 | 159 | | |
| Minnows | | | 109 | 21 | | | | |
| Mooneye | | | | | | | 115 | 2 |
| Pike (jacks) | 1,781 | 158 | 8,625 | 855 | | | | |
| Rock bass | | | 1,192 | 107 | | | | |
| Sheepshead | | | | | 468 | 19 | 15,043 | 602 |
| Sturgeon | | | 38,255 | 9,675 | 49 | 13 | 1,770 | 442 |
| Sucker "mullet" | 7,152 | 441 | 181,209 | 9,921 | 5,835 | 117 | 6,906 | 138 |
| Sunfish | 4,368 | 253 | 12,440 | 622 | | | | |
| White bass | | | 802 | 63 | 423 | 21 | 36,844 | 1,844 |
| Whitefish, common | | | 256,539 | 48,128 | 647,043 | 129,408 | 107,900 | 21,580 |
| Yellow perch | 6,947 | 317 | 64,091 | 4,303 | 59,838 | 3,590 | 18,516 | 1,111 |
| Yellow pike | | | 26,265 | 4,427 | 249 | 24 | 13,423 | 1,300 |
| Total | 75,137 | 5,950 | 1,700,868 | 149,630 | 2,712,727 | 231,637 | 623,291 | 43,974 |

| Species | Pennsylvania—Continued | | | | Ohio | | | |
|---|---|---|---|---|---|---|---|---|
| | Trap nets | | Total | | Haul seines | | Gill nets | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | 27,665 | $1,207 | 2,211,408 | $88,558 | 5,327 | $266 | 1,059,912 | $52,996 |
| Bowfin | | | | | 1,042 | 10 | | |
| Burbot | 5,750 | 115 | 7,006 | 140 | 418 | 8 | 25,341 | 506 |
| Carp | 840 | 34 | 2,543 | 102 | 953,950 | 38,158 | 10,921 | 437 |
| Catfish and bullheads | 5,500 | 275 | 8,971 | 449 | 62,710 | 3,136 | 287 | 14 |
| Cisco | | | 230,194 | 27,623 | 325 | 39 | 54,272 | 6,513 |
| Goldfish | | | | | 51,076 | 511 | 245 | 2 |
| Lake trout | | | 1,229 | 159 | | | | |
| Mooneye | | | 115 | 2 | 21,328 | 213 | | |
| Sauger pike | | | | | 12,541 | 627 | 501,090 | 25,055 |
| Sheepshead | 7,450 | 298 | 22,961 | 919 | 477,661 | 14,330 | 16,051 | 482 |
| Sturgeon | 354 | 89 | 2,173 | 544 | | | | |
| Sucker "mullet" | 16,333 | 326 | 29,074 | 581 | 114,870 | 2,297 | 51,949 | 1,039 |
| White bass | 2,000 | 100 | 39,267 | 1,965 | 29,894 | 1,495 | 5,563 | 278 |
| Whitefish, common | | | 754,943 | 150,988 | | | 37,205 | 7,241 |
| Yellow perch | 7,100 | 426 | 85,454 | 5,127 | 5,063 | 202 | 1,536,858 | 61,474 |
| Yellow pike | 9,855 | 975 | 23,527 | 2,299 | 17,891 | 2,147 | 66,927 | 8,031 |
| Total | 82,847 | 3,845 | 3,418,865 | 279,456 | 1,754,096 | 63,439 | 3,366,621 | 164,068 |

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Ohio—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Trammel nets | | Lines | | | | Pound nets | |
| | | | Hand | | Trot | | | |
| | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* | *Pounds* | *Value* |
| Blue pike | | | | | | | 31,123 | $1,556 |
| Burbot | | | | | 73 | $2 | 120 | 2 |
| Carp | 87,648 | $3,506 | | | 3,180 | 160 | 10,615 | 425 |
| Catfish and bullheads | 670 | 33 | | | 16,302 | 1,600 | 3,146 | 157 |
| Mooneye | | | | | | | 9,001 | 90 |
| Sauger pike | | | 2,356 | $259 | | | | |
| Sheepshead | 17,034 | 511 | | | 3,612 | 216 | 2,694 | 81 |
| Sucker, "mullet" | 40 | 1 | | | | | 33,137 | 603 |
| White bass | | | | | 35 | 2 | 4,147 | 207 |
| Whitefish, common | | | | | | | 1,821 | 364 |
| Yellow perch | | | 8,643 | 951 | 307 | 30 | 639 | 25 |
| Yellow pike | 18 | 2 | 11,117 | 2,052 | 34 | 5 | 5,454 | 654 |
| Total | 105,410 | 4,053 | 22,116 | 3,262 | 23,543 | 2,015 | 101,897 | 4,224 |

| Species | Ohio—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Trap nets | | Fyke nets | | Dip nets | | Total | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | 7,919,950 | $395,997 | 153 | $8 | 133 | $13 | 9,016,598 | $450,836 |
| Bowfin | | | 635 | 7 | | | 1,677 | 17 |
| Burbot | 361,768 | 7,235 | 2,201 | 44 | | | 389,921 | 7,797 |
| Carp | 111,114 | 4,445 | 63,777 | 2,551 | 2,041 | 102 | 1,243,246 | 49,784 |
| Catfish and bullheads | 136,507 | 6,825 | 34,559 | 1,728 | 112 | 11 | 254,293 | 13,504 |
| Cisco | 2,614 | 314 | 7 | 1 | | | 57,218 | 6,867 |
| Goldfish | 8,724 | 87 | 3,884 | 39 | | | 63,929 | 639 |
| Mooneye | 2,555 | 26 | 3,314 | 33 | | | 36,198 | 362 |
| Sauger pike | 971,386 | 48,569 | 20,380 | 1,019 | 18 | 2 | 1,507,771 | 75,531 |
| Sheepshead | 2,026,423 | 60,693 | 256,506 | 7,695 | 53 | 4 | 2,800,034 | 84,012 |
| Sturgeon | 217 | 65 | | | | | 217 | 65 |
| Sucker, "mullet" | 1,258,145 | 25,163 | 243,718 | 4,874 | 214 | 10 | 1,702,073 | 34,047 |
| White bass | 328,822 | 16,441 | 75,244 | 3,762 | | | 443,705 | 22,185 |
| Whitefish, common | 557,640 | 112,527 | | | | | 596,666 | 120,132 |
| Yellow perch | 2,588,456 | 103,538 | 46,908 | 1,976 | 63 | 6 | 4,186,937 | 168,202 |
| Yellow pike | 1,424,868 | 170,984 | 288,406 | 34,609 | | | 1,814,715 | 218,484 |
| Total | 17,699,189 | 952,909 | 1,039,692 | 58,346 | 2,634 | 148 | 24,115,198 | 1,252,464 |

| Species | Michigan | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Haul seines | | Gill nets | | Lines | | | |
| | | | | | Hand | | Troll | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bowfin | 8,921 | $177 | | | | | 129 | $2 |
| Burbot | 23 | 1 | 10,673 | $326 | 72 | $3 | | |
| Carp | 1,067,508 | 27,751 | 9,366 | 244 | | | 65 | 1 |
| Catfish and bullheads | 72,754 | 5,840 | 1,312 | 79 | | | 66 | 6 |
| Chubs | 1,010 | 101 | 1,356,828 | 137,891 | | | 22 | 2 |
| Lake herring | 67,777 | 1,761 | 2,500,782 | 62,520 | 106 | 3 | | |
| Lake trout | 84 | 12 | 4,298,523 | 601,793 | 9,285 | 1,301 | 40,136 | 5,619 |
| Pike (jacks) | 9,648 | 965 | 12,216 | 1,221 | 145 | 15 | | |
| Rock bass | 1,881 | 56 | 141 | 4 | | | 84 | 3 |
| Sauger pike | 753 | 45 | 148,203 | 8,892 | | | 291 | 17 |
| Sheepshead | 20,320 | 610 | 346 | 10 | | | | |
| Sucker "mullet" | 592,763 | 15,260 | 313,128 | 7,832 | 220 | 4 | 22 | 1 |
| Whitefish: | | | | | | | | |
| Common | 48 | 7 | 3,067,552 | 409,335 | 2,016 | 308 | 259 | 40 |
| Menominee | 904 | 54 | 250,861 | 15,052 | 58 | 3 | | |
| Yellow perch | 34,680 | 3,225 | 201,643 | 18,752 | | | | |
| Yellow pike | 156,772 | 26,024 | 146,306 | 24,287 | 913 | 152 | 778 | 129 |
| Total | 2,035,846 | 81,889 | 12,317,880 | 1,348,238 | 12,815 | 1,789 | 41,852 | 5,820 |

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Lines—Trot | | Pound nets | | Trap nets | | Fyke nets | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bowfin | 1,065 | $21 | 352 | $7 | 3,145 | $63 | 3,201 | $63 |
| Burbot | 1,058 | 43 | 4,937 | 179 | 3,111 | 120 | 1,380 | 54 |
| Carp | 1,642 | 45 | 31,791 | 834 | 178,127 | 4,632 | 213,347 | 5,549 |
| Catfish and bullheads | 3,006 | 230 | 6,218 | 484 | 56,873 | 4,077 | 53,162 | 2,957 |
| Chubs | 7,300 | 730 | 1,077 | 107 | 12,173 | 920 | 2,980 | 298 |
| Cisco | | | 1,270 | 33 | | | 70 | 2 |
| Lake herring | 4,330 | 108 | 4,896,457 | 122,411 | 144,653 | 3,616 | 17,049 | 426 |
| Lake trout | 1,075,343 | 150,548 | 267,122 | 37,397 | 106,374 | 14,892 | 16,449 | 2,303 |
| Mooneye | | | | | | | 175 | 2 |
| Pike (jacks) | 1,207 | 121 | 10,857 | 1,086 | 47,630 | 4,764 | 25,327 | 2,532 |
| Rock bass | | | 216 | 6 | 6,841 | 205 | 6,546 | 197 |
| Sauger pike | | | 12,238 | 735 | 62,668 | 3,760 | 25,102 | 1,506 |
| Sheepshead | | | 17,472 | 523 | 6,928 | 208 | 38,413 | 1,152 |
| Sucker "mullet" | 1,227 | 28 | 562,961 | 16,149 | 1,781,491 | 47,192 | 413,520 | 10,778 |
| Whitefish: | | | | | | | | |
| Common | 18,417 | 2,818 | 3,812,491 | 583,311 | 890,929 | 136,312 | 12,780 | 1,956 |
| Menominee | | | 52,673 | 3,161 | 1,540 | 92 | 973 | 59 |
| Yellow perch | 4,061 | 377 | 75,872 | 7,057 | 444,223 | 41,313 | 105,011 | 9,776 |
| Yellow pike | 1,797 | 299 | 327,149 | 54,307 | 493,343 | 81,896 | 77,053 | 12,790 |
| Total | 1,120,453 | 155,368 | 10,081,153 | 827,787 | 4,240,049 | 344,062 | 1,012,538 | 52,400 |

| Species | Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Dip nets | | Spears | | Crowfoot bars | | Tongs | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bowfin | | | 93 | $2 | | | | |
| Burbot | 36 | $1 | | | | | | |
| Carp | 518 | 15 | | | | | | |
| Lake herring | 150 | 4 | | | | | | |
| Pike (jacks) | | | 310 | 31 | | | | |
| Smelt | 430 | 4 | | | | | | |
| Sucker "mullet" | 9,039 | 181 | 229 | 11 | | | | |
| Yellow perch | | | 182 | 17 | | | | |
| Mussel shells [4] | | | | | 2,783,400 | $79,846 | 16,000 | $328 |
| Pearls and slugs [4] | | | | | | 6,444 | | 35 |
| Total | 10,173 | 205 | 814 | 61 | 2,783,400 | 86,290 | 16,000 | 363 |

| Species | Michigan—Continued | | | | | | Indiana—Gill nets | |
|---|---|---|---|---|---|---|---|---|
| | Forks | | Picks | | Total | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Bowfin | | | | | 16,906 | $335 | | |
| Burbot | | | | | 21,290 | 727 | 15,798 | $934 |
| Carp | | | | | 1,502,364 | 39,071 | | |
| Catfish and bullheads | | | | | 193,391 | 13,673 | | |
| Chubs | | | | | 1,381,390 | 140,049 | 204,211 | 16,056 |
| Cisco | | | | | 1,340 | 35 | | |
| Lake herring | | | | | 7,631,304 | 190,849 | 210,139 | 10,381 |
| Lake trout | | | | | 5,813,316 | 813,865 | 185,941 | 24,908 |
| Mooneye | | | | | 175 | 2 | | |
| Pike (jacks) | | | | | 107,340 | 10,735 | | |
| Rock bass | | | | | 15,709 | 471 | | |
| Sauger pike | | | | | 249,255 | 14,955 | | |
| Sheepshead | | | | | 83,479 | 2,503 | | |
| Smelt | | | | | 430 | 4 | | |
| Sucker "mullet" | | | | | 3,674,600 | 97,436 | 273 | 13 |
| Whitefish: | | | | | | | | |
| Common | | | | | 7,804,492 | 1,194,087 | 8,565 | 1,291 |
| Menominee | | | | | 307,009 | 18,421 | | |
| Yellow perch | | | | | 865,672 | 80,517 | 10,935 | 944 |
| Yellow pike | | | | | 1,204,111 | 199,884 | | |
| Mussel shells [4] | 306,200 | $6,759 | 1,600,500 | $47,619 | 4,706,100 | 134,552 | | |
| Pearls and slugs [4] | | 698 | | 3,668 | | 10,845 | | |
| Total | 306,200 | 7,457 | 1,600,500 | 51,287 | 35,579,673 | 2,963,016 | 635,862 | 54,527 |

[4] From streams tributary to Lakes Michigan, Huron, and Erie. The mussels shells taken in streams tributary to Lakes Huron and Erie, which were inconsiderable, have been included with those taken in Lake Michigan, State of Michigan, to avoid disclosure of private enterprises.

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Indiana—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pound nets | | Crowfoot bars | | Picks | | Total | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Buffalofish | 400 | $28 | | | | | 400 | $28 |
| Burbot | 175 | 10 | | | | | 15,973 | 944 |
| Carp | 1,512 | 72 | | | | | 1,512 | 72 |
| Chubs | | | | | | | 204,211 | 16,056 |
| Lake herring | 44,552 | 1,012 | | | | | 254,691 | 11,393 |
| Lake trout | 510 | 75 | | | | | 186,451 | 24,983 |
| Sucker "mullet" | 650 | 23 | | | | | 923 | 36 |
| Whitefish, common | 2,130 | 354 | | | | | 10,695 | 1,645 |
| Yellow perch | 1,899 | 184 | | | | | 12,834 | 1,128 |
| Mussel shells [5] | | | 284,000 | $13,900 | 188,000 | $9,300 | 472,000 | 23,200 |
| Pearls and slugs [5] | | | | 687 | | 463 | | 1,150 |
| Total | 51,828 | 1,758 | 284,000 | 14,587 | 188,000 | 9,763 | 1,159,690 | 80,635 |

| Species | Illinois | | | | | | Wisconsin—Haul seines | |
|---|---|---|---|---|---|---|---|---|
| | Gill nets | | Pound nets | | Total | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Carp | | | | | | | 239,730 | $7,191 |
| Catfish and bullheads | | | | | | | 9,569 | 575 |
| Chubs | 538,192 | $46,637 | 2,000 | $180 | 540,192 | $46,817 | | |
| Lake herring | 65,000 | 1,400 | | | 65,000 | 1,400 | | |
| Lake trout | 382,442 | 42,104 | 500 | 60 | 382,942 | 42,164 | | |
| Yellow perch | 75,500 | 6,710 | 1,000 | 100 | 76,500 | 6,810 | | |
| Total | 1,061,134 | 96,851 | 3,500 | 340 | 1,064,634 | 97,191 | 249,299 | 7,766 |

| Species | Wisconsin—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Gill nets | | Lines, trot | | Pound nets | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Burbot | 45,366 | $459 | | | 21,518 | $213 |
| Carp | 119,865 | 3,596 | | | | |
| Catfish and bullheads | 9,569 | 574 | | | | |
| Chubs | 2,624,737 | 176,226 | | | 832,952 | 54,213 |
| Lake herring | 2,226,129 | 40,286 | | | 3,630,173 | 68,242 |
| Lake trout | 1,535,606 | 141,391 | 510,724 | $43,500 | 744,826 | 63,483 |
| Pike (jacks) | 9,028 | 903 | | | 38,828 | 3,883 |
| Sheepshead | 364 | 11 | | | 709 | 21 |
| Sucker "mullet" | 502,053 | 20,330 | | | 251,027 | 10,165 |
| Whitefish: | | | | | | |
| Common | 429,657 | 49,399 | | | 143,220 | 16,467 |
| Menominee | 45,906 | 5,041 | | | 11,666 | 1,392 |
| Yellow perch | 409,202 | 20,460 | | | 204,600 | 10,230 |
| Yellow pike | 13,454 | 622 | | | 7,217 | 362 |
| Total | 7,970,936 | 459,298 | 510,724 | 43,500 | 5,886,736 | 228,671 |

[5] From streams tributary to Lakes Michigan, Huron, and Erie. The mussel shells taken in streams tributary to Lakes Huron and Erie, which were inconsiderable, have been included with those taken in Lake Michigan, State of Michigan, to avoid disclosure of private enterprise.

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Wisconsin—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fyke nets | | Crawfish pots | | Crowfoot bars | | Forks | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Burbot | 21,517 | $212 | | | | | | |
| Carp | 120,118 | 3,604 | | | | | | |
| Catfish and bullheads | 57,667 | 3,460 | | | | | | |
| Chubs | 479,418 | 33,900 | | | | | | |
| Lake herring | 117,440 | 1,761 | | | | | | |
| Pike (jacks) | 19,413 | 1,941 | | | | | | |
| Sheepshead | 1,457 | 44 | | | | | | |
| Sucker "mullet" | 251,026 | 10,165 | | | | | | |
| Whitefish, common | 71,609 | 8,233 | | | | | | |
| Yellow perch | 614,638 | 30,732 | | | | | | |
| Yellow pike | 15,262 | 763 | | | | | | |
| Crawfish | | | 51,273 | $2,514 | | | | |
| Mussel shells [5] | | | | | 70,918 | $1,666 | 35,457 | $832 |
| Pearls and slugs [5] | | | | | | 277 | | 137 |
| Total | 1,769,565 | 94,815 | 51,273 | 2,514 | 70,918 | 1,943 | 35,457 | 969 |

| Species | Wisconsin—Total | | Minnesota | | | |
|---|---|---|---|---|---|---|
| | | | Gill nets | | Lines, trot | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Burbot | 88,401 | $884 | 15,573 | $195 | | |
| Carp | 479,713 | 14,391 | | | | |
| Catfish and bullheads | 76,805 | 4,609 | | | | |
| Chubs | 3,937,107 | 264,339 | 41,386 | 1,072 | | |
| Lake herring | 5,973,742 | 110,289 | 8,367,663 | 190,210 | | |
| Lake trout | 2,791,156 | 248,374 | 196,108 | 27,450 | 97,898 | $13,702 |
| Pike (jacks) | 67,269 | 6,727 | 227,470 | 12,896 | | |
| Sauger pike | | | 49,068 | 2,709 | | |
| Sheepshead | 2,530 | 76 | | | | |
| Sturgeon | | | 652 | 195 | | |
| Sucker "mullet" | 1,004,106 | 40,660 | 112,388 | 2,344 | | |
| Tullibee | | | 604,016 | 15,080 | | |
| Whitefish. | | | | | | |
| Common | 644,486 | 74,099 | 98,888 | 9,323 | | |
| Menominee | 57,572 | 6,433 | 7,554 | 579 | | |
| Yellow perch | 1,228,440 | 61,422 | 2,441 | 122 | | |
| Yellow pike | 35,933 | 1,747 | 470,152 | 46,155 | | |
| Crawfish | 51,273 | 2,514 | | | | |
| Mussel shells [5] | 106,375 | 2,498 | | | | |
| Pearls and slugs [5] | | 414 | | | | |
| Total | 16,544,908 | 839,476 | 10,193,359 | 308,330 | 97,898 | 13,702 |

[5] From streams tributary to Lakes Michigan, Huron, and Erie. The mussel shells taken in streams tributary to Lakes Huron and Erie, which were inconsiderable, have been included with those taken in Lake Michigan, State of Michigan, to avoid disclosure of private enterprise.

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY GEAR—Continued

| Species | Minnesota—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Pound nets | | Fyke nets | | Total | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Buffalofish | 235 | $4 | 472 | $10 | 707 | $14 |
| Burbot | | | | | 15,573 | 195 |
| Carp | 5,489 | 109 | 10,980 | 220 | 16,469 | 329 |
| Catfish and bullheads | 7,985 | 678 | 15,971 | 1,358 | 23,956 | 2,036 |
| Chubs | 57,103 | 1,111 | | | 98,489 | 2,183 |
| Crappie | 3,165 | 559 | 396 | 72 | 3,561 | 631 |
| Goldeye | | | 55 | 2 | 55 | 2 |
| Lake herring | | | | | 8,367,663 | 190,210 |
| Lake trout | | | | | 294,006 | 41,152 |
| Pike (jacks) | 63,116 | 3,156 | 50,584 | 3,288 | 341,170 | 19,340 |
| Sauger pike | 8,178 | 451 | 16,356 | 903 | 73,602 | 4,063 |
| Sturgeon | 977 | 293 | 394 | 118 | 2,023 | 606 |
| Sucker "mullet" | 13,900 | 278 | 27,800 | 556 | 154,088 | 3,178 |
| Tullibee | 301,007 | 7,525 | | | 905,023 | 22,605 |
| Whitefish: | | | | | | |
| Common | 5,514 | 606 | | | 104,402 | 9,929 |
| Menominee | | | | | 7,554 | 579 |
| Yellow perch | 19,292 | 963 | 36,448 | 1,824 | 58,181 | 2,909 |
| Yellow pike | 171,056 | 16,675 | 256,076 | 25,608 | 897,284 | 88,438 |
| Total | 657,017 | 32,408 | 415,532 | 33,959 | 11,363,806 | 388,399 |

CATCH: BY LAKES

| Species | Lake Ontario—New York | | Lake Erie | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | New York | | Pennsylvania | | Ohio | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | 30,753 | $3,222 | 564,332 | $25,853 | 2,211,408 | $88,558 | 9,016,598 | $450,836 |
| Bowfin | 817 | 30 | | | | | 1,677 | 17 |
| Burbot | 95,612 | 6,144 | 8,365 | 285 | 7,006 | 140 | 389,921 | 7,797 |
| Carp | 26,204 | 1,145 | 21,056 | 1,256 | 2,543 | 102 | 1,243,246 | 49,784 |
| Catfish and bullheads | 80,246 | 8,429 | 3,226 | 289 | 8,971 | 449 | 254,293 | 13,504 |
| Cisco | | | 58,604 | 5,446 | 230,194 | 27,623 | 57,218 | 6,867 |
| Eels | 5,100 | 270 | | | | | 63,929 | 639 |
| Goldfish | | | | | | | | |
| Lake herring | 189,100 | 14,960 | | | | | | |
| Lake trout | 24,082 | 3,626 | 3,844 | 553 | 1,229 | 159 | | |
| Minnows | 109 | 21 | | | | | | |
| Mooneye | | | | | 115 | 2 | 36,198 | 362 |
| Pike (jacks) | 8,625 | 855 | | | | | | |
| Rock bass | 705 | 65 | 487 | 42 | | | | |
| Sauger pike | | | | | | | 1,507,771 | 75,531 |
| Sheepshead | | | | | 22,961 | 919 | 2,800,034 | 84,012 |
| Sturgeon | 24,483 | 6,351 | 13,772 | 3,324 | 2,173 | 544 | 217 | 65 |
| Sucker "mullet" | 50,617 | 2,061 | 130,592 | 7,860 | 29,074 | 581 | 1,702,073 | 34,047 |
| Sunfish | 12,440 | 622 | | | | | | |
| White bass | 78 | 15 | 724 | 48 | 39,267 | 1,965 | 443,705 | 22,185 |
| Whitefish, common | 87,400 | 12,584 | 169,139 | 35,544 | 754,943 | 150,988 | 596,666 | 120,132 |
| Yellow perch | 29,943 | 1,943 | 34,148 | 2,360 | 85,454 | 5,127 | 4,186,937 | 168,202 |
| Yellow pike | 15,583 | 2,846 | 10,682 | 1,581 | 23,527 | 2,299 | 1,814,715 | 218,484 |
| Total | 681,897 | 65,189 | 1,018,971 | 84,441 | 3,418,865 | 279,456 | 24,115,198 | 1,252,446 |

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY LAKES—Continued

| Species | Lake Erie—Continued | | | | Lake Huron—Michigan | | Lake Michigan—Michigan | |
|---|---|---|---|---|---|---|---|---|
| | Michigan | | Total | | | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | | | 11,792,338 | 565,247 | | | | |
| Bowfin | 899 | $18 | 2,576 | $35 | 16,007 | $317 | | |
| Burbot | 150 | 6 | 405,442 | 8,228 | 6,879 | 276 | 13,193 | $402 |
| Carp | 594,339 | 15,453 | 1,861,184 | 66,595 | 897,014 | 23,322 | 10,264 | 281 |
| Catfish and bullheads | 56,141 | 3,195 | 322,631 | 17,437 | 134,978 | 10,303 | 1,418 | 99 |
| Chubs | 12,800 | 1,280 | 12,800 | 1,280 | 506,420 | 50,344 | 743,526 | 76,561 |
| Cisco | 1,340 | 35 | 347,356 | 39,971 | | | | |
| Goldfish | | | 63,929 | 639 | | | | |
| Lake herring | | | | | 4,748,345 | 118,709 | 683,963 | 17,098 |
| Lake trout | 10 | 1 | 5,083 | 713 | 1,786,529 | 250,115 | 2,372,546 | 332,155 |
| Mooneye | 175 | 2 | 36,488 | 366 | | | | |
| Pike (jacks) | 8,183 | 818 | 8,183 | 818 | 67,250 | 6,726 | 28,205 | 2,821 |
| Rock bass | 1,721 | 52 | 2,208 | 94 | 13,200 | 396 | 788 | 23 |
| Sauger pike | 22,999 | 1,380 | 1,530,770 | 76,911 | 198,254 | 11,894 | 23,938 | 1,437 |
| Sheepshead | 60,586 | 1,818 | 2,883,581 | 86,749 | 5,859 | 174 | 17,034 | 511 |
| Smelt | | | | | | | 430 | 4 |
| Sturgeon | | | 16,162 | 3,933 | | | | |
| Sucker "mullet" | 154,047 | 5,275 | 2,015,786 | 47,763 | 2,676,949 | 72,077 | 765,888 | 18,099 |
| White bass | | | 483,696 | 24,198 | | | | |
| Whitefish: | | | | | | | | |
| Common | 1,264 | 193 | 1,522,012 | 306,857 | 3,379,776 | 517,105 | 4,218,851 | 645,485 |
| Menominee | 91 | 5 | 91 | 5 | 109,236 | 6,554 | 186,477 | 11,189 |
| Yellow perch | 33,578 | 3,123 | 4,340,117 | 178,812 | 714,949 | 66,499 | 112,762 | 10,487 |
| Yellow pike | 38,784 | 6,439 | 1,887,708 | 228,803 | 1,114,999 | 185,091 | 41,666 | 6,917 |
| Mussel shells [5] | | | | | | | 4,706,100 | 134,552 |
| Pearls and slugs [5] | | | | | | | | 10,845 |
| Total | 987,107 | 39,093 | 29,540,141 | 1,655,454 | 16,376,644 | 1,319,902 | 13,927,049 | 1,268,966 |

| Species | Lake Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Indiana | | Illinois | | Wisconsin | | Total | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| Buffalofish | 400 | $28 | | | | | 400 | $28 |
| Burbot | 15,973 | 944 | | | 86,070 | $849 | 115,236 | 2,195 |
| Carp | 1,512 | 72 | | | 479,461 | 14,383 | 491,237 | 14,736 |
| Catfish and bullheads | | | | | 76,550 | 4,594 | 77,968 | 4,693 |
| Chubs | 204,211 | 16,056 | 540,192 | $46,817 | 3,529,462 | 223,575 | 5,017,391 | 363,009 |
| Lake herring | 254,691 | 11,393 | 65,000 | 1,400 | 5,269,098 | 99,719 | 6,272,752 | 129,610 |
| Lake trout | 186,451 | 24,983 | 382,942 | 42,164 | 2,316,085 | 186,615 | 5,258,024 | 585,917 |
| Pike (jacks) | | | | | 58,241 | 5,824 | 86,446 | 8,645 |
| Rock bass | | | | | | | 788 | 23 |
| Sauger pike | | | | | | | 23,938 | 1,437 |
| Sheepshead | | | | | 1,821 | 55 | 18,855 | 566 |
| Smelt | | | | | | | 430 | 4 |
| Sucker "mullet" | 923 | 36 | | | 1,004,106 | 40,660 | 1,770,917 | 58,795 |
| Whitefish: | | | | | | | | |
| Common | 10,695 | 1,645 | | | 559,028 | 63,844 | 4,788,574 | 710,974 |
| Menominee | | | | | 35,000 | 4,176 | 221,477 | 15,365 |
| Yellow perch | 12,834 | 1,128 | 76,500 | 6,810 | 1,227,604 | 61,380 | 1,429,700 | 79,805 |
| Yellow pike | | | | | 21,710 | 1,086 | 63,376 | 8,003 |
| Crawfish | | | | | 51,273 | 2,514 | 51,273 | 2,514 |
| Mussel shells [5] | 472,000 | 23,200 | | | 106,375 | 2,498 | 5,284,475 | 160,250 |
| Pearls and slugs [5] | | 1,150 | | | | 414 | | 12,409 |
| Total | 1,159,690 | 80,635 | 1,064,634 | 97,191 | 14,821,884 | 712,186 | 30,973,257 | 2,158,978 |

[5] From streams tributary to Lakes Michigan, Huron, and Erie. The mussel shells taken in streams tributary to Lakes Huron and Erie, which were inconsiderable, have been included with those taken in Lake Michigan, State of Michigan, to avoid disclosure of private enterprise.

*Lake fisheries of the United States, 1930*—Continued

CATCH: BY LAKES—Continued

| Species | Lake Superior | | | | | |
|---|---|---|---|---|---|---|
| | Michigan | | Wisconsin | | Minnesota | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Burbot | 1,068 | $43 | 2,331 | $35 | | |
| Carp | 747 | 15 | 252 | 8 | | |
| Catfish and bullheads | 854 | 76 | 255 | 15 | | |
| Chubs | 118,644 | 11,864 | 407,645 | 40,764 | 268 | $16 |
| Lake herring | 2,198,996 | 55,042 | 704,644 | 10,570 | 8,367,663 | 190,210 |
| Lake trout | 1,654,231 | 231,594 | 475,071 | 61,759 | 293,696 | 41,106 |
| Pike (jacks) | 3,702 | 370 | 9,028 | 903 | 70 | 6 |
| Sauger pike | 4,064 | 244 | | | | |
| Sheepshead | | | 709 | 21 | | |
| Sucker "mullet" | 77,716 | 1,985 | | | 8,575 | 267 |
| Whitefish: | | | | | | |
| Common | 204,601 | 31,304 | 85,458 | 10,255 | 4,620 | 728 |
| Menominee | 11,205 | 673 | 22,572 | 2,257 | 7,554 | 579 |
| Yellow perch | 4,383 | 408 | 836 | 42 | | |
| Yellow pike | 8,662 | 1,437 | 14,223 | 661 | | |
| Total | 4,288,873 | 335,055 | 1,723,024 | 127,290 | 8,682,446 | 232,912 |

| Species | Lake Superior—Total | | Lake of the Woods, Rainy Lake, and Namakan Lake—Minnesota | | Total, all lakes | |
|---|---|---|---|---|---|---|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Blue pike | | | | | 11,823,091 | $568,469 |
| Bowfin | | | | | 19,400 | 382 |
| Buffalofish | | | 707 | $14 | 1,107 | 42 |
| Burbot | 3,399 | $78 | 15,573 | 195 | 642,141 | 17,116 |
| Carp | 999 | 23 | 16,469 | 329 | 3,293,107 | 106,150 |
| Catfish and bullheads | 1,109 | 91 | 23,956 | 2,036 | 640,888 | 42,989 |
| Chubs | 526,557 | 52,644 | 98,221 | 2,167 | 6,161,389 | 469,444 |
| Cisco | | | | | 347,356 | 39,971 |
| Crappie | | | 3,561 | 631 | 3,561 | 631 |
| Eels | | | | | 5,100 | 270 |
| Goldeye | | | 55 | 2 | 55 | 2 |
| Goldfish | | | | | 63,929 | 639 |
| Lake herring | 11,271,303 | 255,822 | | | 22,481,500 | 519,101 |
| Lake trout | 2,422,998 | 344,459 | 310 | 46 | 9,497,026 | 1,174,876 |
| Minnows | | | | | 109 | 21 |
| Mooneye | | | | | 36,488 | 366 |
| Pike (jacks) | 12,800 | 1,279 | 341,100 | 19,334 | 524,404 | 37,657 |
| Rock bass | | | | | 16,901 | 578 |
| Sauger pike | 4,064 | 244 | 73,602 | 4,063 | 1,830,628 | 94,549 |
| Sheepshead | 709 | 21 | | | 2,909,004 | 87,510 |
| Smelt | | | | | 430 | 4 |
| Sturgeon | | | 2,023 | 606 | 42,668 | 10,890 |
| Sucker "mullet" | 86,291 | 2,252 | 145,513 | 2,911 | 6,746,073 | 185,859 |
| Sunfish | | | | | 12,440 | 622 |
| Tullibee | | | 905,023 | 22,605 | 905,023 | 22,605 |
| White bass | | | | | 483,774 | 24,213 |
| Whitefish: | | | | | | |
| Common | 294,679 | 42,287 | 99,782 | 9,201 | 10,172,223 | 1,599,008 |
| Menominee | 41,331 | 3,509 | | | 372,135 | 25,433 |
| Yellow perch | 5,219 | 450 | 58,181 | 2,909 | 6,578,109 | 330,418 |
| Yellow pike | 22,885 | 2,098 | 897,284 | 88,438 | 4,001,835 | 515,279 |
| Crawfish | | | | | 51,273 | 2,514 |
| Mussel shells [5] | | | | | 5,284,475 | 160,250 |
| Pearls and slugs [5] | | | | | | 12,409 |
| Total | 14,694,343 | 695,257 | 2,681,360 | 155,487 | 94,947,642 | 6,050,267 |

[5] From streams tributary to Lakes Michigan, Huron, and Erie. The mussel shells taken in streams tributary to Lakes Huron and Erie, which were inconsiderable, have been included with those taken in Lake Michigan, State of Michigan, to avoid disclosure of private enterprise.

*Industries related to the fisheries of the Lake States, 1930*

| Item | New York | Pennsylvania | Ohio | Michigan |
|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | | 3 | 18 | 16 |
| Vessels— | | | | |
| Steam | | 1 | 2 | |
| Net tonnage | | 17 | 41 | |
| Motor | | | 6 | 7 |
| Net tonnage | | | 66 | 95 |
| Total vessels | | 1 | 8 | 7 |
| Total net tonnage | | 17 | 107 | 95 |
| Wholesale and manufacturing: | | | | |
| Establishments | 16 | 7 | 34 | 59 |
| Persons engaged— | | | | |
| Proprietors | 21 | 14 | 56 | 75 |
| Salaried employees | 28 | 6 | 58 | 55 |
| Wage earners: | | | | |
| Average for season | 67 | 57 | 199 | 246 |
| Average for year | 65 | 57 | 191 | 209 |
| Salaries and wages paid | $144,572 | $93,733 | $486,247 | $442,746 |
| Manufactured products [1] | $98,054 | $74,031 | $268,025 | $270,712 |
| Fishermen's prepared products: | | | | |
| Persons engaged | 8 | 3 | 5 | 162 |
| Products | $356 | $98 | $5,400 | $81,876 |

| Item | Indiana | Illinois | Wisconsin | Minnesota | Total |
|---|---|---|---|---|---|
| Transporting: | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged | | | 13 | 26 | 76 |
| Vessels— | | | | | |
| Steam | | | 1 | 2 | 6 |
| Net tonnage | | | 28 | 107 | 193 |
| Motor | | | 1 | 2 | 16 |
| Net tonnage | | | 19 | 69 | 249 |
| Total vessels | | | 2 | 4 | 22 |
| Total net tonnage | | | 47 | 176 | 442 |
| Wholesale and manufacturing: | | | | | |
| Establishments | 4 | 47 | 40 | 21 | 228 |
| Persons engaged— | | | | | |
| Proprietors | 4 | 66 | 49 | 21 | 306 |
| Salaried employees | 1 | 166 | 34 | 27 | 375 |
| Wage earners: | | | | | |
| Average for season | 5 | 366 | 250 | 140 | 1,330 |
| Average for year | 5 | 327 | 145 | 103 | 1,102 |
| Salaries and wages paid | $11,500 | $1,353,091 | $280,256 | $173,843 | $2,985,988 |
| Manufactured products [1] | $20,555 | $631,051 | $298,487 | $102,290 | $1,763,205 |
| Fishermen's prepared products: | | | | | |
| Persons engaged | 3 | 20 | 153 | 212 | 566 |
| Products | $2,750 | $43,632 | $44,178 | $78,743 | $257,033 |

[1] These production figures are not comparable with those shown in previous bulletins, since packaged fresh and frozen fishery products are now included.

NOTE.—Of the total number of persons employed on transporting craft, 21 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 545 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of New York, 1930*

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Chautauqua, Jefferson, and Oswego Counties | Erie County | Total |
|---|---|---|---|
| Establishments | 5 | 11 | 16 |
| Persons engaged: | | | |
| Proprietors | 5 | 16 | 21 |
| Salaried employees | 7 | 21 | 28 |
| Wage earners— | | | |
| Average for season | 14 | 53 | 67 |
| Average for year | 14 | 51 | 65 |
| Paid to salaried employees | $9,950 | $59,301 | $69,251 |
| Paid to wage earners | 13,250 | 62,071 | 75,321 |
| Total salaries and wages | 23,200 | 121,372 | 144,572 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Blue pike, fresh fillets ... pounds | 50,200 | $12,332 |
| Unclassified products: | | |
| Smoked [1] ... do | 313,100 | 84,690 |
| Miscellaneous [2] | (3) | 1,032 |
| Total | | 98,054 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 8]

| | | |
|---|---|---|
| Sturgeon roe, salted ... pounds | 330 | $356 |

[1] Includes smoked eels, salmon, sturgeon, tullibee, and whitefish.
[2] Includes pickled herring, cisco caviar, salted cisco, and whitefish.
[3] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 8 have also been included as fishermen. This fact should be considered in computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of Pennsylvania, 1930*

TRANSPORTING IN ERIE COUNTY

| | |
|---|---|
| Persons engaged on vessels | 3 |
| Vessels, steam | 1 |
| Net tonnage | 17 |

WHOLESALE AND MANUFACTURING IN ERIE COUNTY

OPERATING UNITS, SALARIES, AND WAGES

| | |
|---|---|
| Establishments | 7 |
| Persons engaged: | |
| Proprietors | 14 |
| Salaried employees | 6 |
| Wage earners— | |
| Average for season | 57 |
| Average for year | 57 |
| Paid to salaried employees | $31,845 |
| Paid to wage earners | 61,888 |
| Total salaries and wages | 93,733 |

*Industries related to the lake fisheries of Pennsylvania, 1930*—Continued

WHOLESALE AND MANUFACTURING IN ERIE COUNTY—Continued

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Blue pike, frozen fillets ..... pounds | 111,250 | $22,250 |
| Miscellaneous, fresh fillets [1] ..... do | 251,086 | 51,781 |
| Total | 362,336 | 74,031 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 3]

| | | |
|---|---|---|
| Sturgeon roe, salted ..... pounds | 78 | $98 |

[1] Includes fresh blue pike and yellow perch fillets.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 3 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 3 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of Ohio, 1930*

TRANSPORTING

| Item | Erie County | Lake County | Lucas County | Ottawa County | Total |
|---|---|---|---|---|---|
| | *Number* | *Number* | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 10 | 3 | 2 | 3 | 18 |
| Vessels: | | | | | |
| Steam— | | | | | |
| 5 to 10 tons | | | | 1 | 1 |
| 30 to 40 tons | | 1 | | | 1 |
| Total | | 1 | | 1 | 2 |
| Net tonnage | | 31 | | 10 | 41 |
| Motor— | | | | | |
| 5 to 10 tons | 3 | | 1 | | 4 |
| 11 to 20 tons | 2 | | | | 2 |
| Total | 5 | | 1 | | 6 |
| Net tonnage | 60 | | 6 | | 66 |
| Total vessels | 5 | 1 | 1 | 1 | 8 |
| Total net tonnage | 60 | 31 | 6 | 10 | 107 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Ashtabula and Lake Counties | Cuyahoga and Lorain Counties | Erie County | Lucas and Ottawa Counties | Total |
|---|---|---|---|---|---|
| Establishments | 7 | 11 | 11 | 5 | 34 |
| Persons engaged: | | | | | |
| Proprietors | 8 | 17 | 23 | 8 | 56 |
| Salaried employees | 7 | 19 | 22 | 10 | 58 |
| Wage earners— | | | | | |
| Average for season | 25 | 87 | 70 | 17 | 199 |
| Average for year | 25 | 79 | 70 | 17 | 191 |
| Paid to salaried employees | $20,987 | $64,787 | $89,732 | $42,688 | $218,194 |
| Paid to wage earners | 32,728 | 97,152 | 113,952 | 24,221 | 268,053 |
| Total salaries and wages | 53,715 | 161,939 | 203,684 | 66,909 | 486,247 |

*Industries related to the lake fisheries of Ohio, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Blue pike, fresh fillets | pounds | 302,046 | $60,659 |
| Salmon, smoked | do | 176,250 | 67,950 |
| Sturgeon, smoked | do | 11,646 | 7,535 |
| Tullibee, smoked | do | 281,898 | 58,580 |
| Whitefish, smoked | do | 58,741 | 17,982 |
| Yellow perch, fresh fillets | do | 132,993 | 27,369 |
| Miscellaneous [1] | do | 111,069 | 27,950 |
| Total | | 1,074,643 | 268,025 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 5]

| | | | |
|---|---|---|---|
| Blue pike, fresh fillets | pounds | 19,500 | $3,900 |
| Yellow perch, fresh fillets | do | 5,700 | 1,500 |
| Total | | 25,200 | 5,400 |

[1] Includes frozen fillets of blue pike, smoked cisco and sablefish.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 16 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products, 4 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of Michigan, 1930*

TRANSPORTING

| Item | Cheboygan County | Mackinac County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 14 | 2 | 16 |
| Vessels, motor: | | | |
| 5 to 10 tons | 3 | | 3 |
| 11 to 20 tons | 1 | 1 | 2 |
| 21 to 30 tons | 2 | | 2 |
| Total | 6 | 1 | 7 |
| Net tonnage | 81 | 14 | 95 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Bay and Arenac Counties | Berrien and Ottawa Counties | Cheboygan and Alpena Counties | Charlevoix and Grand Traverse Counties | Huron County |
|---|---|---|---|---|---|
| Establishments | 7 | 6 | 6 | 6 | 5 |
| Persons engaged: | | | | | |
| Proprietors | 12 | 8 | 5 | 3 | 7 |
| Salaried employees | 7 | | 6 | 5 | 3 |
| Wage earners— | | | | | |
| Average for season | 26 | 26 | 12 | 8 | 21 |
| Average for year | 18 | 23 | 11 | 8 | 21 |
| Paid to salaried employees | $20,600 | $10,150 | $9,650 | $9,380 | $9,500 |
| Paid to wage earners | 21,050 | 28,900 | 9,467 | 8,050 | 23,200 |
| Total salaries and wages | 41,650 | 39,050 | 19,117 | 17,430 | 32,700 |

*Industries related to the lake fisheries of Michigan, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

OPERATING UNITS, SALARIES, AND WAGES—Continued

| Item | Mackinac, Chippewa, Delta, and Schoolcraft Counties | Menominee, Houghton, and Marquette Counties | Newaygo, Mason, and Muskegon Counties | Wayne and St. Clair Counties | Total |
|---|---|---|---|---|---|
| Establishments | 9 | 3 | 3 | 14 | 59 |
| Persons engaged: | | | | | |
| Proprietors | 9 | 3 | 4 | 24 | 75 |
| Salaried employees | 6 | 3 | | 25 | 55 |
| Wage earners— | | | | | |
| Average for season | 25 | 34 | 22 | 72 | 246 |
| Average for year | 21 | 24 | 22 | 61 | 209 |
| Paid to salaried employees | $15,990 | $11,900 | $2,000 | $118,800 | $207,970 |
| Paid to wage earners | 23,870 | 24,440 | 22,700 | 73,099 | 234,776 |
| Total salaries and wages | 39,860 | 36,340 | 24,700 | 191,899 | 442,746 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Chubs, smoked | pounds | 407,700 | $106,660 |
| Lake herring: | | | |
| Salted | do | 2,423,040 | 81,730 |
| Smoked | do | 9,600 | 1,780 |
| Lake trout, smoked | do | 34,900 | 7,860 |
| Whitefish, smoked | do | 49,800 | 11,590 |
| Fresh-water mussel button blanks | gross | 156,740 | 28,122 |
| Miscellaneous [1] | | (2) | 32,970 |
| Total | | | 270,712 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 162]

| | | | |
|---|---|---|---|
| Chubs, smoked | pounds | 22,000 | $6,500 |
| Lake herring: | | | |
| Salted | do | 1,034,466 | 29,857 |
| Smoked | do | 76,560 | 7,956 |
| Lake trout: | | | |
| Salted | do | 168,750 | 25,312 |
| Smoked | do | 8,200 | 2,275 |
| Whitefish: | | | |
| Salted | do | 100,000 | 7,000 |
| Smoked | do | 9,900 | 2,500 |
| Caviar, fresh | do | 950 | 476 |
| Total | | 1,420,826 | 81,876 |

[1] Includes smoked carp, Menominee, salmon, Russian sturgeon, and tullibee; and fresh fillets of lake trout and whitefish.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons employed on transporting craft, 2 have also been included as fishermen, and among the total persons engaged in the preparation of fishermen's manufactured products 162 have been included as fishermen. These facts should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of Indiana, 1930*

WHOLESALE AND MANUFACTURING IN LA PORTE COUNTY

OPERATING UNITS, SALARIES, AND WAGES

| | |
|---|---|
| Establishments | 4 |
| Persons engaged: | |
| Proprietors | 4 |
| Salaried employees | 1 |
| Wage earners— | |
| Average for season | 5 |
| Average for year | 5 |
| Paid to salaried employees | $5,500 |
| Paid to wage earners | 6,000 |
| Total salaries and wages | 11,500 |

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Chubs, smoked | pounds | 74,600 | $18,650 |
| Miscellaneous [1] | | (2) | 1,905 |
| Total | | | 20,555 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 3]

| | | | |
|---|---|---|---|
| Chubs, smoked | pounds | 7,500 | $1,875 |
| Lake trout, smoked | do | 2,500 | 625 |
| Whitefish, smoked | do | 1,000 | 250 |
| Total | | 11,000 | 2,750 |

[1] Includes smoked lake trout and fish oil.
[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 3 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of Illinois, 1930*

WHOLESALE AND MANUFACTURING IN COOK COUNTY

OPERATING UNITS, SALARIES, AND WAGES

| | |
|---|---|
| Establishments | 47 |
| Persons engaged: | |
| Proprietors | 66 |
| Salaried employees | 166 |
| Wage earners— | |
| Average for season | 366 |
| Average for year | 327 |
| Paid to salaried employees | $750,880 |
| Paid to wage earners | 602,211 |
| Total salaries and wages | 1,353,091 |

*Industries related to the lake fisheries of Illinois, 1930*—Continued

WHOLESALE AND MANUFACTURING IN COOK COUNTY—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Chubs, smoked | pounds | 772,600 | $189,056 |
| Eels, smoked | do | 20,334 | 6,810 |
| Lake trout, smoked | do | 23,390 | 5,654 |
| Salmon, smoked | do | 610,330 | 221,100 |
| Tullibee, smoked | do | 437,800 | 86,856 |
| Miscellaneous [1] | do | 602,366 | 121,575 |
| Total | | 2,466,820 | 631,051 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 20]

| | | | |
|---|---|---|---|
| Chubs, smoked | pounds | 131,300 | $34,997 |
| Eels, smoked | do | 400 | 180 |
| Lake herring, smoked | do | 20,000 | 2,000 |
| Lake trout, smoked | do | 15,000 | 4,500 |
| Sturgeon, smoked | do | 2,650 | 1,430 |
| Whitefish, smoked | do | 1,500 | 525 |
| Total | | 170,850 | 43,632 |

[1] Includes smoked buffalofish, butterfish, carp, ciscoes, lake herring, flounders, sea herring, sturgeon, and shad; and pickled sea herring.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State.

*Industries related to the lake fisheries of Wisconsin, 1930*

TRANSPORTING

| Item | Bayfield County | Menominee County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 10 | 3 | 13 |
| Vessels: | | | |
| Motor | | 1 | 1 |
| Net tonnage | | 19 | 19 |
| Steam | 1 | | 1 |
| Net tonnage | 28 | | 28 |
| Total | 1 | 1 | 2 |
| Net tonnage | 28 | 19 | 47 |

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Bayfield and Ashland Counties | Brown County | Douglas County | Manitowoc and Waupaca Counties | Marinette County | Milwaukee County | Ozaukee and Kenosha Counties | Total |
|---|---|---|---|---|---|---|---|---|
| Establishments | 4 | 7 | 4 | 3 | 3 | 15 | 4 | 40 |
| Persons engaged: | | | | | | | | |
| Proprietors | 3 | 9 | 4 | 3 | 3 | 18 | 9 | 49 |
| Salaried employees | 4 | 12 | | 2 | | 14 | 2 | 34 |
| Wage earners— | | | | | | | | |
| Average for season | 55 | 67 | 8 | 25 | 17 | 48 | 30 | 250 |
| Average for year | 14 | 36 | 7 | 9 | 10 | 43 | 26 | 145 |
| Paid to salaried employees | $8,650 | $26,621 | $3,900 | $1,050 | | $34,200 | $42,708 | $117,129 |
| Paid to wage earners | 15,840 | 45,328 | 5,000 | 8,855 | $10,754 | 54,250 | 23,100 | 163,127 |
| Total salaries and wages | 24,490 | 71,949 | 8,900 | 9,905 | 10,754 | 88,450 | 65,808 | 280,256 |

*Industries related to the lake fisheries of Wisconsin, 1930*—Continued

WHOLESALE AND MANUFACTURING—Continued

PRODUCTS MANUFACTURED

| Item | | Quantity | Value |
|---|---|---|---|
| Chubs, smoked | pounds | 528,472 | $102,991 |
| Lake herring: | | | |
| Salted | do | 922,000 | 28,413 |
| Spiced | do | 95,000 | 13,350 |
| Smoked | do | 302,280 | 26,934 |
| Lake trout, smoked | do | 198,281 | 42,978 |
| Salmon, smoked | do | 85,760 | 14,937 |
| Tullibee, smoked | do | 78,235 | 15,272 |
| Whitefish, smoked | do | 81,449 | 16,640 |
| Miscellaneous [1] | | (2) | 36,972 |
| Total | | | 298,487 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 153]

| | | | |
|---|---|---|---|
| Chubs, smoked | pounds | 20,000 | $4,400 |
| Lake herring, salted | do | 1,444,497 | 39,228 |
| Lake trout, smoked | do | 2,500 | 550 |
| Total | | 1,466,997 | 44,178 |

[1] Includes pickled lake herring and lake trout; salted lake trout and whitefish; fresh fillets of blue pike, jack pike, sauger, and yellow perch; canned whitefish caviar; poultry feed and lime from mussel shells; and novelties and button blanks from fresh-water mussel shells.

[2] Data not available.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 153 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Industries related to the lake fisheries of Minnesota, 1930*

TRANSPORTING

| Item | Roseau County | St. Louis County | Total |
|---|---|---|---|
| | *Number* | *Number* | *Number* |
| Persons engaged on vessels | 6 | 20 | 26 |
| Vessels: | | | |
| Steam— | | | |
| 31 to 40 tons | | 1 | 1 |
| 71 to 80 tons | | 1 | 1 |
| Total | | 2 | 2 |
| Net tonnage | | 107 | 107 |
| Motor— | | | |
| 5 to 10 tons | 1 | | 1 |
| 61 to 70 tons | 1 | | 1 |
| Total | 2 | | 2 |
| Net tonnage | 69 | | 69 |
| Total vessels | 2 | 2 | 4 |
| Total net tonnage | 69 | 107 | 176 |

*Industries related to the lake fisheries of Minnesota, 1930*—Continued

WHOLESALE AND MANUFACTURING

OPERATING UNITS, SALARIES, AND WAGES

| Item | Cook, Lake, Lake of the Woods, Koochiching and Roseau Counties | St. Louis County | Total |
|---|---|---|---|
| Establishments | 7 | 14 | 21 |
| Persons engaged: | | | |
| Proprietors | 6 | 15 | 21 |
| Salaried employees | 6 | 21 | 27 |
| Wage earners— | | | |
| Average for season | 33 | 107 | 140 |
| Average for year | 15 | 88 | 103 |
| Paid to salaried employees | $9,760 | $48,760 | $58,520 |
| Paid to wage earners | 17,672 | 97,651 | 115,323 |
| Total salaries and wages | 27,432 | 146,411 | 173,843 |

PRODUCTS MANUFACTURED

| Item | Quantity | Value |
|---|---|---|
| Tullibee, smoked ... pounds | 59,000 | $6,000 |
| Unclassified products: | | |
| Salted [1] ... do | 448,200 | 44,038 |
| Smoked [2] ... do | 171,400 | 52,252 |
| Total | 678,600 | 102,290 |

FISHERMEN'S MANUFACTURED PRODUCTS

[Number of persons engaged, 212]

| | | |
|---|---|---|
| Lake herring: | | |
| Salted ... pounds | 2,195,500 | $65,873 |
| Smoked ... do | 102,000 | 10,200 |
| Lake trout, smoked ... do | 8,500 | 2,550 |
| Whitefish, smoked ... do | 1,200 | 120 |
| Total | 2,307,200 | 78,743 |

[1] Includes salted Alaska herring, alewives, lake herring, mackerel, salmon, lake trout, and sablefish.

[2] Includes smoked ciscoes, lake herring, salmon fillets, and lake herring fillets.

NOTE.—Some of the above products may have been manufactured from fishery products imported from another State or country; therefore, they can not be correlated directly with the catch within the State. Of the total number of persons engaged in the preparation of fishermen's manufactured products, 212 have also been included as fishermen. This fact should be considered when computing the total number of persons in the fishery industries exclusive of duplication.

*Mussel-shell industry of the lake fisheries, 1930* [1]

OPERATING UNITS

| Item | Lake Michigan | | | | | | |
|---|---|---|---|---|---|---|---|
| | St. Joseph River | | | Grand River | Kalamazoo River | Muskegon River | Elkhart River |
| | Michigan | Indiana | Total | Michigan | Michigan | Michigan | Indiana |
| | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Fishermen—On boats and shore, casual | 250 | 30 | 280 | 306 | 50 | 140 | 12 |
| Boats: | | | | | | | |
| Motor | 80 | 10 | 90 | 164 | 20 | 70 | 12 |
| Other | 170 | 20 | 190 | 149 | 30 | 70 | ---------- |
| Apparatus: | | | | | | | |
| Crowfoot bars | 80 | 10 | 90 | 137 | 20 | ---------- | 12 |
| Tongs | ---------- | ---------- | ---------- | 12 | ---------- | ---------- | ---------- |
| Forks | ---------- | ---------- | ---------- | 98 | 25 | ---------- | ---------- |
| Picks | 230 | 30 | 260 | 176 | 50 | 140 | 12 |

[1] The mussel-shell industry of streams tributary to Lakes Huron and Erie, which was inconsiderable, has been included with the St. Joseph River tributary to Lake Michigan, State of Michigan to avoid disclosure of private enterprise.

*Mussel-shell industry of the lake fisheries, 1930*—Continued

OPERATING UNITS—Continued

| Item | Lake Michigan—Continued | | | | | | |
|---|---|---|---|---|---|---|---|
| | Pigeon River | Fox River | Grand River | Total, all rivers | | | Grand total |
| | Indiana | Wisconsin | Wisconsin | Michigan | Indiana | Wisconsin | |
| Fishermen—On boats and shore: | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* | *Number* |
| Regular | | 4 | 5 | | | 9 | 9 |
| Casual | 18 | 12 | 6 | 746 | 60 | 18 | 824 |
| Total | 18 | 16 | 11 | 746 | 60 | 27 | 833 |
| Boats: | | | | | | | |
| Motor | 8 | 12 | 5 | 334 | 30 | 17 | 381 |
| Other | 10 | 4 | 6 | 419 | 30 | 10 | 459 |
| Apparatus: | | | | | | | |
| Crowfoot bars | 8 | 12 | 6 | 237 | 30 | 18 | 285 |
| Tongs | | | | 12 | | | 12 |
| Forks | | 8 | 5 | 123 | | 13 | 136 |
| Picks | 18 | | | 596 | 60 | | 656 |

CATCH

| Gear and product | Lake Michigan | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | St. Joseph River | | | | | | Grand River, Mich. | |
| | Michigan | | Indiana | | Total | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Value |
| By crowfoot bars: | | | | | | | | |
| Mussel shells | 612,000 | $31,518 | 180,000 | $9,750 | 792,000 | $41,268 | 1,947,400 | $40,208 |
| Pearls and slugs | | 1,500 | | 450 | | 1,950 | | 4,480 |
| By tongs: | | | | | | | | |
| Mussel shells | | | | | | | 16,000 | 328 |
| Pearls and slugs | | | | | | | | 35 |
| By forks: | | | | | | | | |
| Mussel shells | | | | | | | 278,200 | 5,744 |
| Pearls and slugs | | | | | | | | 640 |
| By picks: | | | | | | | | |
| Mussel shells | 401,000 | 21,502 | 120,000 | 6,500 | 521,000 | 28,002 | 679,500 | 14,032 |
| Pearls and slugs | | 1,000 | | 300 | | 1,300 | | 1,280 |
| Total | 1,013,000 | 55,520 | 300,000 | 17,000 | 1,313,000 | 72,520 | 2,921,100 | 66,747 |

| Gear and product | Lake Michigan—Continued | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Kalamazoo River, Mich. | | Muskegon River, Mich. | | Elkhart River, Ind. | | Pigeon River, Ind. | |
| | Pounds | Value | Pounds | Value | Pounds | Value | Pounds | Vaule |
| By crowfoot bars: | | | | | | | | |
| Mussel shells | 224,000 | $8,120 | | | 54,000 | $2,025 | 50,000 | $2,125 |
| Pearls and slugs | | 464 | | | | 112 | | 125 |
| By forks: | | | | | | | | |
| Mussel shells | 28,000 | 1,015 | | | | | | |
| Pearls and slugs | | 58 | | | | | | |
| By picks: | | | | | | | | |
| Mussel shells | 28,000 | 1,015 | 492,000 | $11,070 | 18,000 | 675 | 50,000 | 2,125 |
| Pearls and slugs | | 58 | | 1,330 | | 38 | | 125 |
| Total | 280,000 | 10,730 | 492,000 | 12,400 | 72,000 | 2,850 | 100,000 | 4,500 |

*Mussel-shell industry of the lake fisheries, 1930*—Continued

CATCH—Continued

| Gear and product | Lake Michigan—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Fox River, Wis. | | Grand River, Wis. | | Total, all rivers—Michigan | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| By crowfoot bars: | | | | | | |
| Mussel shells | 36,784 | $1,143 | 34,134 | $523 | 2,783,400 | $79,864 |
| Pearls and slugs | | 190 | | 87 | | 6,444 |
| By tongs: | | | | | | |
| Mussel shells | | | | | 16,000 | 328 |
| Pearls and slugs | | | | | | 35 |
| By forks: | | | | | | |
| Mussel shells | 18,391 | 571 | 17,066 | 261 | 306,200 | 6,759 |
| Pearls and slugs | | 95 | | 42 | | 698 |
| By picks: | | | | | | |
| Mussel shells | | | | | 1,600,500 | 47,619 |
| Pearls and slugs | | | | | | 3,668 |
| Total | 55,175 | 1,999 | 51,200 | 913 | 4,706,100 | 145,397 |

| Gear and product | Lake Michigan—Continued | | | | | |
|---|---|---|---|---|---|---|
| | Total, all rivers—Continued | | | | Grand total | |
| | Indiana | | Wisconsin | | | |
| | Pounds | Value | Pounds | Value | Pounds | Value |
| By crowfoot bars: | | | | | | |
| Mussel shells | 284,000 | $13,900 | 70,918 | $1,666 | 3,138,318 | $95,412 |
| Pearls and slugs | | 687 | | 277 | | 7,408 |
| By tongs: | | | | | | |
| Mussel shells | | | | | 16,000 | 328 |
| Pearls and slugs | | | | | | 35 |
| By forks: | | | | | | |
| Mussel shells | | | 35,457 | 832 | 341,657 | 7,591 |
| Pearls and slugs | | | | 137 | | 835 |
| By picks: | | | | | | |
| Mussel shells | 188,000 | 9,300 | | | 1,788,500 | 56,919 |
| Pearls and slugs | | 463 | | | | 4,131 |
| Total | 472,000 | 24,350 | 106,375 | 2,912 | 5,284,475 | 172,659 |

BUTTON BLANK MANUFACTURING

| Item | Number | Value |
|---|---|---|
| Establishments | 4 | |
| Persons engaged: | | |
| Proprietors | 4 | |
| Salaried employees | 1 | |
| Wage earners— | | |
| Average for season | 50 | |
| Average for year | 35 | |
| Paid to salaried employees | | $2,150 |
| Paid to wage earners | | 32,455 |
| Total salaries and wages | | 34,605 |
| Products—Button blanks, gross | 176,740 | 36,812 |
| By-products—Miscellaneous | | 424 |

## FISHERIES OF THE MISSISSIPPI RIVER AND TRIBUTARIES

*Catch of the fisheries of the Mississippi River and tributaries, 1922*

| Species | Pounds | Value |
|---|---|---|
| Black bass | 73,554 | $10,874 |
| Bowfin | 190,073 | 6,078 |
| Buffalofish | 17,267,177 | 1,013,692 |
| Carp | 18,338,371 | 872,128 |
| Catfish and bullheads | 8,092,690 | 713,461 |
| Crappie | 512,423 | 49,338 |
| Drum, fresh-water, or sheepshead | 5,260,892 | 290,480 |
| Eels | 16,060 | 1,057 |
| Mooneye | 3,450 | 166 |
| Paddlefish or spoonbill cat | 1,398,991 | 132,545 |
| Paddlefish caviar | 12,398 | 29,546 |
| Pike and pickerel | 20,100 | 1,850 |
| Pike perch (sauger) | 4,745 | 768 |
| Pike perch (wall-eyed) | 24,650 | 3,750 |
| Quillback or "American carp" | 765,389 | 59,221 |
| Rock bass | 2,738 | 312 |
| Sturgeon, lake | 10,953 | 1,369 |
| Sturgeon, shovelnose | 227,365 | 19,323 |
| Sturgeon, shovelnose, caviar | 1,880 | 2,615 |
| Sturgeon, shovelnose, eggs | 449 | 764 |
| Sucker "mullet" | 699,539 | 63,028 |
| Sunfish | 374,533 | 24,955 |
| White bass | 64,624 | 5,500 |
| Yellow bass | 7,500 | 600 |
| Yellow perch | 22,250 | 1,904 |
| Other fish | 73,275 | 4,917 |
| Shrimp | 147,482 | 14,570 |
| Crawfish | 7,890 | 759 |
| Frogs | 231,761 | 20,410 |
| Turtles | 96,743 | 2,772 |
| Alligator hides | 15,616 | 2,673 |
| Mussel shells | 51,768,173 | 1,050,592 |
| Pearls | | 46,124 |
| Slugs | | 55,380 |
| Total | 105,733,734 | 4,503,521 |

## FISHERIES OF ALASKA [13]

During 1931 the fisheries of Alaska employed 22,577 persons, of whom 8,914 were fishermen, 11,995 were engaged in the wholesale and manufacturing industries, and 1,668 in transporting fishery products. The catch in round weight amounted to 598,124,566 pounds, valued at $10,043,366, consisting of 467,664,391 pounds of salmon, valued at $7,757,966; 128,290,715 pounds of other fish, valued at $2,164,986; and 2,169,460 pounds of shellfish, valued at $120,414.

[13] With reference to the figures published in this section the reader should refer to that section in the latter part of the book entitled "Statistical survey procedure," which gives in detail methods for collecting statistics, compilation practices, and conversion factors. This is most necessary for a complete understanding of the statistics presented herewith.

*Fisheries of Alaska, 1931*

SUMMARY: BY DISTRICTS

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| PERSONS ENGAGED | | | | |
| In fishing ... number | 4,183 | 1,973 | 2,758 | 8,914 |
| In transporting ... do | 591 | 584 | 493 | 1,668 |
| In wholesale and manufacturing industries ... number | 4,599 | 3,396 | 4,000 | 11,995 |
| Total | 9,373 | 5,953 | 7,251 | 22,577 |
| CRAFT EMPLOYED | | | | |
| Vessels fishing ... number | 525 | 48 | 9 | 582 |
| Boats fishing ... do | 2,138 | 1,433 | 1,389 | 4,960 |
| Vessels transporting ... do | 172 | 140 | 87 | 399 |
| Scows, houseboats, pile drivers, etc ... do | 334 | 312 | 190 | 836 |
| Total | 3,169 | 1,933 | 1,675 | 6,777 |
| CATCH | | | | |
| Fish: | | | | |
| Salmon ... pounds | 204,452,280 | 137,905,111 | 125,307,000 | 467,664,391 |
| ... value | $2,879,412 | $2,219,945 | $2,658,609 | $7,757,966 |
| Other ... pounds | 104,835,823 | 17,390,925 | 6,063,967 | 128,290,715 |
| ... value | $1,924,822 | $187,840 | $52,324 | $2,164,986 |
| Shellfish ... pounds | 1,010,333 | 1,159,127 | ---------- | 2,169,460 |
| ... value | $49,629 | $70,785 | ---------- | $120,414 |
| Total ... pounds | 310,298,436 | 156,455,163 | 131,370,967 | 598,124,566 |
| ... value | $4,853,863 | $2,478,570 | $2,710,933 | $10,043,366 |
| WHOLESALE AND MANUFACTURING | | | | |
| Establishments ... number | 87 | 88 | 51 | 226 |
| PRODUCTS AS PREPARED FOR MARKET | | | | |
| Salmon ... pounds | 133,369,092 | 81,883,462 | 58,834,928 | 274,087,482 |
| ... value | $11,291,812 | $8,705,670 | $10,425,919 | $30,423,401 |
| Herring ... pounds | 36,673,926 | 7,624,417 | 3,853,225 | 48,151,568 |
| ... value | $747,673 | $254,863 | $225,360 | $1,227,896 |
| Halibut ... pounds | 19,018,986 | 1,277,247 | 129,400 | 20,425,633 |
| ... value | $1,277,860 | $66,154 | $8,673 | $1,352,687 |
| Cod ... pounds | ---------- | 324,898 | 90,000 | 414,898 |
| ... value | ---------- | $19,150 | $4,500 | $23,650 |
| Trout ... pounds | 60,194 | 27,336 | ---------- | 87,530 |
| ... value | $4,361 | $2,841 | ---------- | $7,202 |
| Sablefish ... pounds | 279,345 | ---------- | ---------- | 279,345 |
| ... value | $13,286 | ---------- | ---------- | $13,286 |
| Smelt ... pounds | ---------- | 1,340 | ---------- | 1,340 |
| ... value | ---------- | $80 | ---------- | $80 |
| Flounder ... pounds | 275,172 | ---------- | ---------- | 275,172 |
| ... value | $6,887 | ---------- | ---------- | $6,887 |
| Rockfish ... pounds | 22,919 | ---------- | ---------- | 22,919 |
| ... value | $677 | ---------- | ---------- | $677 |
| "Lingcod" ... pounds | 526 | ---------- | ---------- | 526 |
| ... value | $16 | ---------- | ---------- | $16 |
| Clam ... pounds | 30,789 | 523,527 | ---------- | 554,316 |
| ... value | $8,939 | $303,518 | ---------- | $312,457 |
| Shrimp ... pounds | 458,650 | 1,400 | ---------- | 460,050 |
| ... value | $184,197 | $250 | ---------- | $184,447 |
| Crab ... pounds | 60,311 | 60,612 | ---------- | 120,923 |
| ... value | $22,004 | $20,062 | ---------- | $42,066 |
| Total ... pounds | 190,249,910 | 91,724,239 | 62,907,553 | 344,881,702 |
| ... value | $13,557,712 | $9,372,588 | $10,664,452 | $33,594,752 |

OPERATING UNITS: BY DISTRICTS

| | | | | |
|---|---|---|---|---|
| Fishermen ... number | 4,183 | 1,973 | 2,758 | 8,914 |
| Vessels, fishing, motor ... do | 525 | 48 | 9 | 582 |
| Net tonnage ... do | 7,361 | 788 | 267 | 8,416 |
| Boats, fishing: | | | | |
| Motor ... do | 946 | 319 | 53 | 1,318 |
| Other ... do | 1,192 | 1,114 | 1,336 | 3,642 |

*Fisheries of Alaska, 1931*—Continued

OPERATING UNITS: BY DISTRICTS—Continued

| Item | | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|---|
| Apparatus: | | | | | |
| Traps | number | 274 | 202 | 2 | 478 |
| Purse seines | do | 325 | 138 | 5 | 468 |
| Yards | do | 114,710 | 29,996 | 2,146 | 146,852 |
| Haul seines | do | 3 | 137 | 3 | 143 |
| Yards | do | 600 | 31,268 | 410 | 32,278 |
| Gill nets | do | 315 | 1,828 | 2,453 | 4,596 |
| Yards | do | 36,520 | 165,196 | 326,534 | 528,250 |
| Beam trawls | do | 9 | 1 | | 10 |
| Wheels | do | | | 259 | 259 |
| Lines: | | | | | |
| Hand lines (cod fishery) | do | | 61 | 5 | 66 |
| Trawl lines (cod fishery) | do | | 36 | | 36 |
| Troll lines (salmon fishery) | do | 3,628 | | | 3,628 |
| Skates of lines (halibut fishery) | do | 3,838 | | | 3,838 |
| Crab pots | do | 320 | 130 | | 450 |
| Herring pounds | do | 2 | 12 | 1 | 15 |
| Herring-pound seines | do | 14 | 5 | 2 | 21 |

CATCH: BY DISTRICTS

[Estimated round weight and value to fishermen]

| | | | | | |
|---|---|---|---|---|---|
| FISH | | | | | |
| Salmon: | | | | | |
| Blueback, red, or sockeye | pounds | 12,761,595 | 40,116,195 | 109,173,687 | 162,051,477 |
| | value | $375,991 | $1,055,584 | $2,563,855 | $3,995,430 |
| Chinook or king | pounds | 9,203,900 | 2,153,320 | 2,248,200 | 13,605,420 |
| | value | $250,715 | $71,060 | $23,609 | $345,384 |
| Chum or keta | pounds | 25,656,714 | 19,798,830 | 13,875,336 | 59,330,880 |
| | value | $230,924 | $155,087 | $70,988 | $456,999 |
| Humpback or pink | pounds | 146,461,180 | 68,869,990 | 25 | 215,331,195 |
| | value | $1,809,304 | $809,899 | | $2,619,203 |
| Silver or coho | pounds | 10,368,891 | 6,966,776 | 9,752 | 17,345,419 |
| | value | $212,478 | $128,315 | $157 | $340,950 |
| Herring | pounds | 82,897,978 | 15,048,720 | 5,620,190 | 103,566,888 |
| | value | $621,735 | $112,865 | $42,151 | $776,751 |
| Halibut | pounds | 21,132,207 | 1,419,163 | 143,777 | 22,695,147 |
| | value | $1,277,860 | $66,154 | $8,673 | $1,352,687 |
| Cod | pounds | | 886,862 | 300,000 | 1,186,862 |
| | value | | $5,900 | $1,500 | $7,400 |
| Trout: | | | | | |
| Dolly Varden | pounds | 36,819 | 34,170 | | 70,989 |
| | value | $2,639 | $2,841 | | $5,480 |
| Steelhead | pounds | 39,536 | | | 39,536 |
| | value | $1,722 | | | $1,722 |
| Sablefish | pounds | 410,801 | | | 410,801 |
| | value | $13,286 | | | $13,286 |
| Smelt | pounds | | 2,010 | | 2,010 |
| | value | | $80 | | $80 |
| Flounders | pounds | 282,413 | | | 282,413 |
| | value | $6,887 | | | $6,887 |
| Rockfishes | pounds | 35,260 | | | 35,260 |
| | value | $677 | | | $677 |
| "Lingcod" | pounds | 809 | | | 809 |
| | value | $16 | | | $16 |
| Total | pounds | 309,288,103 | 155,296,036 | 131,370,967 | 595,955,106 |
| | value | $4,804,234 | $2,407,785 | $2,710,933 | $9,922,952 |
| SHELLFISH | | | | | |
| Crabs | pounds | 116,582 | 110,586 | | 227,168 |
| | value | $11,002 | $10,031 | | $21,033 |
| Shrimp | pounds | 832,563 | 1,727 | | 834,290 |
| | value | $36,839 | $50 | | $36,889 |
| Clams: | | | | | |
| Butter | pounds | 61,188 | | | 61,188 |
| | value | $1,788 | | | $1,788 |
| Razor | pounds | | 1,046,814 | | 1,046,814 |
| | value | | $60,704 | | $60,704 |
| Total | pounds | 1,010,333 | 1,159,127 | | 2,169,460 |
| | value | $49,629 | $70,785 | | $120,414 |
| Grand total | pounds | 310,298,436 | 156,455,163 | 131,370,967 | 598,124,566 |
| | value | $4,853,863 | $2,478,570 | $2,710,933 | $10,043,366 |

*Industries related to the fisheries of Alaska, 1931*

TRANSPORTING

| Item | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|
| Persons engaged ..... number | 591 | 584 | 493 | 1,668 |
| Vessels transporting: | | | | |
| Steam ..... do | | | 17 | 17 |
| Net tonnage ..... do | | | 30,560 | 30,560 |
| Motor ..... do | 172 | 140 | 70 | 382 |
| Net tonnage ..... do | 5,141 | 3,955 | 3,520 | 12,616 |
| Scows, houseboats, pile drivers, etc ..... do | 334 | 312 | 190 | 836 |

WHOLESALE AND MANUFACTURING

| | | | | |
|---|---|---|---|---|
| Persons engaged ..... number | 4,599 | 3,396 | 4,000 | 11,995 |
| Establishments: | | | | |
| Handling fresh and frozen fish ..... do | 39 | 7 | 1 | 47 |
| Curing fish ..... do | 31 | 29 | 26 | 86 |
| Canning fish ..... do | 42 | 55 | 25 | 122 |
| Manufacturing by-products ..... do | 7 | 8 | | 15 |
| Total, exclusive of duplication ..... do | 87 | 88 | 51 | 226 |

PRODUCTS AS PREPARED FOR MARKET

| | | | | | |
|---|---|---|---|---|---|
| **FRESH** | | | | | |
| Salmon (all species) | pounds | 768,619 | | | 768,619 |
| | value | $55,918 | | | $55,918 |
| Salmon eggs (for caviar) | pounds | | | 4,100 | 4,100 |
| | value | | | $500 | $500 |
| Herring (for bait) | pounds | 1,910,100 | 946,762 | 29,250 | 2,886,112 |
| | value | $26,763 | $12,469 | $351 | $39,583 |
| Halibut | pounds | 13,681,622 | 117,070 | 12,588 | 13,811,280 |
| | value | $942,135 | $8,948 | $496 | $951,579 |
| Trout | pounds | 34,552 | 21,400 | | 55,952 |
| | value | $3,011 | $2,422 | | $5,433 |
| Sablefish | pounds | 1,110 | | | 1,110 |
| | value | $30 | | | $30 |
| Smelt | pounds | | 1,340 | | 1,340 |
| | value | | $80 | | $80 |
| Flounders | pounds | 210,000 | | | 210,000 |
| | value | $5,250 | | | $5,250 |
| Rockfishes | pounds | 4,451 | | | 4,451 |
| | value | $134 | | | $134 |
| Crabs: | | | | | |
| Meat | pounds | 56,271 | 43,686 | | 99,957 |
| | value | $21,600 | $17,478 | | $39,078 |
| Whole in shell | pounds | 4,040 | 10,590 | | 14,630 |
| | value | $404 | $480 | | $884 |
| Clams, whole in shell | pounds | | 240 | | 240 |
| | value | | $50 | | $50 |
| Shrimp: | | | | | |
| Meat | pounds | 457,005 | 400 | | 457,405 |
| | value | $183,950 | $100 | | $184,050 |
| Whole in shell | pounds | 1,645 | 1,000 | | 2,645 |
| | value | $247 | $150 | | $397 |
| Total | pounds | 17,129,415 | 1,142,488 | 45,938 | 18,317,841 |
| | value | $1,239,442 | $42,177 | $1,347 | $1,282,966 |
| **FROZEN** | | | | | |
| Salmon (all species) | pounds | 5,969,299 | 22,800 | | 5,992,099 |
| | value | $392,018 | $644 | | $392,662 |
| Salmon fillets | pounds | 190,818 | | | 190,818 |
| | value | $19,153 | | | $19,153 |
| Herring (for bait) | pounds | 4,675,060 | 46,625 | | 4,721,685 |
| | value | $36,566 | $746 | | $37,312 |
| Herring (for food) | pounds | | | 236,500 | 236,500 |
| | value | | | $9,460 | $9,460 |
| Halibut | pounds | 5,284,947 | 1,157,737 | 116,812 | 6,559,496 |
| | value | $331,007 | $57,019 | $8,177 | $396,203 |
| Halibut fillets | pounds | 52,417 | | | 52,417 |
| | value | $4,718 | | | $4,718 |
| Halibut cheeks | pounds | | 2,032 | | 2,032 |
| | value | | $102 | | $102 |

*Industries related to the fisheries of Alaska, 1931*—Continued

PRODUCTS AS PREPARED FOR MARKET—Continued

| Item | | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|---|
| FROZEN—continued | | | | | |
| Trout | pounds | 21,786 | 5,936 | | 27,722 |
| | value | $738 | $419 | | $1,157 |
| Sablefish | pounds | 278,235 | | | 278,235 |
| | value | $13,256 | | | $13,256 |
| Flounders | pounds | 65,172 | | | 65,172 |
| | value | $1,637 | | | $1,637 |
| Rockfishes | pounds | 18,468 | | | 18,468 |
| | value | $543 | | | $543 |
| "Lingcod" | pounds | 526 | | | 526 |
| | value | $16 | | | $16 |
| Total | pounds | 16,556,728 | 1,235,130 | 353,312 | 18,145,170 |
| | value | $799,652 | $58,930 | $17,637 | $876,219 |
| CURED | | | | | |
| Salmon: | | | | | |
| Mild-cured | pounds | 3,243,200 | 16,800 | 60,800 | 3,320,800 |
| | value | $626,291 | $1,425 | $6,037 | $633,753 |
| Pickled | pounds | 77,800 | 354,450 | 708,950 | 1,141,200 |
| | value | $6,121 | $31,161 | $66,226 | $103,508 |
| Dried, smoked, and dry-salted | pounds | 7,600 | 9,450 | 1,265,126 | 1,282,176 |
| | value | $380 | $945 | $76,935 | $78,260 |
| Herring: | | | | | |
| Pickled (for food)— | | | | | |
| Scotch cure | pounds | 1,759,475 | 2,960,350 | 3,291,225 | 8,011,050 |
| | value | $107,097 | $167,217 | $199,493 | $473,807 |
| Norwegian cure | pounds | 200 | 29,500 | 130,800 | 160,500 |
| | value | $15 | $2,006 | $8,790 | $10,811 |
| Roused | pounds | | | 92,400 | 92,400 |
| | value | | | $4,266 | $4,266 |
| Spiced | pounds | 2,000 | | | 2,000 |
| | value | $250 | | | $250 |
| Dry-salted | pounds | | | 73,050 | 73,050 |
| | value | | | $3,000 | $3,000 |
| Cod: | | | | | |
| Dry-salted | pounds | | 58,800 | 90,000 | 148,800 |
| | value | | $2,702 | $4,500 | $7,202 |
| Stockfish | pounds | | 119,300 | | 119,300 |
| | value | | $11,930 | | $11,930 |
| Pickled | pounds | | 146,398 | | 146,398 |
| | value | | $4,471 | | $4,471 |
| Tongues | pounds | | 400 | | 400 |
| | value | | $47 | | $47 |
| Trout, pickled | pounds | 400 | | | 400 |
| | value | $36 | | | $36 |
| Total | pounds | 5,090,675 | 3,695,448 | 5,712,351 | 14,498,474 |
| | value | $740,190 | $221,904 | $369,247 | $1,331,341 |
| CANNED | | | | | |
| Salmon: | | | | | |
| Blueback, red or sockeye | pounds | 7,098,960 | 21,079,344 | 53,147,040 | 81,325,344 |
| | value | $1,471,578 | $4,116,919 | $9,997,591 | $15,586,088 |
| Chinook or king | pounds | 715,008 | 1,324,752 | 449,856 | 2,489,616 |
| | value | $134,825 | $276,690 | $75,872 | $487,387 |
| Chum or keta | pounds | 13,163,904 | 9,266,544 | 3,194,640 | 25,625,088 |
| | value | $891,375 | $607,108 | $202,202 | $1,700,685 |
| Humpback or pink | pounds | 96,645,216 | 45,140,064 | | 141,785,280 |
| | value | $7,052,803 | $3,162,695 | | $10,215,498 |
| Silver or coho | pounds | 4,245,840 | 3,903,888 | 4,416 | 8,154,144 |
| | value | $616,541 | $489,537 | $556 | $1,106,634 |
| Trout | pounds | 3,456 | | | 3,456 |
| | value | $576 | | | $576 |
| Miscellaneous fish | pounds | 5,328 | 5,640 | | 10,968 |
| | value | $999 | $1,035 | | $2,034 |
| Clams | pounds | 30,789 | 523,287 | | 554,076 |
| | value | $8,939 | $303,468 | | $312,407 |
| Crabs | pounds | | 6,336 | | 6,336 |
| | value | | $2,104 | | $2,104 |
| Total | pounds | 121,908,501 | 81,249,855 | 56,795,952 | 259,954,308 |
| | value | $10,177,636 | $8,959,556 | $10,276,221 | $29,413,413 |

*Industries related to the fisheries of Alaska, 1931*—Continued

PRODUCTS AS PREPARED FOR MARKET—Continued

| Item | | Southeast Alaska | Central Alaska | Western Alaska | Total |
|---|---|---|---|---|---|
| BY-PRODUCTS | | | | | |
| Fertilizer, salmon | pounds | 1,020,000 | 565,288 | | 1,585,288 |
| | value | $20,040 | $9,054 | | $29,094 |
| Meal, herring | pounds | 14,000,276 | 1,822,700 | | 15,822,976 |
| | value | $242,736 | $30,089 | | $272,825 |
| Oil: | | | | | |
| Salmon | pounds | 217,500 | 194,850 | | 412,350 |
| | value | $3,770 | $8,542 | | $12,312 |
| Herring | pounds | 14,326,815 | 1,818,480 | | 16,145,295 |
| | value | $334,246 | $42,336 | | $376,582 |
| Total | pounds | 29,564,591 | 4,401,318 | | 33,965,909 |
| | value | $600,792 | $90,021 | | $690,813 |
| Grand total | pounds | 190,249,910 | 91,724,239 | 62,907,553 | 344,881,702 |
| | value | $13,557,712 | $9,372,588 | $10,664,452 | $33,594,752 |

SUPPLEMENTARY TABLE SHOWING THE PACK OF CANNED PRODUCTS IN "STANDARD CASES" [1]

| | | | | | |
|---|---|---|---|---|---|
| Salmon: | | | | | |
| Blueback, red or sockeye | cases | 147,895 | 439,153 | 1,107,230 | 1,694,278 |
| | value | $1,471,578 | $4,116,919 | $9,997,591 | $15,586,088 |
| Chinook or king | cases | 14,896 | 27,599 | 9,372 | 51,867 |
| | value | $134,825 | $276,690 | $75,872 | $487,387 |
| Chum or keta | cases | 274,248 | 193,053 | 66,555 | 533,856 |
| | value | $891,375 | $607,108 | $202,202 | $1,700,685 |
| Humpback or pink | cases | 2,013,442 | 940,418 | | 2,953,860 |
| | value | $7,052,803 | $3,162,695 | | $10,215,498 |
| Silver or coho | cases | 88,455 | 81,331 | 92 | 169,878 |
| | value | $616,541 | $489,537 | $556 | $1,106,634 |
| Trout | cases | 72 | | | 72 |
| | value | $576 | | | $576 |
| Miscellaneous fish | cases | 111 | 118 | | 229 |
| | value | $999 | $1,035 | | $2,034 |
| Clams | cases | 2,039 | 34,886 | | 36,925 |
| | value | $8,939 | $303,468 | | $312,407 |
| Crabs | cases | | 132 | | 132 |
| | value | | $2,104 | | $2,104 |
| Total | cases | 2,541,158 | 1,716,690 | 1,183,249 | 5,441,097 |
| | value | $10,177,636 | $8,959,556 | $10,276,221 | $29,413,413 |

SUPPLEMENTARY TABLE SHOWING THE OUTPUT OF BY-PRODUCTS IN TONS AND GALLONS

| Item | | Southeast Alaska | Central Alaska | Total |
|---|---|---|---|---|
| Fertilizer, salmon | tons | 510 | 283 | 793 |
| | value | $20,040 | $9,054 | $29,094 |
| Meal, herring | tons | 7,000 | 911 | 7,911 |
| | value | $242,736 | $30,089 | $272,825 |
| Oil: | | | | |
| Salmon | gallons | 29,000 | 25,980 | 54,980 |
| | value | $3,770 | $8,542 | $12,312 |
| Herring | gallons | 1,910,242 | 242,464 | 2,152,706 |
| | value | $334,246 | $42,336 | $376,582 |
| Total | value | $600,792 | $90,021 | $690,813 |

[1] The pack of salmon, trout, miscellaneous fish, and crabs has been converted to "standard cases" of 48 one-pound cans, and clams to "standard cases" of 48 No. 1 five-ounce cans.

NOTE.—Halibut products include all taken by the Alaska fleet, some of which were landed at other than Alaskan ports. The total landings in Alaska in 1931 amounted to 9,626,118 pounds, valued at $608,480, as compared with 11,408,984 pounds, valued at $863,089, in 1930.

## FISHERIES OF PUERTO RICO

A general survey of the fisheries of Puerto Rico was made in 1899, immediately after the American occupation of that island, but no detailed data on catch, fishermen, and gear employed were secured. The survey made in 1931 was the first statistical and marketing survey made of the fisheries of Puerto Rico.

During 1930, the fisheries of Puerto Rico employed 1,403 fishermen. Their catch amounted to 3,080,100 pounds of fishery products valued at $207,085 to the fishermen. In making the catch the fishermen used 9 motor boats, 240 sailboats, and 462 rowboats. The gear employed consisted of 91 haul seines, 285 gill nets, 14 trammel nets, 366 cast nets, 31 dip nets, 9 hoop nets, 15 weirs (corrals), 912 hand lines, 133 trawl lines, 334 troll lines, and 4,239 fish pots.

As the fishermen keep no records of their operations, it was impossible to separate the catch by species. In general it may be stated that about 50 per cent of the catch is taken by fish pots, 30 per cent by nets, and 20 per cent by lines or other apparatus.

*Fisheries of Puerto Rico, 1930*

| | |
|---|---|
| Persons engaged, fishermen | 1,403 |
| Boats: | |
| Motor | 9 |
| Sail | 240 |
| Row | 462 |
| Apparatus: | |
| Haul seines | 91 |
| Length, yards | 19,820 |
| Gill nets | 285 |
| Square yards | 55,835 |
| Trammel nets | 14 |
| Square yards | 6,940 |
| Cast nets | 366 |
| Dip nets | 31 |
| Hoop nets | 9 |
| Fish pots | 4,239 |
| Weirs or corrals | 15 |
| Lines— | |
| Hand | 912 |
| Hooks | 2,501 |
| Trawl | 133 |
| Hooks | 18,087 |
| Troll | 334 |
| Hooks | 334 |
| Forks (used in taking langosta or spiny lobster) | 46 |
| Catch— | |
| Pounds | 3,080,100 |
| Value | $207,085 |

## COMMON AND SCIENTIFIC NAMES OF FISHERY PRODUCTS

In order to prevent misunderstanding from the use of common names employed in the tables and discussions, the following list of common and scientific names is given:

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*

| Common name as shown in bureau reports | Other common names | Scientific names |
|---|---|---|
| Albacore | Longfin tuna | *Germo alalunga.* |
| Alewives | Branch herring, wall-eyed or big-eyed herring. | *Pomolobus pseudoharengus.* |
| | Blueback, glut herring | *Pomolobus æstivalis.* |
| Amberjack | | Seriola species. |
| Anchovies | | *Engraulis mordax.* |
| | | *Anchoviella delicatissima.* |
| | | *Anchoviella compressa.* |
| Angelfish | | *Pomacanthus arcuatus.* |
| | | *Angelichthys isabelita.* |
| Barracuda | | *Sphyræna argentea* (Pacific coast). |
| | | *Sphyræna barracuda* (Atlantic coast). |
| Black bass | Smallmouth bass | *Micropterus dolomieu.* |
| | Largemouth bass | *Micropterus salmoides.* |
| Bluefish | Tailor | *Pomatomus saltatrix.* |
| Blue pike | Pike perch, blue pickerel (Canada) | *Stizostedion glaucum.* |
| Blue runner or hardtail | Runner | *Caranx crysos.* |
| Bonito | | *Sarda sarda.* |
| | | *Sarda chiliensis.* |
| Bowfin | | *Amia calva.* |
| Buffalofish | | Ictiobus species. |
| Bullhead | | Ameiurus species. |
| Butterfish | Dollarfish | *Poronotus triacanthus.* |
| Burbot | Lawyer, ling | *Lota maculosa.* |
| Cabio | Coalfish, crab eater, cobia | *Rachycentron canadum.* |
| Cabrilla | Rock bass | *Parala brax clathratus.* |
| Carp (German) | | *Cyprinus carpio.* |
| Catfish | | Siluridæ species. |
| Cero | | *Scomberomonus regalis.* |
| Chubs | Tullibee in Canada, longjaws, bluefin, blackfin in United States. | All Leucichthys except *artedi* (in Great Lakes). |
| Cigarfish | Scad | Decapterus species. |
| Cisco | Herring in Canada | *Leucichthys artedi* (Lake Erie only). |
| Cod | Codfish | *Gadus macrocephalus* (Pacific coast.) |
| | | *Gadus callarias* (Atlantic coast). |
| Cowfish | Trunkfish, chapin | Ostracion species. |
| Crappie | White crappie | *Pomoxis annularis.* |
| | Black crappie, strawberry bass, calico bass. | *Pomoxis sparoides.* |
| Crevalle | | *Caranx hippos.* |
| Croaker | Crocus, hardhead | *Micropogon undulatus.* |
| Cunner | Chogset, blue perch, bergall | *Tautogolabrus adspersus.* |
| Cusk | | *Brosmius brosme.* |
| Dolly Varden trout | Salmon trout, bull trout | *Salvelinus parkei.* |
| Dolphin | | *Coryphaena hippurus.* |
| Drum, fresh-water, or sheepshead. | White perch, gaspergou | *Aplodinotus grunniens.* |
| Drum, black | | *Pogonias cromis.* |
| Drum, red | Channel bass, redfish, spotted bass | *Sciænops ocellatus.* |
| Eels | | *Anguilla rostrata.* |
| | | *Leptocephalus conger.* |
| | | *Gymnothorax mordax.* |
| | | *Gymnothorax moringua.* |
| Eulachon | Candlefish | *Thaleichthys pacificus.* |
| Flounders | Dabs, blackbacks, lemon sole, winter flounder, summer flounder. | Pleuronectidae species. |
| Flyingfish | | *Cysilurus californicus.* |
| Frigate mackerel | | *Auxis thazard.* |
| Garfish | | Tylosurus species. |
| | | Ablennes species. |
| Gizzard shad | Nanny shad, mud shad | *Dorosoma cepedianum.* |
| Goldeye | | Hiodon species. |
| Goldfish | Sand perch | *Carassius auratus.* |
| Goosefish | | *Lophius piscatorius.* |
| Grayfish | Dogfish | *Squalus sucklii* (Pacific coast). |
| | Spiny dog | *Squalus acanthias.* |
| | Smooth dog | *Galeohinus lævis.* |
| Greenfish | Rudderfish | *Girella nigricans.* |
| Groupers | | Epinephelus species. |
| | | Mycteroperca species. |
| Grunts | Margatefish, sailors choice (Key West). | Hæmulon species. |
| Haddock | | *Melanogrammus aeglifinus.* |
| Hagfish | Slimefish | *Myxine glutinosa.* |
| Hake | Squirrel hake, Boston hake, ling, black hake, mud hake. | Urophycis species (Atlantic coast). |
| | Merluccio | *Merlucius productus* (Pacific coast). |
| Halfmoon | | *Medialuna californiensis.* |
| Halibut | | *Hippoglossus hippoglossus.* |
| Halibut, "California" | | *Paralichthys californicus.* |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in bureau reports | Other common names | Scientific names |
|---|---|---|
| Hardhead | | *Orthodon microlepidotus.* |
| Harvestfish | Starfish, pappyfish | *Peprilus alepidotus.* |
| Herring | | *Clupea harengus* (Atlantic coast). *Clupea pallasii* (Pacific coast). |
| Hickory shad | Tailor shad | *Pomolobus mediocris.* |
| Hog-choker | | *Achirus fasciatus.* |
| Hogfish | Capitaine, perro perro | *Lachnolaimus maximus* (Florida). |
| Horse mackerel | | *Trachurus symmetricus.* |
| Jewfish | | *Promicrops itaiara.* |
| Kingfish | | *Scomberomorus cavalla.* |
| Kingfish (California) | Little roncador, croaker | *Genyonemus lineatus.* |
| King whiting | Northern whiting, kingfish, seamink | Menticirrhus species. |
| Ladyfish | Bonefish, bananafish | *Albula vulpes.* |
| Lake herring | Herring | *Leucichthys artedi* (Great Lakes, except Erie). |
| Lake trout | | *Cristivomer namaycush.* |
| Launce | Sand eel, lant, sand launce | *Ammodytes americanus.* |
| "Lingcod" | Cultus cod, blue cod, buffalo cod, ling | *Ophiodon elongatus.* |
| Mackerel | | *Scomber scombrus* (Atlantic coast). *Scomber diego* (Pacific coast). |
| Menhaden | Mossbunker, pogy | *Brevoortia tyrannus.* |
| Minnows | | Cyprinidae species. |
| Mojarro | | Eucinostomus species. |
| Mooneye | Toothed herring | Hiodon species. |
| Moonfish | | *Vomer setipinnis. Selene vomer.* |
| Mullet | Jumping mullet | Mugil species. |
| Mummichog | Mayfish, killifish | Fundulus species. |
| Muttonfish | | *Lutianus analis.* |
| Paddlefish | Spoonbill cat | *Polyodon spathula.* |
| Parrotfish | | Scaridæ species. |
| Perch, white | White perch. Blue perch, surf-fishes | *Morone americana.* Embiotocidæ species (Pacific coast). |
| Perch, yellow | Winged perch | *Perca flavescens.* |
| Permit | Great pompano | *Trachinotus goodei.* |
| Pickerel | | *Esox reticulatus. Esox americanus.* |
| Pigfish | | *Orthopristis chrysopterus.* |
| Pike (jacks) | Great Lakes pike, pickerel | *Esox lucius.* |
| Pilchard | Sardine | *Sardinia cærulea.* |
| Pilotfish | | *Naucrates ductor. Seriole zonata.* |
| Pinfish | Bream, salt-water bream | *Lagodon rhomboides.* |
| Pollock | | *Pollachius virens.* |
| Pompano | | Trachinotus species (Atlantic coast). *Palometa simillimus* (Pacific coast). |
| Porgies | Porgee | Calamus species. |
| Porkfish | Sisi | *Anisotremus virginicus.* |
| Quillback | Spearfish or skimfish | Carpiodes species. |
| Roach | Shiner | *Notemigonus crysoleucas.* |
| Rock bass | Redeye, goggleeye | *Ambloplites rupestris* (Mississippi River and tributaries). |
| Rockfishes | Rock cod | Sebestodes species (Pacific coast). |
| Rosefish | | *Sebastes marinus.* |
| Sablefish | Black cod | *Anaplopoma fimbria.* |
| Salmon: | | |
| Atlantic | | *Salmo salar* (Atlantic coast). |
| Pacific— | | |
| Blueback, red or sockeye. | | *Oncorhynchus nerka.* |
| Chinook or king | Tyee, Columbia, Sacramento, spring | *Oncorhynchus tschawytscha.* |
| Chum or keta | Dog salmon | *Oncorhynchus keta.* |
| Humpback or pink. | | *Oncorhynchus gorbuscha.* |
| Silver or coho | | *Oncorhynchus kisutch.* |
| Steelhead | | (See steelhead trout.) |
| Sauger pike | Sand pike | *Stizostedion canadense.* |
| Sawfish | | *Pristis pectinatus.* |
| Scamp | | *Mycteroperca phenax.* |
| Sculpin | | Cottidæ species. |
| Scup | Paugy or porgy, fair maid | *Stenotomus chrysops.* |
| Sea bass | Black jewfish or black sea bass. Black sea bass | *Stereolepis gigas* (Pacific coast.) *Centropristes striatus* (Atlantic coast). |
| Sea bass, white (California) | | *Cynoscion nobilis* (Pacific coast). |
| Sea gar | Needlefish, billfish, houndfish | Tylosurus species. |
| Sea robin | | Prionotus species. |
| Shad | American shad | *Alosa sapidissima.* |
| Sharks | | Carcharodon species; Mustelus species; Carcharhinus species; Sphyrna species. |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in bureau reports | Other common names | Scientific names |
|---|---|---|
| Sheepshead (salt-water) | | *Archosargus probatocephalus.* |
| Sheepshead (fresh-water) | Drum, fresh-water | *Aplodinotus grunniens.* |
| Sheepshead (Pacific coast) | Redfish, flat head | *Pimelometopon pulcher.* |
| Silversides | Spearing | Menidia species. |
| Silver perch | Sand perch | *Bairdiella chrysura.* |
| Skates | | Raja species. |
| Skipjack | Striped tuna | *Euthynnus pelamys.* |
| Skipper | "Billfish" | *Scomberesox saurus.* |
| Smelt | | *Osmerus mordax* (Atlantic coast).<br>Argentinidæ species (Pacific coast). |
| Snapper, Mangrove | Gray snapper | *Lutianus griseus.* |
| Snapper, red | | *Lutianus blackfordii.* |
| Snook | Robalo, sergeantfish | *Centropomus undecimalis.* |
| Sole | | *Psettichthys melanostictus* (Pacific coast). |
| Spadefish | | *Chaetodipterus faber.* |
| Spanish mackeral | | *Scomberomorus maculatus.* |
| Spearfish | | *Tetrapturus imperator.* |
| Splittail | | *Pogonichthys macrolepidotus.* |
| Spot | Lafayette, goody | *Leiostomus xanthurus.* |
| Squawfish | Sacramento pike | *Ptychocheilus oregonensis.* |
| Squeteague (gray) | Gray trout, weakfish, trout | *Cynoscion regalis.* |
| Squeteague (spotted) | Spotted weakfish, spotted trout | *Cynoscion nebulosus.* |
| Squirrelfish | | *Diplectrum formosum.* |
| Steelhead trout | Salmon trout | *Salmo gairdneri.* |
| Stingray | | Dasyatis species. |
| Striped bass | Rockfish, rock | *Roccus lineatus.* |
| Sturgeon | | Acipenser species. |
| Sturgeon, shovelnose | | *Scaphirrhynchus platorynchus.* |
| Sucker | Fresh-water mullet | Catostomidæ species. |
| Sunfish | | Lepomis species.<br>Centrarchidæ species. |
| Surf fishes | | Embiotocidæ species. |
| Swellfish | Puffer, swell toad, balloonfish, globefish. | *Spheroides maculatus.* |
| Swordfish | | *Xiphias gladius.* |
| Tang | | Hepatus species. |
| Tarpon | Silver king | *Tarpon atlanticus.* |
| Tautog | Blackfish, oysterfish | *Tautoga onitis.* |
| Tenpounder | Elops | *Elops saurus.* |
| Thimble-eyed mackerel | Bullseye | *Scomber colias.* |
| Tilefish | | *Lopholatilus chamæleonticeps.* |
| Tomcod | | *Microgadus tomcod* (Atlantic coast).<br>*Microgadus proximus* (Pacific coast). |
| Tripletail | | *Lobotes surinamensis.* |
| Tuna | Bluefin tuna, tunny, horse mackerel, leaping tuna. | *Thunnus thynnus.* |
| Turbot | Greenland halibut, American turbot | *Reinharditus hippoglossoides.*<br>*Balistes carolinensis.* |
| White bass | White lake bass | *Roccus chrysops.* |
| Whitebait | | Small fry of any fish. |
| Whitefish | | *Coregonus clupeiformis* (Great Lakes).<br>*Caulolatilus princeps* (Pacific coast). |
| Whitefish (Menominee) | | *Coregonus clupeaformis.* |
| Whiting | Silver hake | *Merluccius bilinearis.* |
| Wolffish | | *Anarrhichas lupus.* |
| Yellow bass | | *Morone interrupta.* |
| Yellow perch | | *Perca flavescens.* |
| Yellow pike | Wall-eyed pike, pike perch, dore | *Stizostedion vitreum.* |
| Yellowfin tuna | | *Neothunnus macropterus.* |
| Yellowtail | | *Ocyurus chrysurus* (Atlantic coast).<br>*Seriola dorsalis* (Pacific coast). |
| Wahoo | | Acanthocybium solandri. |
| Abalone | | Halotis species. |
| Clams: | | |
| Hard | Round clam, cherrystone, quahog, little neck. | *Tivela stultorum* (Pacific coast).<br>*Venus mercenaria* (Atlantic coast).<br>*Venus mortoni* (Florida coast). |
| Cockle | | *Cardium corbis.* |
| Soft | Sand clam, soft-shelled clam, nannynose, maninose. | *Mya arenaria.* |
| Surf | Skimmer | *Mactra solidissima.* |
| Razor (Atlantic) | | Siliqua species; Tagelus species. |
| Razor (Pacific) | | *Siliqua patula.* |
| Pismo | | *Tivela stultorum* (Pacific coast). |
| Conchs | | Strombus species.<br>Busycon species. |

*Common and scientific names of the commercial fishery products caught in the United States and Alaska*—Continued

| Common name as shown in bureau reports | Other common names | Scientific names |
|---|---|---|
| Crabs: | | |
| Stone | | *Menippi mercenaria.* |
| Soft | Soft-shelled crab, blue crab | *Callinectes sapidus.* |
| Hard | Hardshell crab, blue crab | Do. |
| | Dungeness crab | *Cancer magister* (Pacific coast). |
| | Rock crab, hard crab | *Cancer irroratus* (Atlantic coast). |
| King | Horseshoe crab | Limulus. |
| Spider | Toad crab | *Hyas coarctatus.* |
| Crawfish | Crayfish | Cambarus species (Atlantic coast). Astacus species (Pacific coast). |
| Lobsters: | | |
| Common | | *Homarus americanus* (Atlantic coast). |
| Spiny | Rock lobster, crayfish | *Panulirus interruptus* (Pacific coast). *Panulirus argus* (Atlantic coast). |
| Mussels: | | |
| Sea | | *Mytilus californianus* (Pacific coast). *Mytilus edulis.* |
| Freshwater | | Quadrula species. Lampsilis species. Symphynota species. Unio species. |
| Octopus | | *Octopus punctatus* (Pacific coast). |
| Oysters: | | |
| Eastern | | *Ostrea elongata.* |
| Western | Olympia | *Ostrea lurida* (Pacific coast). |
| Japanese (introduced) | | *Ostrea gigas.* |
| Periwinkles | | Littorina species. |
| Scallops: | | |
| Sea | | *Pecten magellanicus.* |
| Bay | | *Pecten irradians* (Atlantic coast). *Pecten æquisulcatus* (Pacific coast). |
| Shrimp | | *Peneus setiferus.* *Peneus brasiliensis* (Atlantic and Gulf coasts). Pandalus species (Pacific coast). Pandalopsis species (Pacific coast). Crangon species (Pacific coast). |
| Snails | | Gastropoda species. |
| Squid | | *Loligo opalescens* (Pacific coast). *Loligo pealei* (Atlantic coast). |
| Turtles: | | |
| Green | | Chelonia mydas. |
| Loggerhead | | *Thalassocheiys caretta.* |
| Hawksbill | | *Chelonia inbricata.* |
| Snapping | Mud turtle, mossback | *Chelydra serpentina.* |
| Terrapin | Diamond-back terrapin | *Malacoclemmys palustris.* |
| Frogs | | Rana species. |
| Irish moss | | *Chondrus crispus.* |
| Kelp | | Macrocystis species; Nereocystis species; Pelagophycus species; Alaria species. |
| Sponges: | | |
| Glove | | *Spongia graminea* (Hyatt) *Euspongia officianalis* (L.). |
| Grass | | *Hippospongia equina cerebriformis.* |
| Sheepswool | | *Hippospongia canaliculata gossypina.* |
| Yellow | | *Hippospongia equina elastica.* |
| Trepang | Sea cucumber | *Cucumaris frondosa; Thyone briareus.* |

## STATISTICAL SURVEY PROCEDURE

### METHODS OF COLLECTION

In order that persons using the statistics in this report may judge as to their completeness and authenticity, there follows an outline of the methods employed by the bureau in collecting fishery statistics. It will be noted that several methods are used. Each method has been carefully studied to obtain the best results with the available personnel.

*General fishery statistics.*—In the collection of general fishery statistics, data are obtained on the catch of fishery products and its value

as landed by the fishermen, the quantity or number of each kind of gear used, the number of fishing boats, the number and net tonnage of fishing and transporting vessels, the number of wholesale establishments, the amount of wages and salaries paid in these establishments, the quantity and value of products prepared, and the number of persons engaged in each phase of the industry.

The scope of the coastal surveys includes the commercial fisheries of the oceans, bays, and coastal rivers as far inland as commercial fishing is important. This usually coincides with the range of commercial fishing for anadromous species. Statistics of the fisheries of the Mississippi River include the fisheries of the Mississippi River proper, as well as all tributaries wherein commerical fishing for either fish, crustaceans, or mollusks is prosecuted. Statistics of the lake fisheries include those prosecuted in the Great Lakes, adjacent bays, and the international lakes of northern Minnesota, as well as certain rivers having outlets into these waters.

Beginning in 1929 general fishery statistics have been collected on an annual basis for all of the marine and lake sections of the United States and Alaska.

In conducting these surveys it is the custom of the bureau to dispatch agents to the districts to be surveyed early in the calendar year. (It should be noted that statistics on the catch of oysters for 1930 cover the calendar year. In previous years statistics for this mollusk were for the oyster season.) They obtain statistics on operations during the previous calendar year. The agents conducting these surveys are trained men or recruits working under the close supervision of trained men. Recruits are permitted to work individually only after proving a satisfactory aptitude for the work during their training period. While it is impossible for the few agents available to interview each fisherman in a given locality, the more important ones are visited and a sufficient number of those of lesser importance are interviewed to obtain reliable information on their production. In practice, virtually all wholesale firms are visited, as well as captains of fishing vessels (those of 5 net tons or over) and also all the more important shore fishermen and representative small producers.

As an aid in locating fishermen, lists of vessels and motor-boat owners are obtained from local customhouses. It is also often possible to obtain the names of licensed commercial fishermen and occasionally some statistics of the catch from the various State fishery agencies. In the Great Lakes and Pacific Coast States such exceptional cooperation has been obtained from the State agencies in recent years that only fragmentary surveys are made by the bureau to supplement missing data. Virginia and Maryland have recently adopted very complete statistical plans.

For the Great Lakes and international lakes of northern Minnesota the bureau obtains catch statistics and usually the value of the catch direct from the State records. To obtain data on the fishermen, boats, vessels, and gear the bureau conducts such personal surveys among the fishermen as may be necessary to supplement the State records. Annual catch statistics are available since 1913.

Agents are stationed at Seattle, Wash., who survey each of the Pacific Coast States annually to supplement data that are missing from the State records. In most cases the value of the catch is derived from dealers' records and from estimates of prices. In

Washington and Oregon the offshore fisheries are surveyed separately for units of operation, catch, and value of the catch. In almost all other respects the statistics are as collected by the States. Statistics of the wholesale industry for this section are obtained largely by personal interview.

The fisheries of Alaska are conducted primarily by large operators. Sworn statements are required from these operators concerning their operations. These are collected and compiled by the Alaska division of this bureau.

Statistics on the catch of fish collected in the above general canvasses are shown in this report on the basis of round weight, that is, the weight of the fish as caught, except in the Pacific Coast States where "as landed" weights are shown.

In general in the Pacific Coast States halibut is landed heads on but eviscerated; tuna and tunalike fishes are landed headless and eviscerated; swordfish may be landed headless and eviscerated; some salmon, especially that caught by troll lines, may be eviscerated; "lingcod," rockfishes, and sablefish may be landed eviscerated. The weight of cod caught off Alaska and shown in the Pacific coast tables has been converted to the basis of round weight.

Bulletins containing statistics for each section are released following the survey.

*Landings at certain important United States ports.*—Statistics of the landings at the principal New England ports, Boston and Gloucester, Mass., and Portland, Me., are similarly obtained. An agent is permanently stationed at each of these ports. His duties include the obtaining of statistics on the quantity of fish landed each day by each fishing vessel, the value of such fish landed, information concerning the date of departure and arrival of the vessel, and also a list of the grounds from which the fish were taken and the gear used in their capture. These statistics are forwarded to the bureau, where compilations are made. Monthly statistical bulletins are issued for these landings as well as annual bulletins summarizing the year's activities.

Statistics of the landings of fish at Seattle, Wash., are collected by the bureau's agent in that city. Landings are classified as those made by American fishing vessels and those received by Seattle wholesale dealers. The landings credited to United States fishing vessels are made by vessels operating distinctly as primary fishing units, usually in the offshore fisheries, while those credited as received by wholesale dealers are usually products of the shore fisheries collected mainly from points in Puget Sound and do not include fish received from Alaska or Canada, or landings made by the halibut fleet. Monthly statistical bulletins are issued for these landings as well as annual bulletins summarizing the year's activities.

Statistics on the landings of fish at New York City are obtained by J. H. Matthews, executive secretary of the Middle Atlantic Fisheries Association, while those for Groton, Conn., are obtained by the bureau's agents. Statements of these landings are forwarded to the bureau, where they are compiled. These statistics have not included the value of the catch. Monthly bulletins including these data are not issued; however, a summary is published in this document.

Statistics of the fishery products handled at the municipal wharf, Washington, D. C., are reported to the bureau by agents of the city health department. They are not published in bulletin form, but a summary of the year's activities is published in the annual report of this division.

*Atlantic mackerel fishery.*—Statistics on the catch by the Atlantic mackerel fleet are obtained by combining the figures of mackerel landed at Boston and Gloucester, Mass., and Portland, Me., with those obtained by agents who in recent years have been stationed at other Atlantic ports where mackerel are landed. These agents obtain data on the fares of mackerel landed, similar to the data obtained on the landings by fishing vessels at the three New England ports. The figures include only the catches made by purse seine and drift gill net craft and are not complete for these gears for craft under 5 net tons, capacity. Statistics of this fishery appear only in the annual reports of this division, although the landings at the principal New England ports appear in the monthly and annual bulletins published for those ports.

*Shad and alewife fisheries.*—Due to the importance of the Hudson and Potomac Rivers in the production of shad, surveys for the statistics of the catch, value of the catch, and operating units are made annually. On the Potomac River similar statistics also are obtained for the alewife fishery. The surveys are conducted by agents in a manner similar to that employed in the collection of general fishery statistics, except that probably more fishermen are interviewed, as great care is exercised to make these canvasses as accurate as possible.

The State of New York obtains statistics for the fisheries of the Hudson River that closely parallel those desired by the bureau for this fishery, which alleviates the work on this river.

Statistics of the shad and alewife fisheries are not published separately in bulletin form, but a summary of the year's activities is published in the annual report of this division.

*Sponge market, Tarpon Springs.*—A large proportion of the total output of sponges in Florida is handled through the sponge exchange at Tarpon Springs. In view of this, the bureau has arranged with a representative of the exchange to furnish statistics of the quantity and value of the sponges, by variety classification, handled through it annually. Statistics of the quantity of sponges handled through the exchange are not published in bulletin form, but a summary of the year's activities is published in the annual reports of this division.

*Pacific halibut fishery.*—Statistics of the Pacific halibut fishery are obtained by the bureau's agent in Seattle, aided by bureau representatives in Alaska, American consuls in British Columbia, the International Fisheries Commission, and the Prince Rupert Halibut Exchange. The fleet classification has been arbitrarily applied by including in the "Washington fleet" all United States and Alaska vessels that land more than half of their catch in that State. All other United States and Alaska vessels of the halibut fleet are included in the "Alaska fleet." Monthly and annual statistical bulletins are available on this fishery, being published along with the statistics of the landings of fishery products at Seattle, Wash.

*Canned fishery products and by-products.*—Beginning in 1921, the bureau has made annual surveys for statistics of the canned fishery products and by-products industries. These are begun the first

week in January of each year for statistics of the production in the preceding year. The surveys usually occupy six to nine weeks' time. During this period agents visit each plant in the United States where there is a production of canned fishery products or by-products. They obtain statistics of the production and value of the production for each commodity. In rare instances, where plants are not easily reached by regular transportation facilities, returns are obtained by mail.

The value shown for canned products constitutes the gross amount received by the packer at the production point, no deductions being made for commissions or expenses.

Statistics of the canned fishery products and by-products produced in Alaska are received on the same sworn statements that include statistics of the general fisheries. An annual statistical bulletin is issued on this trade.

*Manufactured fishery products.*—Statistics were obtained for 1930 for the first time on the total production of the many fishery products manufactured in the marine and lakes sections of the United States. These data appear only in the annual report of this division.

*Packaged-fish trade.*—Complete statistics of the annual production and value of fish packaged in the United States are obtained as a part of the survey for statistics of the canned fishery products and by-products industries. These statistics are published in bulletin form annually.

*Cold-storage holdings of fish.*—An arrangement has been made with the Bureau of Agricultural Economics, Department of Agriculture, whereby statistics of the cold-storage holdings of the various species of fish, by sections of the United States, are furnished to this bureau monthly. Included with statistics of the holdings is a statement of the quantity of the various species of fish frozen and also the holdings of certain cured fish. Bulletins showing these statistics are issued monthly as well as annually.

*Foreign fishery trade.*—Statistics on the foreign fishery trade are obtained from compilations made by the Bureau of Foreign and Domestic Commerce. Statistics of all known fishery products imported or exported are assembled in one table and published annually in the report of this division.

## COMPILATION PRACTICES

Certain practices of importance used in the compilation of fishery statistics are explained below.

*Days absent.*—In computing "days absent" for vessels landing fares at the various ports, the day of departure and the day of arrival are included; thus, a vessel leaving port on the 8th of the month and returning on the 15th of the month will be shown as being absent eight days.

*Operating units.*—Operating units as referred to in this document include persons engaged and fishing craft and gear employed.

*Vessels.*—The term "vessels" refers to craft having a capacity of 5 net tons or greater.

*Incidental catch.*—The term "incidental catch" refers to the catch of certain species by a type of gear which ordinarily does not take appreciable amounts, if any, of such species.

*Percentages.*—Percentages are usually shown as whole numbers. Fractions of per cents are dropped if less than five-tenths, and the percentage is raised to the next higher integer if the fraction is greater than five-tenths. If the fraction is exactly five-tenths, the integer is raised or lowered to make it an even number.

*Converting.*—Many of the figures shown in the statistical tables published herewith have been reduced to thousands of pounds or dollars. In making these conversions the largest number from which a group of items is computed is raised or lowered to the nearest thousands place. If the number ends in an even 500, the thousands integer is raised or lowered to make it an even number. The individual items are changed to conform to the total thus obtained.

## CONVERSION FACTORS

It is the policy of the bureau to show the detailed catch figures of all products in pounds for the sake of uniformity and for purposes of comparison. Following such a policy presents very definite problems. In the case of fish there is little difficulty since in very rare instances are such products reported in units of measure other than pounds. For shellfish, however, the units of measure may be bushels, sacks, barrels, or thousands of shellfish, gallons of meats, etc. These many units make standardization difficult, but when coupled with the wide variation in the requirements or definition of some of these units in the various States the problem becomes even more complex.

All bivalve mollusks are reported in pounds of meats in the detailed catch tables presented in this report. In addition there is presented a supplementary table for each section on the production in bushels. These supplementary tables also give the production of certain other shellfish, such as crabs, in number.

*Oysters.*—Probably the greatest problem in presentation of fishery statistics in uniform units of measure is in the case of oysters. Usually the production of oysters on the Atlantic and Gulf coasts is reported to bureau agents in bushels and prior to the data shown in this report conversion from bushels to pounds of meats was effected on the basis of a uniform yield of 7 pounds of meat to the bushel. There follows a table which gives the results of a recent study of the measures used for oysters in the various States and of the average yields per bushel. This table presents the new factors that have been used in the oyster statistics given in this report. These figures apply to the year 1930 and are based on the records of oyster canneries and shucking houses. It is probable that in subsequent years there will be variations from these figures.

*Measures and yields of oysters*

| State | Capacity of State bushel | Variation from United States standard bushel | | Market oysters | | Seed oysters | |
|---|---|---|---|---|---|---|---|
| | | Cubic inches | Per cent | Yield per State bushel | Yield per standard bushel | Yield per State bushel | Yield per standard bushel |
| | Cubic inches | | | Pounds of meat | Pounds of meat | Pounds of meat | Pounds of meat |
| Massachusetts | 2,150.4 | | | 8.8 | 8.8 | 7.0 | 7.0 |
| Rhode Island | 2,150.4 | | | 8.0 | 8.0 | 7.0 | 7.0 |
| Connecticut | 2,150.4 | | | 7.5 | 7.5 | 7.0 | 7.0 |
| New York | 2,150.4 | | | 7.0 | 7.0 | 7.0 | 7.0 |
| New Jersey | 2,257.3 | +126.9 | +5.0 | 8.41 | 7.96 | 4.5 | 4.26 |
| Delaware | 2,257.3 | +126.9 | +5.0 | 7.5 | 7.1 | 4.5 | 4.26 |
| Maryland | 2,801.5 | +650.1 | +30.2 | 7.413 | 5.69 | 5.0 | 3.84 |
| Virginia | 3,003.4 | +853.0 | +39.7 | 6.86 | 4.91 | 5.0 | 3.58 |
| North Carolina | 2,801.9 | +651.5 | +30.3 | 5.36 | 4.11 | | |
| South Carolina | 4,071.5 | +1,921.1 | +89.3 | 4.61 | 2.44 | | |
| Georgia | 2,753.4 | +603.0 | +28.0 | 4.41 | 3.44 | | |
| Florida | 3,214.1 | +1,063.7 | +49.4 | 3.34 | 2.23 | | |
| Alabama | 2,826.2 | +675.8 | +31.4 | 3.23 | 2.46 | | |
| Mississippi | 2,826.2 | +675.8 | +31.4 | 1.91 | 1.45 | | |
| Louisiana | 2,148.4 | −2.0 | −0.1 | 3.99 | 3.99 | | |
| Texas | 2,700.0 | +549.6 | +25.6 | 4.65 | 3.70 | | |

*Other mollusks.*—Whereas in previous reports certain other mollusks have been converted from bushels to pounds of meats on the basis of an average yield for the whole country, a more detailed study established the factors for the various States for 1930 which are shown in the following table.

*Average yields of certain mollusks in pounds of meats per bushel*

| State | Clams, hard | | Clams, soft | | Clams, surf | Cockles | Mussels, sea | Periwinkles | Scallops, sea and bay |
|---|---|---|---|---|---|---|---|---|---|
| | Public | Private | Public | Private | | | | | |
| Maine | | | 17 | 17 | | 10 | | | |
| Massachusetts | 11 | 11 | 17 | | 12 | 18 | 10 | 18 | 6 |
| Rhode Island | 11 | 11 | 17 | | | | | 18 | 6 |
| Connecticut | 8 | | 15 | | | | | | 6 |
| New York | 9 | 10 | 15 | 15 | 12 | | 10 | | 6 |
| New Jersey | 8 | 10 | 12 | 12 | 12 | | 10 | | 6 |
| Delaware | 8 | 8 | | | | | 10 | | |
| Maryland | 8 | | | | | | | | |
| Virginia | 8 | | | | | | | | 6 |
| North Carolina | 10 | | | | | | | | |
| South Carolina | 10 | | | | | | | | |
| Georgia | 10 | | | | | | | | |
| Florida | 8 | 8 | | | | | | | 6 |

*Other conversion factors.*—The principal other conversion factors that have been used in this report are as follows:

Alewives — To convert number of fish to weight in pounds, multiply by 0.4.

Cod, large, salted — To convert to fresh-gutted weight, multiply by 1.90.

Cod, market, salted — To convert to fresh-gutted weight, multiply by 1.94.

Cod, scrod, salted — To convert to fresh-gutted weight, multiply by 1.98.

Cod, all sizes, fresh-gutted — To convert to round weight, multiply by 1.25.

| | |
|---|---|
| Crustaceans: | |
| Crabs, soft (all States) | To convert number of crabs to weight in pounds, divide by 3. |
| Crabs, hard (Florida) | To convert number of crabs to weight in pounds, divide by 1.86. |
| Crabs, hard (Alabama) | To convert number of crabs to weight in pounds, divide by 1.715. |
| Crabs, hard (Mississippi) | To convert number of crabs to weight in pounds, divide by 1.715. |
| Crabs, hard (Louisiana) | To convert number of crabs to weight in pounds, divide by 1.86. |
| Crabs, hard (Texas) | To convert number of crabs to weight in pounds, divide by 1.715. |
| Crabs, hard (other States) | To convert number of crabs to weight in pounds, divide by 3. |
| Crabs, king | To convert number of crabs to weight in pounds, multiply by 4. |
| Crabs, rock | To convert number of crabs to weight in pounds, divide by 3. |
| Cusk, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Haddock, large, salted | To convert to fresh-gutted weight, multiply by 2.06. |
| Haddock, scrod, salted | To convert to fresh-gutted weight, multiply by 2.10. |
| Haddock, fresh-gutted, all sizes | To convert to round weight, multiply by 1.25. |
| Hake, large, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Hake, small, salted | To convert to fresh-gutted weight, multiply by 1.98. |
| Halibut, salted | To convert to fresh-gutted weight, multiply by 2. |
| Herring, salted | To convert to round weight, multiply by 1.50. |
| Mackerel, salted | To convert to round weight, multiply by 1.35. |
| Menhaden | To convert number of fish to weight in pounds, multiply by 0.6. |
| Oil (east coast) | To convert gallons to pounds, multiply by 7.74. |
| Oil (west coast) | To convert gallons to pounds, multiply by 7.5. |
| Pollock, salted | To convert to fresh-gutted weight, multiply by 1.90. |
| Sponges, dried (Florida): | |
| Large wool | To convert number of bunches of sponges to weight in pounds, multiply by 2.5. |
| Small wool | To convert number of bunches of sponges to weight in pounds, multiply by 1. |
| Glove | To convert number of bunches of sponges to weight in pounds, multiply by 1.5. |
| Grass | To convert number of bunches of sponges to weight in pounds, multiply by 2.5. |
| Wire | To convert number of bunches of sponges to weight in pounds, multiply by 1.5. |
| Yellow | To convert number of bunches of sponges to weight in pounds, multiply by 1.5. |

O

# PROGRESS IN BIOLOGICAL INQUIRIES, 1931 [1]

By ELMER HIGGINS, *Chief, Division of Scientific Inquiry*

[With the collaboration of investigators]

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[1] Appendix III to the Report of the U. S. Commissioner of Fisheries for 1932. Approved for publication, June 16, 1932.

## INTRODUCTION

Fisheries biological research by the bureau's division of inquiry respecting food fishes was conducted during the year 1931 under ideal conditions. Not only were funds provided in adequate measure to meet the ordinary needs of the existing organization, but the effects of the economic depression had not yet seriously interfered with the law of supply and demand regulating fishing activities, nor during the early part of the year had it greatly increased the strain upon the fishes of interior waters. Under such circumstances a large staff, functioning with high efficiency, succeeded in collecting great numbers of field observations, which by the end of the year were rapidly being analyzed as a basis for a number of technical reports. All of the major projects under way during 1930 were continued, many of the minor ones were completed, and two entirely new projects of considerable importance were undertaken.

The chief functions of the Bureau of Fisheries are concerned with the conservation of our aquatic resources, yet its operations are different from those of other similar governmental units. Virtually all of the State governments maintain fishery boards, fish and game departments, or conservation commissions, all of which give direct attention to the problems of conservation through regulation of the fisheries by rule or by the enforcement of laws enacted by the State legislatures. Their functions are chiefly administrative, although a few States engage in research as a basis for their regulatory activities. Foreign Governments likewise maintain fishery departments that correspond to our State commissions in their regulatory and administrative functions.

Federal activities in fishery conservation in the United States, however, are of the positive kind, looking toward the development and complete utilization of aquatic resources by means of scientific research and practical fish culture, rather than by negative or restrictive activities such as are involved in the enforcement of regulatory legislation. Except in the Territory of Alaska, the Bureau of Fisheries is without power to regulate fishing, for under the Federal form of government Congress enjoys only such powers as are delegated by the Constitution, and complete jurisdiction of the fisheries has remained in the hands of the individual States. The Bureau of Fisheries is, therefore, essentially a scientific organization; and its findings, presented to the States in the form of technical reports and direct recommendations, become effective only by enactment of the State legislatures. Such recommendations, however, based upon adequate scientific studies and coming from a disinterested and impartial source, are cordially accepted by the States and have great influence in shaping conservation policies insuring the perpetuation of our aquatic resources.

Research activities in the biological sciences are conducted by the technical staff of the division, numbering some 50 permanent research positions, with a score of less trained assistants and perhaps another score of temporary specialists, chiefly from university faculties, who are employed for limited periods of time. These investigators are distributed over the entire country in small groups organized into compact research units, which maintain headquarters either at the

bureau's biological or experimental stations or at universities. Only a small administrative staff in the office of the chief of the division is located at Washington, D. C. A half dozen or so investigators whose duties require their location there are accommodated in the new laboratories of the Department of Commerce building.

The scientific projects cover three major fields: Marine and fresh-water commercial fisheries investigations, investigations pertaining to game fishes, and shell-fisheries investigations. Commercial fishery investigations are organized under six distinct sections, each with a responsible technical head. The North Atlantic fishery investigations, directed by O. E. Sette, are conducted from headquarters located at the Harvard Biological Institute, Cambridge, Mass., the Woods Hole Biological Laboratory serving as headquarters during the summer season only. The South Atlantic staff is housed at the Fisheries Biological Laboratory, Beaufort, N. C., under the direction of Dr. H. F. Prytherch. Investigations in the Gulf, directed by Dr. F. W. Weymouth, chiefly concerned with the great shrimp fishery, are conducted from headquarters provided by the Conservation Department of Louisiana at New Orleans. Fishery investigations in interior waters, under Dr. M. M. Ellis, including studies of pollution of the Mississippi River system and the propagation of fresh-water pearl mussels, are facilitated by laboratories provided by the University of Missouri, Columbia, Mo. Great Lakes fishery investigations, directed by Dr. John Van Oosten, are centered at the University of Michigan, Ann Arbor. The staff for the Pacific coast and Alaska fishery investigations, directed by Joseph A. Craig, is housed at the new Fisheries Biological Laboratory, Seattle, which was completed during the past year and is adjacent to the campus of the University of Washington.

Although the division of scientific inquiry conducts no investigations directly concerned with angling, a considerable amount of attention is given to problems of interest to the angler inasmuch as they concern the food and game fishes of interior waters, their culture, distribution, and their planting in depleted or formerly barren waters.

These investigations are of various types. The original distribution and taxonomic distinctions of the Salmonidæ of New England have been investigated by Dr. W. C. Kendall. While the chief investigator in aquiculture, Dr. H. S. Davis, is located in Washington, D. C., studies under his direction in the interest of fish culture, pathology of fishes, fish nutrition, and selective breeding are conducted at the Fisheries Biological Laboratory, Fairport, Iowa, at the experimental trout hatchery, Pittsford, Vt., at the experimental trout and bass station at Leetown, W. Va., and at certain cooperative stations where facilities are provided. Headquarters for trout-cultural investigations and stream surveys conducted by Dr. A. S. Hazzard in the national parks and forests of the Rocky Mountain region are maintained at the University of Utah, Salt Lake City, while California trout investigations carried on by Allan C. Taft are centered at Stanford University.

As a by-product of studies on the life history of fishes in Chesapeake Bay, John C. Pearson produced a popular Fishery Circular on the sport fishing in those waters.

The chief oyster investigator, Dr. Paul S. Galtsoff, is also located in Washington, but field laboratories have been established at Milford, Conn., and a cooperative laboratory for oyster research on Puget Sound is furnished by the State of Washington at Olympia. Research is conducted on the physiology of oysters at the Woods Hole (Mass.) laboratory during the summer months, and the studies on oyster culture in the South Atlantic area are also under the technical supervision of the chief oyster investigator.

Studies of the razor clam in Alaska were conducted independently by investigators temporarily detailed to that work.

During the past year the division has operated a number of vessels, launches, and floating laboratories in the conduct of its scientific investigations. Various phases of the North Atlantic fisheries investigations have required the full time of the *Albatross II*, a 150-foot steam vessel equipped for oceanographic work and experimental trawling. The *Phalarope*, a 110-foot steam yacht, and a chartered power boat in New Jersey have also been employed part time. Fishery studies in Lake Michigan have been prosecuted from the motor ship *Fulmar*, a 102-foot vessel equipped for experimental fishing and limnological studies. An able 38-foot cabin motor cruiser and various smaller launches are stationed at the Beaufort (N. C.) laboratory and two seagoing launches, 45 and 65 feet, respectively, are used by the shrimp investigators of the Gulf. On the Mississippi River two house boats and various launches provide laboratory and collecting facilities, one an 85-foot quarter boat on the lower river houses Doctor Ellis's staff of a dozen coworkers and has a large, well-equipped physiological and chemical laboratory, and another 50 feet long is stationed in the Upper Mississippi Wild Life and Fish Refuge for limnological work. In Alaska a 45-foot launch is used exclusively for herring investigations and various others of the bureau's fleet of vessels are employed as circumstances warrant.

In order to bring before the public certain research activities closely related to the bureau's studies of the Pacific salmon, the work undertaken at odd times during the last 12 years by Dr. Henry B. Ward, of the University of Illinois, should be mentioned. At intervals during the summers since 1918 Doctor Ward has been engaged in research on problems related to the migration of the sockeye salmon supported by funds of the bureau but conducted independently of the division of scientific inquiry.

These studies, while of great interest scientifically, have produced results that promise considerable practical application, especially since the salmon, an anadromous species, is produced in a region where the interests of conservation and hydroelectric power development have been and will continue in violent conflict.

The nature of these studies by Doctor Ward is indicated by the following titles, which are recommended to the critical attention of fishery students and conservationists:

Some features in the migration of the sockeye salmon and their practical significance. Proceedings of the American Fisheries Society for 1920, pp. 387–426.

Some of the factors controlling the migration and spawnings of the Alaska red salmon. Ecology, vol. 2, No. 4, October, 1921.

The influence of a power dam in modifying conditions affecting the migration of salmon. Proceedings of the National Academy of Sciences, vol. 13, No. 12, December, 1927, pp. 827–833.

Further studies on the influence of a power dam in modifying conditions affecting the migration of the salmon. Proceedings of the National Academy of Sciences, vol. 15, No. 1, January, 1929, pp. 56–62.

Some responses of sockeye salmon to environmental influences during fresh-water migration. Annals and Magazine of Natural History, 10th series, vol. 6, No. 31, 1930, pp. 18–36.

The division also maintains contact with the research program of the fisheries of the North Atlantic and progress in biological investigations relating to these fisheries conducted by the various Governments concerned through the annual meetings of the North American Council on Fishery Investigations—an international scientific advisory body composed of representatives of Canada, Newfoundland, France, and the United States. The eighteenth meeting of this organization was held on September 29 and 30, 1931, at Ottawa, at which the United States was represented by the chairman, Dr. Henry B. Bigelow; by Henry O'Malley, Commissioner of Fisheries; and by Elmer Higgins, chief of the division of scientific inquiry.

The division also maintains contact with the research program of the International Passamaquoddy Fisheries Commission, engaged in studies of the Passamaquoddy region, the coastal waters of Maine, and the Bay of Fundy, with special reference to the probable effect upon the fisheries of projected hydroelectric development at the mouth of Passamaquoddy Bay. O. E. Sette, in charge of the division's North Atlantic fishery investigations, is one of the United States commissioners, and a technical advisory committee to the commission includes Dr. Henry B. Bigelow and Prof. A. E. Parr, both of whom are engaged in cooperative researches with the division's staff. Several meetings of this commission during the year have been attended by these gentlemen and on occasion by the chief of the division acting for the Commissioner of Fisheries.

During the year 21 scientific or administrative reports were published under the supervision of the division or as a result of investigations of its staff. The list of papers follows:

CHAMBERLAIN, THOMAS K.

Annual growth of fresh-water mussels. Bulletin, Vol. XLVI, 1930, pp. 713–739, 20 figs. Document 1103.

COWLES, R. P.

A biological study of the offshore waters of Chesapeake Bay. Bulletin, Vol. XLVI, 1930, pp. 277–381, 16 figs. (graphs only). Document 1091.

ELLIS, M. M.

A survey of conditions affecting fisheries in the upper Mississippi River. Fishery Circular No. 5, 18 pp.

Some factors affecting the replacement of the commercial fresh-water mussels. Fishery Circular No. 7, 10 pp.

ELLIS, M. M., AMANDA D. MERRICK, and MARION D. ELLIS.

The blood of North American fresh-water mussels under normal and adverse conditions. Bulletin, Vol. XLVI, 1930, pp. 509–542, 14 figs. Document No. 1097.

FEDERIGHI, HENRY.

Studies on the oyster drill (*Urosalpinx cinerea*, Say). Bulletin, Vol. XLVII, pp. 85–115, 7 figs. Bulletin No. 4.

GALTSOFF, PAUL S.

Survey of oyster bottoms in Texas. Investigational Report No. 6, 30 pp., 14 figs., 1 map.

GALTSOFF, PAUL S., and DOROTHY V. WHIPPLE.

Oxygen consumption of normal and green oysters. Bulletin, Vol. XLVI, pp. 489–508. Document No. 1094.

GINSBURG, ISAAC.
Juvenile and sex characters of *Evorthodus lyricus* (Fam. Gobiidæ). Bulletin, Vol. XLVII, pp. 117–124, 2 figs. Bulletin No. 5.

GUTSELL, JAMES G.
Natural history of the bay scallop. Bulletin, Vol. XLVI, 1930, pp. 569–632, 32 figs. Document No. 1100.

HIGGINS, ELMER.
Progress in biological inquiries, 1929. Appendix XV, Report, Commissioner of Fisheries, 1929, pp. 1069–1121, 11 figs. Document No. 1096.
Progress in biological inquiries, 1930. Appendix III, Report, Commissioner of Fisheries, 1931, pp. 553–626, 8 figs.

HOPKINS, A. E.
Temperature and shell movements of oysters. Bulletin, Vol. XLVII, pp. 1–14, 10 figs. Bulletin No. 1.

HOPKINS, A. E.
Factors influencing the spawning and setting of oysters in Galveston Bay, Tex. Bulletin, Vol. XLVII, pp. 57–83, 18 figs. Bulletin No. 3.

HOPKINS, A. E., PAUL S. GALTSOFF, and H. C. MCMILLIN.
Effects of pulp-mill pollution on oysters. Bulletin, Vol. XLVII, pp. 125–186, 50 figs. Bulletin No. 6.

PEARSON, J. C.
Sport fishing in Chesapeake Bay. Fishery Circular No. 1, 19 pp., 11 figs.

RICH, WILLIS H., and EDWARD M. BALL.
Statistical review of the Alaska salmon fisheries, part 2: Chignik to Resurrection Bay. Bulletin, Vol. XLVI, 1930, pp. 643–712, 11 figs. Document No. 1102.

ROUNSEFELL, GEORGE A.
Fluctuations in the supply of herring (*Clupea pallasii*) in southeastern Alaska. Bulletin, Vol. XLVII, pp. 15–56, 26 figs. Bulletin No. 2.

SETTE, O. E.
Outlook for the mackerel fishery in 1931. Fishery Circular No. 6, 20 pp., 4 figs.

WEYMOUTH, F. W., and H. C. MCMILLIN.
Relative growth and mortality of the Pacific razor clam (*Siliqua patula*, Dixon) and their bearing on the commercial fishery. Bulletin, Vol. XLVI, 1930, pp. 543–567, 11 figs. Document No. 1099.

WEYMOUTH, F. W., and SETON H. THOMPSON.
The age and growth of the Pacific cockle (*Cardium corbis*, Martyn). Bulletin, Vol. XLVI, 1930, pp. 633–641, 7 figs. Document No. 1101.

In addition to these papers, the following were published by the staff during the past year in other than the bureau's series.

FIRTH, F. E.
A note on spawning rosefish, *Sebastes marinus* L. Copeia, No. 2, p. 65.
Some marine fishes collected recently in New England waters. Bulletin, Boston Society of Natural History, No. 61, pp. 8–14.
Rare fishes from off North Carolina. Copeia, No. 4, p. 162.

GALTSOFF, P. S.
The weight-length relationship of the shells of the Hawaiian pearl oyster, Pinctada sp. American Naturalist, Vol. LXV, pp. 423–433.
Specificity of sexual reaction in the Genus Ostrea. Collecting Net, Vol. VI, pp. 277–278.

HERRINGTON, W. C.
The Bureau of Fisheries haddock investigation. Fishing, Vol. XI, No. 2, pp. 12, 47–49.

KOEHRING, VERA.
Thermal relationships in the neutral-red reaction, 1931. Journal Morphology and Physiology, vol. 52, No. 1, pp. 165–194.

PRYTHERCH, HERBERT F.
The rôle of copper in the setting and metamorphosis of the oyster. Science, April 17, 1931, vol. 73, No. 1894, pp. 429–431.
The U. S. Fisheries Biological Station at Beaufort, N. C. Collecting Net, August 29, 1931, pp. 257–260.

SCHROEDER, W. C.
Notes on certain fishes collected off the New England coast from 1924 to 1930. Bulletin, Boston Society of Natural History, No. 58, pp. 3–8.
An account of the fishes dredged by the *Albatross II* along the continental slope south of New England in February and March, 1929. Copeia, No. 2, pp. 41–46.
SETTE, O. E.
Research ship for the U. S. Bureau of Fisheries. Fishing, Vol. XI, No. 10, pp. 9–11.

In previous reports mention has been made of extensive cooperation in fisheries research by States and other institutions. Such cooperation has been continued, and even extended, to a most gratifying degree during the past year. Not only has official support and encouragement in specific projects been accorded by the States, but active participation, either through the furnishing of considerable funds or by coordinated activities on the part of the research staffs of the individual State fish and game commissions, has been undertaken to such an extent that activities of the bureau's staff have been more effective and extensive than would have been the case otherwise. Such cooperation, which is gratefully acknowledged by the bureau, is in most cases mentioned in connection with the various investigations in the following pages.

The following progress reports covering the more important investigations of the division during the calendar year 1931 were prepared in the main by the investigators in charge of the various projects.

## NORTH AND MIDDLE ATLANTIC FISHERY INVESTIGATIONS

Studies of important food fishes of the Atlantic coast north of Cape Hatteras continued during 1931 to obtain much needed information on the effects of natural conditions and commercial exploitation on the abundance of cod, haddock, mackerel, squeteague, scup, butterfish, and winter flounders. The scientific staff has had its headquarters at Cambridge, Mass., where the Museum of Comparative Zoology and the Biological Laboratories of Harvard University have generously provided laboratory and library facilities. This association with the university has facilitated consulation with members of the faculty when advice was needed in special phases of zoology, physiology, chemistry, physics, and oceanography; and specially valuable has been the counsel of Dr. Henry B. Bigelow, professor of oceanography at Harvard University and director of the Woods Hole Oceanographic Institution. The continued cooperation of Prof. A. E. Parr, curator of the Bingham Oceanographic Foundation at Yale University, in directing and conducting studies of the early life histories of fishes along the coast of New Jersey has been an invaluable supplement to the studies of the commercial fisheries of that region. The New York aquarium has also kindly assisted in the work by making collections of young fishes with its station vessel, the *Sea Horse*, and many courtesies have been extended by the Woods Hole Oceanographic Institution and the Marine Biological Laboratory at Woods Hole. The cooperation of these various organizations, the friendly willingness of fishermen to give information on their fishing operations, in some cases expending considerable effort in the keeping of log-book records, and the kindness of fishing companies

in putting business records at the disposal of our staff and providing facilities for them on board their vessels and in their shore establishments, which have made possible the progress reported in the following sections, is gratefully acknowledged.

## HADDOCK

The investigation of the haddock fishery has been carried on during 1931 by several investigators under the immediate direction of W. C. Herrington.

*Statistical and biological studies of the haddock population.*—During the past two years the haddock fishery of New England has experienced a sharp decline, following a period of exceptional productiveness. On the fishing grounds, principally Georges Bank and South Channel, where the bulk of the United States landings have originated during the past few years, the abundance of haddock, as measured by the average catch per trawler per day's fishing, increased markedly from 1924 to a maximum in 1927. Since then it has fallen off sharply to a level in 1930 far below that in 1924. This drop continued during the first half of 1931.

The decline beginning in 1928 did not at first seriously affect the fishery. By means of longer trips and fewer days spent in port, the fishing time was increased until it more than compensated for the decreasing abundance, so that the catch per trawler continued to rise. In addition, the total catch was considerably augmented by the increase in the size of the fleet through the construction of new craft. As a result, the total landings continued to increase until 1929, although the catch per day's fishing began to drop during the last part of 1927. By 1930 the level of abundance had fallen to a point where the total catch could no longer be maintained, in spite of increased fishing effort, and there was consequently a decided decrease in total landings in 1930 which continued in 1931.

By combining with the statistical analysis a study of the biology of the haddock stock, primarily size and age composition, growth rate and distribution, the causes of this change in abundance as reflected in the catch per unit of fishing effort are gradually becoming clear. It now appears that between 1920 and 1922 one or more extraordinarily successful haddock year classes were produced. In 1924 the largest of these fish had grown large enough to increase the catch of scrod haddock. In 1925 the full effect of this group was reflected in scrod landings, which were the greatest of any year since 1924, when our detailed records began. In addition, the larger members of this class were then of a sufficient size to be included in the category of "large haddock." In 1926 and 1927 as the full numbers of this enormous group came within the category of "large haddock" and as their total weight increased through growth, the abundance of haddock on the banks, as measured by the number of pounds caught per day's fishing, increased rapidly until a peak was reached in 1927. Since 1927 the catch statistics do not indicate the production of any year class at all comparable in numbers to those of the earlier period. In fact, since 1925 the catch of scrod has become successively less, in 1930 reaching the lowest point on record. Following this, in the latter part of 1931 there was a

marked increase in the scrod catch, the cause of which will be discussed later.

The increasingly intensive fishery for "large haddock," combined with the nonappearance of any year class of juveniles comparable to those of 1920–1922 to recruit the ranks, resulted in a rapid decline in the stock of fish which was necessarily reflected in the catch. The staggering nature of this decline is illustrated by records of one large group of trawlers. The average catch per trawler per day's fishing of this group on all banks decreased from about 19,000 pounds in 1927 to about 5,500 pounds in 1930.

It is obvious that there is no reason to expect an increase in the haddock population except through the appearance of numerous young from a successful spawning season, or through the immigration of large numbers from some great reserve stock not now known. The latter is a possibility frequently suggested by those connected with the fishery, but we have as yet obtained no data which in any way support it. Consequently, our hope for the immediate future must lie in the small haddock now present on the banks but still too small for commercial use. It is these fish which will determine the trend of the fishery during the next several years.

Work carried on during the past year, both at sea and on shore, has shown that there is now present on the banks a group of small haddock forming the most numerous year class which has appeared during the past several years. In the latter part of 1931 the largest individuals of this group were of sufficient size to be used as scrod, and their presence was reflected in the commercial catch by a remarkable increase in the scrod landings during the latter part of the year. By the summer of 1932 the main part of this class should be of scrod size and by the following summer the majority should qualify as "large haddock." But this will vary considerably on different banks according to the growth rate of the fish in different regions. On Browns and Western Banks this group appears to be present in considerable numbers; but due to a slower growth rate, the fish are of smaller size and consequently will not affect the commercial catch until later.

At present we are in no position to predict how far this influx of young haddock will go in restoring the fishery to the abundance of the past few years. Before such forecasts are possible it will be necessary to follow several groups through their life span in the commercial fishery to determine what effect a year class of a given abundance will have on the commercial catch over the period of years through which it is subject to the fishery. It seems safe to predict, however, from our present data, that the catch of scrod per day's fishing should continue at a high level during 1932, while there will be no permanent improvement in the catch of "large haddock" until the present scrod class reaches a sufficient size to qualify as such. On Georges Bank this should take place during the fall of 1932 and spring and summer of 1933, though some effect may be felt in the catch of "large" as early as the summer of 1932, especially in the Channel region.

It should be remembered, however, that the present fleet is larger than that which was operating when the 1920–1922 group was of scrod size. It is possible that the destructive effect of the larger

fleet may prevent the current group from attaining great importance, even if it was originally as numerous as the 1920–1922 broods.

*Savings-gear work.*—That there has been wholesale destruction of small fish by the gear now in use by the otter and V–D trawl fleet has long been known. Extensive records collected in 1915 and 1931 show that in those years from one-half to two-thirds of the haddock (in numbers) caught by these vessels were too small for commercial use. Similar damage was wrought among the young of other species. In the course of a year's time the aggregate number of small fish killed by this method of fishing was enormous.

A study of the problem was begun in 1931, when the haddock work began, and later tests were made of several types of experimental savings gear designed to permit the escape of fish too small for commercial use. The primary object of the experiments was to develop modifications of the commercial gear which would allow the escape of undersized fish without introducing complications that would make the gear unacceptable to the fishermen.

Except for some preliminary work at Woods Hole and on the *Albatross II*, the field work has been performed on board commercial vessels. This has made it very desirable to use a method of testing the experimental gear which would interfere with the fishing operations as little as possible. The trouser trawl was found to fit these requirements and gave very satisfactory results. The trouser trawl used consisted of a commercial otter trawl divided up the middle by a partition and with two cod-ends. The gear to be tested was placed on one leg of the trawl and the standard gear on the other.

The trouser trawl was used for preliminary tests to determine the size and mesh and type of construction necessary to permit the escape of undersized fish with no loss of marketable ones. These results were then utilized in the construction of a commercial savings cod-end. Considerable difficulty was encountered in making this gear sufficiently rugged to compare in durability with the present commercial gear on the rough bottom now being fished. A cod-end is being tested which has so far given satisfactory results. The general design is as follows:

The bottom of the cod-end is made of the same netting used in the present commercial gear. For the large boats this usually is 4-thread No. 900 manila twine doubled. The mesh measures 3–3½ inches between knot centers, stretched mesh. The taper on the top of the cod-end and 3 inches of the netting on the lower end of the top is of the same mesh as the bottom. The piece between the taper and lower end section is of 4-thread No. 750 manila twine doubled and 5-inch stretched mesh, and is knitted onto the small mesh at the upper and lower ends, taking up two small to one large mesh. The piece of large mesh is made about 20 per cent longer than the corresponding section on the bottom of the cod-end. This gives approximately the same area of netting on top and bottom and helps to keep the large top mesh open when there is anything in the cod-end. The small-meshed piece at the lower end of the cod-end top also gives additional strength to this section, where the chief strain comes in swinging the catch inboard; and if one strand is cut, no appreciable amount of the catch is lost.

On one trip to Western Bank a commercial trawl with this type of cod-end was fished alternately with a similar trawl using a commercial cod-end. It was found that with an equal catch of large haddock but one-fifth as many undersized ones were taken. The numbers of undersized fish of other species were reduced in proportion. Tests of this type of cod-end are being continued, and several improvements are being developed.

The gear experiments conducted by the bureau have been greatly facilitated through the cooperation of a number of commercial concerns. The Linen Thread Co., of Boston, Mass., and the Plymouth Cordage Co., of Plymouth, Mass., furnished much of the material and made up most of the experimental gear. Lloyd Runkle, of the former company, assisted on several field trips and had charge of constructing the experimental gear. Later in the work several commercial models were constructed by the Portland Trawling Co. in their net loft at Groton, Conn. Except for some preliminary work on the *Albatross II*, the field trials were conducted on the schooner *Exeter* and steamer *Kingfisher* through the generous cooperation of the General Sea Foods Corporation and Portland Trawling Co.

*Early-life history.*—Material has been collected during the past year concerning the location and extent of spawning areas and the movements of the eggs and larvæ during the period when they drift passively with the current. This material is used for the study of the interdependence of the various banks for their replacement of small haddock, and the causes of success or failure in the production of the different year classes.

During the haddock-spawning season in the spring of 1931 three trips were made on the *Albatross II*, each of about two weeks' duration, and covering a grid of 40 stations, spaced at 32-mile intervals each way, extending over the area from west of Nantucket Shoals to Browns Bank. At each station from one to four tow-net hauls were made, depending on the depth, using 1-meter silk nets and a Welsh trawl. The sorting and analysis of the collections have not progressed far enough to report results.

Hydrographic data, such as water samples and temperatures, were obtained at each station for the various depths, and on the last two trips 800 drift bottles were released, 10 to each station on each trip. The drift bottles were colored a brilliant yellow, a color which tests had shown to be most conspicuous under the conditions encountered. The returns from this work have been exceptionally numerous and have given us a much better conception of the surface currents in the Georges Bank region.

## MACKEREL

The mackerel is prominent among the important food fishes of the Atlantic coast, not only for the magnitude of the annual catch, which in recent years has averaged around 40,000,000 pounds annually, but also for the extreme fluctuations in abundance which have characterized this species ever since records on this fishery were first kept, early in the nineteenth century. The objective of the bureau's investigations of this species is to ascertain the nature and causes of these changes in abundance, to determine whether they may be affected by man's inroads on the stock in the sea, or whether

they are due to natural causes beyond his control of such nature that they may be foreseen and turned to advantage by appropriate adjustments in the fishery.

The work to date has shown that the changes in abundance have been due primarily to the variable number of mackerel added to the stock by each year's spawning. This probably is because conditions for survival of the very young are much better in some years than in others, so that sometimes many mackerel grow to commercial size, while in other years very few survive the first weeks or months of existence. In years of good survival so many mackerel are added to the stock that a period of plenty ensues; and, conversely, during a series of years when survival is poor, so few are added that a period of scarcity follows.

This working knowledge of the mechanism of fluctuations has been attained gradually through seven years of close observations on the volume and age composition of the market landings of mackerel and from periodic surveys of the spawning and nursery grounds of the species by the bureau's fishery research vessel *Albatross II*.

The investigations were continued during 1931 under the direction of Oscar E. Sette. The data on market landings were collected mainly at New York during May and June, at Boston from June to October, and at Gloucester during November and December. These were augmented by observations at Cape May during April, at Newport during May and June, at Woods Hole from May to October, and during the summer at various minor ports in the Middle Atlantic region.

During the year the fleet landed 3,056 fares of mackerel, aggregating 36,490,847 pounds. By interviewing the masters of fishing vessels the date, locality, and quantity caught were ascertained for 1,329 fares, and samples of mackerel were measured from 856 fares. These, together with 10,883 mackerel measured from the pound net fishery, made a total of 35,068 measurements for the season. Scale samples were taken from 1,280 mackerel. Many mackerel-vessel captains continued to cooperate by keeping detailed logs of their activities. Thanks to the kindness of the Atlantic Biological Station, St. Andrews, New Brunswick, Canada, 26 samples, affording 2,623 measurements of gill-net and trap mackerel, were collected at Pennant, Nova Scotia.

The 1931 work has supplemented our previous understanding of mackerel fluctuations in numerous respects, but perhaps the most striking evidence of the approach to thorough knowledge is the gratifying outcome of the forecast on probable abundance during 1931.[2] Before discussing this subject in detail, it should be explained that the fishery draws mainly on the mackerel that are 2 years of age or older. Mackerel younger than this weigh less than a pound, are delicate, spoil readily, and can not compete in the open market with the larger and more desirable mackerel. They usually are sold in a separate category known to the trade as blinks and tinkers. Because of the peculiar combination of economic and biological conditions that

[2] Outlook for the mackerel fishery in 1931. By Oscar E. Sette, Bureau of Fisheries, Fishery Circular No. 4, August, 1931 (approved for publication May 26, 1931).

influence the catch of these small mackerel, and because of the difficulties of getting a measure of abundance of young mackerel before they are large enough to be caught commercially, the forecast was limited to the sizes larger than blinks or tinkers. In the forecast it was estimated that the abundance of mackerel would be such as to produce a catch of 35,000,000 pounds exclusive of yearlings (provided the fishing was approximately as intensive as in the previous year). Actually, the 1931 catch slightly exceeded 32,000,000 pounds, exclusive of yearlings. Thus the forecast was within 7 per cent of the realization. There has not yet been opportunity to analyze the statistics, but we are under the impression that the fleet was approximately the same size and as active as in the previous year. When it is recalled that the catch of mackerel is sometimes subject to fluctuations of the order of 50 or 100 per cent, the closeness of the prediction may be appreciated.

The satisfactory outcome of the 1931 prediction must not be received as an indication that forecasting is established on a sound basis; on the contrary, there are elements in the behavior of various contingents of mackerel which may easily prove disconcerting in future predictions. For instance, the 1928 class of mackerel appears to have had a much higher loss rate than the 1923 class at a similar age. It remains to be determined whether this was due, in fact, to a difference in death rate or to an artifact traceable to a more intensive fishery at one time than the other. There is also the additional possibility that neither was the case, for the same effect might be produced by an intrinsic difference in the habits of the 2-year classes which might render them susceptible to larger catches at one stage of their life history than at another. A notable difference in the areas frequented by these year classes strongly hints at this possibility. Continued observations and more intensive analysis of the data are in order.

An equally serious weakness in the observations from the standpoint of forecasting methods is the inability to get a measure of abundance before a year class is first old enough to be an important component of the commercial catch. This difficulty may be overcome by discovering the cause of variations in the size of the year classes so as to estimate the abundance independently of the commercial fishery, and in advance of the earliest exploitation. To this end the fisheries-research steamer, *Albatross II*, has periodically cruised the spawning and nursery areas of the mackerel in order to collect data as to the abundance of the eggs and young stages, and as to the physical, chemical, and biological conditions in the environment which might have an influence on the number surviving the hazards of their early existence. While it is yet too early for conclusive results, differences in the abundance of late larval stages have been discovered that may prove useful to indicate the numerical strength of the year classes. Particularly noteworthy was the widespread presence of late larvæ in 1931, the significance of which will be established when these mackerel become of commercial size in 1932 and 1933.

The work on the spawning grounds should not only aid in arriving at more reliable forecasts but should also provide information as to the conditions that control the production of successful year

classes. This is a question of fundamental importance in fisheries science, and its answer would be of inestimable value to the solution of fishery problems.

To provide data for the interpretation of findings on the mackerel-spawning grounds, with special reference to the influence of ocean drifts in transporting fish eggs and larvæ, experiments on the rate of development of mackerel eggs were carried out by Leonard G. Worley during the spring of 1931. He found that the eggs of this species hatched in 6½ days at 11° C. and 2 days at 21° C., with corresponding incubation periods for intermediate temperatures. In addition, it was found that the limits of successful hatching were between 10° C. and 22° C., with the maximum percentage hatching at 16° C.

## COD

Studies of the migratory habits and other phases in the life history of the cod were continued by William C. Schroeder during 1931, though field work was limited by the requirement of personnel and vessels on other projects. Marking experiments were made in the following localities: (*a*) Woods Hole, Mass., January 8–9; (*b*) Nantucket Shoals, August 10–11; and (*c*) Mount Desert, Me., June 21–29.

The results in general resembled those of the preceding years, corroborating earlier conclusions that many of the cod which summer off southern Massachusetts migrate westward in the fall to winter off Rhode Island and the Middle Atlantic States region, but that the shore cod of eastern Maine remain for the most part localized, a few of them moving north and east to Nova Scotia.

A total of 45,452 cod was tagged at sea from 1923 to 1931, of which 3,204, or about 7 per cent, were reported recaptured, the returns from some lots of fish being as low as 1 per cent, while from others they have been as high as 35 per cent. In addition, 2,223 cod were tagged and liberated at the Woods Hole fisheries station from 1926 to 1931, of which about 3¼ per cent were reported recaptured.

A new type of tag made of two small, thin celluloid disks, resembling the Scottish plaice label, was devised by R. A. Nesbit in connection with his study of tagging methods useful for Middle Atlantic fishes. This celluloid tag was used for tagging cod during 1930 in place of the metal-strap tag employed in previous experiments; and although but little more than a year has elapsed, it gives promise of being much more efficient than the old one. For example: Whereas only about 3 per cent of the Monel-metal tags were recovered the first year from cod tagged on Nantucket Shoals during 1923–1929, the returns from the celluloid tags used in that locality in October, 1930, amount to 15 per cent for the succeeding 12-month period. While these favorable returns demonstrate the superiority of the new style tags during the first year of release, it still remains to be seen whether they persist during later years.

The results so far obtained from this new disk tag make it desirable to continue cod-marking experiments on the prolific offshore grounds, from which only meager data have been obtained; chiefly, perhaps, because of the inefficiency of the metal-strap tag. An important objective is determination of the sources of replenishment for the

stocks of commercial-sized cod on the offshore banks—especially whether these grounds are self-supporting or whether they depend in a large measure on immigration of juveniles and adults from other grounds. The continued marking of 1, 2, and 3 year old fish in the shore waters along the coast of Maine, an important nursery for young cod, is expected to throw some light on this question. In past experiments in this region the marked fish have been rapidly caught up by local fishermen and the tags were seldom carried by the fish for more than a year. However, by marking in localities not ordinarily visited by fishermen and by using improved types of tags it is hoped to trace the migration of these young fish when they become older and move offshore.

### WINTER FLOUNDER

As mentioned in the previous annual report, such concern has been felt over the welfare of the flounder fishery that certain waters have been closed by State law to flounder draggers during a portion of the season. A comprehensive investigation is therefore urgently needed to determine whether in fact this species is being overfished; and, if so, what practical methods of conservation should be adopted. Though the means for such an investigation have not been available to the bureau, a limited program was begun in 1931 that throws some light on the pertinent question of whether the winter flounder *Pseudopleuronectes americanus*, migrates widely from place to place or whether the various grounds have separate, self-perpetuating populations. In the one case overfishing at any one place would reduce the population at other places also. In the other case the effects of overfishing would be felt only in the locality in which it occurred. Obviously, this information is a preliminary necessity for an understanding of the ability of the species to support the commercial fishery and for designing protective measures if such be needed.

In Waquoit Bay, near the United States Fisheries Biological Station, Woods Hole, Mass., a concentration of winter flounders regularly occurs, many of which are spawning fish. Mixed with the spawners are juveniles, immatures, and spent individuals. During the period from February 13 to April 3, 1931, 4,179 flounders, both young and old, were tagged and released. The work was done by Robert A. Goffin and Henry M. Bearse under Robert A. Nesbit's supervision. The tag used was similar to the Scottish plaice label, consisting of two celluloid disks held together by nickel wire passed through their centers. About half of the flounders were tagged just below the dorsal fin immediately posterior to the head; the remainder at a similar point midway between snout and tail.

Returns to December 31, 1931, totaled 84 fish, exclusive of 56 which were taken by the hatchery's fishing crew within 40 days of the time of tagging and again released. These recaptures show that there is a definite movement of flounders in spring toward offshore waters, mostly eastward through Nantucket Sound, but with a few straying westward through Buzzards Bay or Vineyard Sound. By summer time tagged fish were recaptured for the most part in the open waters

both north and south of the mouth of Nantucket Sound. A few returns were from the shores of Long Island, some 150 miles to the westward of the tagging locality. In the autumn returns were reported from the sounds, and by December several were recaptured in Waquoit Bay, where they had been caught and tagged nearly a year previously.

## SHORE FISHES OF THE MIDDLE ATLANTIC STATES

Investigation of the causes of fluctuations in yield of the shore fishes of the Middle Atlantic States, begun in 1927, was continued under the direction of R. A. Nesbit. Field bases were maintained during part or all of the 1931 fishing season at Woods Hole, Mass.; Newport, R. I.; Montauk and Fire Island, N. Y.; and Belford, Long Branch, Deal, Seaside Park, Beach Haven, and Wildwood, N. J. At these bases the principal data obtained were detailed records of the catch, with length-frequency observations of the principal species occurring in the region (squeteague, scup, butterfish, sea bass, and summer flounders) and the collection of squeteague scales.

*Squeteague.*—Especial attention has been paid to analysis of the data pertaining to squeteague, this being the most important species of the region, the yield of which in New York has recently been so low as to cause concern. Procedure in 1931 was directed toward determining whether the stock of squeteague north of Delaware is self-perpetuating or whether it is maintained by migration of fish from southern waters. One thousand four hundred and ninety-three squeteague, mostly yearlings, were tagged by W. C. Schroeder in Chesapeake Bay during October, 1931, with the expectation that should any general northern migration of these yearlings occur in 1932, they should be recaptured in the New Jersey and New York region. A second line of procedure consisted of careful studies of the scales to determine whether squeteague from different localities show significantly different rates of growth. Remarkable differences between the growth increment of the third and subsequent summers were noted in fish from different localities. Thus, the average third summer increment for squeteague at Montauk, N. Y., was three times that at Wildwood, N. J. Calculated increments for the first and second summers for fish taken in New York and New Jersey in their third and subsequent summers are in good agreement with the corresponding increments observed in Virginia fish. These observations indicate that northern stocks of adult squeteague are in part at least recruited from southern nursery grounds, but final judgment will depend on the results of tagging experiments.

The scale studies on which the calculations of growth rates were based have cast much light on the forming of the annulus or year mark. It was noted by Taylor that the annuli in the squeteague scale became apparent in July. Our observations have shown that the first annulus usually appears before the fish becomes sexually mature; hence it seems unlikely that the check is caused by the effort of spawning. Comparison of scale length with age length by months indicates that the scale ceases to grow about the first of October, although the body continues to do so. Scale growth is not resumed until the following July. As the annulus can not be seen until new

growth has begun, an annulus which really was formed in October appears to be formed in July. When the scale resumes growth it does not regain the ground lost during its period of inactivity. Consequently, the average scale length of old fish is less than that of younger fish of the same size.

Reexamination of published observations on rate of growth of herring and young cod scales relative to that of the body discloses a similar situation, with the important exception that in these species the summer growth more than compensates for the period of winter inactivity, so that the net result is a gain in scale length relative to that of the body. These facts undoubtedly are an important factor in causing the distortions which have resulted from attempts to calculate growth increments from scales.

*Scup.*—The yield of scup has been subject to wide fluctuations during the past 40 years both in New York and in New Jersey. The record since 1921, covering the period of a significant increase in yield from pound nets, is more complete for New Jersey than for New York. Hence the present discussion will be limited to consideration of fluctuations in New Jersey and their causes.

The pound-net yield, as indicated by periodic canvasses, shows low levels of abundance during the period from 1890 to 1908, followed by increases in 1917 and 1921. In 1926, however, the catches again declined to a level only slightly higher than that of 1908. In 1929 a notable increase occurred, the total pound-net catch for New Jersey rising to the highest figure since 1921. This level was well maintained in 1930 and 1931.

Compilation and study by W. C. Neville of the data on lengths of scup collected from commercial catches from 1928 to 1931 show that the sudden increase in the scup catch during 1929 was due to the influx of an abundant brood produced in 1927, which first reached commercial size in 1929. In 1928 this group was heavily represented in the catches sampled, but as the fish were below legal size they had no effect on the reported yield.

When they reappeared in large numbers in 1929 they were salable, and raised the reported yield to record figures. But continuation of high pound-net yields in 1930 and 1931 was due only in part to the continued presence of the 1927 brood, for the 1928 brood was also large and served to offset the diminution in the numbers of 1927 fish returning in these years.

It is to be noted that both the 1927 and 1928 broods were produced in years in which the pound-net yield was at a low ebb. If the pound-net yield constitutes a reliable index of actual abundance of scup, it might be inferred that even a greatly reduced stock is capable of producing sufficient numbers of eggs to restore high levels of abundance, provided conditions for development are favorable.

That this is not necessarily the case is indicated by data from the offshore fishery during the past few years. In 1928 otter trawlers, purse seiners, and offshore pounds located on Five Fathom Bank took fair numbers of larger and older scup than those which made up the scanty inshore pound-net catch of that year. In 1929, when large catches of scup of the 1927 brood were made inshore, the offshore fishing took few of these, depending, as in 1928, on a stock of older and larger fish than those found inshore. In 1930, and to a greater

extent in 1931, the 1927 brood began to affect the offshore yield, coincident with lessened importance in the inshore catch.

It thus appears that on reaching commercial size, scup first are taken by the inshore pounds. As they become older and larger they are no longer available to this gear, but are taken by the offshore fishery.

In view of the complete recovery of the fishery in 1929 and subsequent maintenance of satisfactory yields it is apparent that the scup is not in need of protection from the fishery as carried on prior to 1929, for the offshore fishery was of such small proportions that it took only a small toll from the spawning reserve of large adults which escaped the pound net fishery.

Since 1929, however, two important changes in the fishery necessitate careful reexamination of the capacity of the scup to withstand the strain imposed. The first is a rapid expansion of the offshore otter-trawl fishery during the summer, and the second the rapid growth of a winter-trawl fishery (2,000,000 pounds were landed in 1930–31). Although this fishery is conducted in southern waters, there is a possibility that it takes toll of a stock drawn from the summer population of the whole Middle Atlantic region.

The increased summer-trawl fishery and possibly the winter fishery have increased the toll taken from the stock of older fish previously protected from man and available as a spawning reserve. Just what the minimum size of the scup population need be in order to maintain an adequate spawning reserve is an open question. Although it has been shown that the 1927 and 1928 broods were the result of a spawning population that certainly was not taken in large commercial quantities by the inshore pound nets in these years, there still remains the probability that these broods may have resulted from the spawning activity of the larger offshore fish, the existence of which was not realized prior to the growth of the offshore-trawl fishery.

Thus the principal threat to the welfare of this fishery is the possibility that the spawning reserve may be reduced beyond safe limits. In order to determine whether this is the case it is planned to:

(1) Observe rate of decline of important broods as shown by catch records and continued length data.

(2) Estimate the fishing strain from recapture of scup tagged at appropriate points. The tagging program will also serve to indicate the extent to which the winter fishery imposes an additional strain on the scup population of the Middle Atlantic States. This project was begun in 1931 by the tagging of 1,000 scup at Woods Hole, and 1,500 at a number of points between Cape May, N. J., and Cape Charles, Va. Additional tagging will be done off the Virginia coast during the winter of 1931–32.

Utilization of any surplus in excess of spawning needs is desirable, otherwise the more valuable commercial sizes would be wasted; but pending the outcome of the investigation described above, no restriction of the fishery is recommended.

*Butterfish.*—In the early years of the Middle Atlantic fisheries the butterfish, like the whiting to-day, was incompletely utilized. At present, however, the demand is ordinarily sufficient to insure profitable sale of all that are taken. It has become one of the mainstays

of the pound-net fishery. In view of its present importance it is desirable to determine whether it is in need of protection to insure continuation of satisfactory yields.

Analysis by H. M. Bearse of length-frequency data for three years, coupled with the results obtained from study of the catch records, has shown that the abundance of butterfish is definitely related to variations in success of reproduction from year to year. The New Jersey State records and the individual pound-net company records show an unusually good catch per unit of gear for the year 1929. The length frequencies for the year 1928 demonstrate the presence of a group of small and medium fish dominating the catches at most points along the coast; those for 1929, a group of medium and large fish appearing in overwhelming numbers; and those of 1930, dominated by large fish. From the consistent behavior of the size variations for the three years it is clear that the catches during that period have been made up largely of fish resulting from a single spawning, presumably that of 1926.

The effect of this large brood was to increase the total catch of butterfish as well as the catch per unit of gear for the season of 1929 in New Jersey. Although a large proportion of the fish taken by pound nets in 1928 and 1930 was of the same brood as those taken in 1929, the yields for these years were moderate. In 1928, however, these fish were for the most part too small to be salable, and the majority of those taken did not enter into the recorded catch. The decline in 1930 probably was due either to natural mortality and to the fishing, or to a change in habits with age similar to that described for the scup. No evidence on this point is available, as few butterfish are taken by gear other than pound nets.

It appears, therefore, that the restoration to nearly record levels in 1929 without protection demonstrates the ability of the butterfish to withstand the strain of the fishery, unless unforeseen developments should increase the exploitation of this species.

*Early-life histories.*—Studies of spawning and nursery grounds of Middle Atlantic fishes were continued under the able direction of Prof. A. E. Parr, curator of the Bingham Oceanographic Foundation, Yale University. The work which began in Delaware Bay in 1929 was continued in 1931 and extended to Barnegat Bay and Sandy Hook Bay. Many data bearing on the abundance and rate of growth of young squeteague, scup, spot, and sea bass were collected.

Of special interest is the observation that the presence of even very small juveniles in a locality does not necessarily imply successful local reproduction. This is illustrated by two species—the mullet, *Mugil cephalus*, and the spot, *Leiostomus xanthurus*. The former species does not spawn in New Jersey; in fact, it is doubtful whether the adults occur there at any time; yet juveniles are common. Juveniles of the spot, less than an inch in length, appear along the shores of New Jersey and New York. Since this species spawns in winter when neither adults nor larvæ occur north of the mouth of Chesapeake Bay, these juveniles can not have resulted from local spawning; but they must have migrated from localities well to the south, perhaps in part from North Carolina waters. While they are in

New Jersey, young spot grow more rapidly than those which remain in the South.

The interdependence of northern and southern stocks of spot is further evidenced by facts pointing toward a southward migration of young spot in the autumn, for their disappearance at that season from New Jersey waters is accompanied by a sudden increase in average length of the stock of spot in North Carolina, due doubtless to the addition of the faster-growing northern spot to the North Carolina population. This view is supported by the winter recapture in North Carolina of a young spot which had been tagged in New Jersey the previous October.

As in 1929 and 1930, large collections of squeteague eggs were made in June, 1931, near the mouth of Delaware Bay, but no larvæ were taken. Although numerous juveniles were taken subsequently, they appeared too late to have resulted from the spawning noted. It remains an open question whether these juveniles resulted from local spawning which escaped observation or whether they, like the spot, migrated while still very small from the southern grounds where larvæ as well as eggs have been captured.

## OCEANOGRAPHIC STUDIES

As more and more of the fluctuations of our fisheries are traced to variations from year to year in the survival of the early stages of various species, the discovery of the causes of this variation becomes more and more urgent. This involves a greater understanding of oceanographical conditions than has yet been attained. Although the bureau does not have the means to enter into this field at present, it has been fortunate in having the study of the physical oceanography and the plankton of the waters overlying the continental shelf between Cape Cod and Cape Hatteras undertaken by Dr. Henry B. Bigelow, director of the Woods Hole Oceanographic Institution, and Mary Sears.

Much of the material necessary for this study has been accumulated on cruises made by the *Albatross II* in that area for investigation of the spawning of the mackerel. Additional data and collections are being secured by the research ship *Atlantis* of the Woods Hole Oceanographic Institution to supplement collections already made.

A résumé of oceanographic work done by the *Albatross II* during 1931 appears in the accompanying table.

TABLE 1.—*Summary of offshore oceanographical work done in conjunction with cod, haddock, mackerel, and shore-fish investigations, 1931*

| Date | Station numbers [1] | General locality | Number of stations occupied | Temperature and salinity observations | Collections made | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Serials, surface to bottom | Phytoplankton surface horizontal | Zooplankton oblique | Welsh trawl | Otter trawl |
| Feb. 13-14 | 20877-20883 | Massachusetts Bay and Georges Bank. | 7 | 7 | 6 | 11 | | |
| Feb. 17-Mar. 5 | 20884-20922 | No Mans Land, Mass. to Ocracoke Inlet, N. C. | 39 | 39 | 7 | [2] 37 | | [3] 27 |
| Mar. 19-31 | 20923-20963 | Georges Bank and Nantucket Shoals | 41 | 41 | 41 | 84 | 3 | |
| Apr. 16-29 | 20964-21003 | do | 40 | 40 | 39 | 83 | 8 | [3] 8 |
| May 16-22 | 21004-21038 | No Mans Land, Mass. to Assateague, Va. | 35 | 35 | 35 | 66 | 11 | |
| May 26-June 9 | 21039-21075 | Georges Bank and Nantucket Shoals | 37 | 37 | 37 | 80 | 22 | |
| June 12-19 | 21076-21116 | Cape Cod Bay to Chesapeake Bay. | 41 | 41 | 41 | 89 | 21 | |
| July 7-16 | 21117-21152 | Cape Cod Bay to Barnegat, N. J. | 36 | 36 | 36 | 79 | 30 | |
| July 24-28 | 21153-21180 | Gulf of Maine | 28 | 1 | | 3 | | [4] 28 |
| Aug. 9-11 | 21181-21195 | Nantucket Shoals | 15 | 15 | | | | [4] 1 |
| Aug. 27 | 21196-21199 | Offing of Chatham, Mass. | 4 | 4 | 4 | 13 | 4 | |
| Aug. 31-Sept. 9 | 21200-21238 | Montauk Point, N. Y. to Browns Bank. | 34 | [5] 34 | | | | [3] 39 |
| | | Total | 357 | 330 | 244 | 545 | 99 | 103 |

[1] Albatross series.
[2] Includes 9 horizontal zooplankton hauls at the surface.
[3] 60-foot otter trawl.
[4] 35-foot otter trawl.
[5] Temperatures only.

## EXPERIMENTAL REARING OF FISH LARVÆ

As discussed in previous sections, many of the fluctuations in yield of our food fishes are due to variations in the success of various year classes pointing to critical stages in the early life history of the species. Studies on oceanic conditions may reveal the causes for excessive mortality in some years and nominal losses in others; but the probability of ascertaining them might be enhanced greatly if it were known what conditions of temperature, salinity, light, and other physical and chemical properties are favorable to survival of the newly hatched young of fishes, and what food materials must be provided.

Generally speaking, it has been impossible to rear the newly hatched young of marine species of fish under laboratory conditions. However, in the summer of 1929 and 1930 Louella E. Cable succeeded in rearing several fish through the larval stages in the Beaufort (N. C.) laboratory and in 1931 conducted experiments at the

Woods Hole (Mass.) station. While the larvæ were not carried through the entire critical period, the work was successful in prolonging life somewhat beyond the normal period experienced by larvæ under the artificial conditions necessary in the laboratory, and there were revealed encouraging leads for future experimentation.

## CHESAPEAKE BAY INVESTIGATIONS

After completing certain phases of investigations in the Chesapeake Bay region, a long-needed study of the life history of the striped bass, *Roccus lineatus*, in Maryland and Virginia waters was undertaken by John C. Pearson.

A study of the seasonal distribution and abundance of pelagic marine fish eggs and young fishes at the entrance to Chesapeake Bay was completed and a report submitted for publication. Besides showing the seasonal occurrence of at least 40 species of pelagic young marine fish and the location of the spawning grounds of the squeteague or gray sea trout in the Chesapeake Bay region, the investigation added to our knowledge of the life histories of many valuable food fishes, such as the gray sea trout, butterfish, harvest fish, and bluefish.

An investigation of the winter-trawl fishery off the Virginia and North Carolina coast during the winter of 1930–31 disclosed the rise of an important fishery in the South. The total yield of this fishery for the season approximated 5,600,000 pounds, valued at more than $600,000 to the fishermen. Nearly 50 trawlers engaged in the fishery, about half of this number coming from New Jersey, Massachusetts, and other northern fishing ports. Scup, croakers, summer flounders, sea bass, hake, and gray sea trout composed the bulk of the catch, although nearly all of the principal food fishes of the North, Middle, and South Atlantic States were represented. This fishery has furnished material for a paper entitled "The winter-trawl fishery off the Virginia and North Carolina coasts."

In the spring of 1931 a study was commenced to ascertain the major features of the life history of the striped bass in Chesapeake Bay. The striped bass supports one of the most valuable of Maryland's marine and fresh-water fisheries, ranking as the third most valuable food fish in price per pound in the United States. The striped bass is not only one of the leading food fishes, but it has become a leading sport fish both on the Atlantic and Pacific coasts.

The investigation of the species in Chesapeake Bay during the first year has consisted largely of migration studies. Interesting and significant results from tagging experiments are indicated. Spawning areas, rate of growth, and conservation requirements of the species will be studied during the coming year.

## SOUTH ATLANTIC AND GULF FISHERIES INVESTIGATIONS

The investigations of fishery problems in the South Atlantic and Gulf States include studies of the shrimp fisheries from North Carolina to Texas, studies in oyster culture in the States of North Carolina, South Carolina, Georgia, and Florida, and ichthyological studies of the fish fauna of the Gulf coast. In addition to

these, various activities at the Fisheries Biological Station, Beaufort, N. C., have general application to the fisheries of that region. Inasmuch as this laboratory is in operation throughout the year, the investigations conducted there during 1931 are discussed in a later section.

*Red-snapper investigation.*—In response to a request to investigate an alleged shortage of red snappers in the Gulf of Mexico and to offer suggestions for increasing the catch of fish in that region, William C. Schroeder was detailed to Pensacola from October 13 to November 2. Since the work was limited to several weeks' investigation of the Gulf's snapper fisheries, it could not be determined whether the stock of fish had suffered depletion, but it was evident that the present low yield might be materially increased by greater expenditure of effort on the part of the fishermen. Trawl-line gear such as is used off the New England coast was tried with some measure of success by using floats to keep it clear of coral, and it appears probable that Gulf of Mexico fishermen could make use of this gear in addition to hand lining, which at present is the only method used for catching ground fish in that region. It is desirable also that soundings be made in the Gulf, especially between about 30 and 120 fathoms and within about 150 miles of Pensacola, to learn whether any new fishing grounds exist within convenient distance of the local fleet.

## SHRIMP

Since 1880 the production of shrimp has been increasing at a uniform rate, doubling itself about every 8½ years, until in 1930 canned shrimp ranked as the fourth most valuable fishery product in the United States, including Alaska. This rapid increase in the fishery caused great anxiety for the future of the industry and resulted in many requests for a complete study of the problem. With the increased funds made available after the passage of the 5-year program bill, the Bureau of Fisheries was enabled to undertake an extensive investigation of the abundance and life history of the shrimp. As recorded in the report of last year, Dr. F. W. Weymouth, professor of physiology of Stanford University, Calif., was chosen to supervise the investigation.

In February, 1931, the chief of the division of inquiry, accompanied by Doctor Weymouth and Milton J. Lindner, formerly with the State Fisheries Laboratory of California, visited the chief shrimp ports for a brief survey of the state of the fishery.

The initial step of the investigators was to arrange the details of cooperation which had been offered by the various States in which shrimping is prosecuted. As this fishery extends over more than 3,000 miles of coast line, it was deemed necessary to cooperate with as many States as possible in order to obtain the most complete information with the limited funds available. Through the foresight of Commissioner Peter S. Twitty, Georgia had inaugurated investigations early in September, 1930, at Brunswick, Ga., to observe the fishery.

Louisiana, the center of the shrimp industry, offered to join the Bureau of Fisheries in a joint program. Commissioner Robert S. Maestri appointed J. N. Gowanloch to head the staff of the newly

created bureau of research and statistics to cooperate in this investigation. Through the courtesy of the department of conservation, offices for the joint staff were obtained in New Orleans, and a boat furnished by the bureau was refitted by the State and placed at the disposal of the investigators. Later Texas, through William J. Tucker, executive secretary of the game, fish, and oyster commission, expressed a desire to cooperate in the investigation. An investigator was employed and stationed at Aransas Pass, Tex., to conduct observations on the commercial catch.

International cooperation has been effected by the action of Dr. R. von Ihering of the Instituto Biologico of Sao Paulo, Brazil. In this country the shrimp fishery is of considerable importance, and Dr. von Ihering has kindly furnished statistics of the catch and valuable specimens from various localities, thus extending the scope of the inquiry far to the south and covering practically the entire range of the species.

The combined staffs, in consultation with the bureau's officials, carefully considered the problems presented by the shrimp industry, with the objectives of (1) maintaining the optimum productivity of the fishery and (2) furnishing biological information useful to fishermen, packers, and legislators. The program so formulated comprises the following fields of investigation:

(*a*) Life histories of the principal commercial species, including problems concerning breeding, spawning, embryology and larval history, postlarval growth, and longevity.

(*b*) A statistical analysis of abundance which would require a compilation of the existing data and plans for the gathering of future statistics.

(*c*) Habits and reactions of the young and adult shrimp in relation to food and food getting, migrations, molting, spawning, temperature, and salinity.

(*d*) A systemic examination of all shrimp occurring in the commercial catch in the various fishing localities and biometrical studies of the principal species throughout their range for the determination of possible racial differences which would have a bearing on problems of migration or local depletion.

(*e*) The effects of fishing in relation to gear, localities, and time on the composition of the shrimp catch and on the other species of economic importance.

(*f*) The anatomy of the principal species of shrimp in relation to spawning and feeding.

(*g*) Diseases and parasites affecting the shrimp.

It was decided that the bureau's investigators should devote their efforts mainly to classes (*a*), (*b*), (*d*), and (*e*), and the scientists of the Louisiana Department of Conservation to direct their activities toward the solution of (*c*), (*f*), and (*g*), with general consultation and cooperation in all phases of the problem.

Of the species appearing in the commercial catch *Penæus setiferus* is by far the most important and deserves the most intensive study; only two others, *Penæus brasiliensis* and *Xiphopenæus kroyeri*, are abundant enough to require consideration.

Progress toward the various objectives outlined above is being made; but because of the complexity of the problem, it seems advis-

able to defer any formulation of results until more data are available. Because of their importance, however, the trend of work in two phases may be mentioned. A satisfactory analysis of the catch statistics, especially in regard to the intensity of fishing, a question of prime importance, is impossible because of the inadequacy of the data. It will be necessary to have recourse to figures supplied by certain packers who have records of catches of individual boats over a number of years. The inadequacy of the fisheries statistics in the States concerned is so serious a handicap to investigations of this character that it is hoped in the future some of the far-sighted legislators may be able to remedy this unfortunate lack.

With regard to the life history, the size-composition analysis of the catch, particularly in Georgia, is furnishing valuable information. Although it would be premature even to outline the life history, there can be little doubt that the life span is short and that most of the fishery rests upon dangerously young or spawning individuals. It can not be too strongly emphasized that under these circumstances depletion, when it appears, is sure to run a tragically rapid course and that every opportunity should be embraced to furnish reasonable protection to this valuable animal.

## GREAT LAKES FISHERY INVESTIGATIONS

The major field investigations in the Great Lakes area during 1931 were conducted on Lakes Michigan and Huron, while minor field operations were carried on on Lake Erie and also on Lake Champlain. Only one new major project was started in 1931, viz, the investigation of deep trap nets on Lake Huron and upper Lake Michigan. The other field investigations were continuations from previous years, those on Lakes Erie and Champlain being completed in 1931. As in previous years, the bureau enjoyed the fullest confidence of the conservation departments of the various Great Lakes States and of the fishermen and worked in close harmony with them. In spite of the severe curtailment in their appropriations, the States of Michigan and Wisconsin again gave liberal financial support to the Lake Michigan program, while the State of Vermont gave generous financial assistance in the Lake Champlain work.

### CHUB-NET STUDIES IN LAKE MICHIGAN

The Lake Michigan investigation on chub nets, started in 1930 (see report for 1930) and conducted jointly with the conservation departments of Michigan and Wisconsin and a group of four fish-net and twine companies located in the Great Lakes area, was resumed in 1931, since it was found that in spite of the large numbers of fish employed in our 1930 experiments they gave no conclusive results. The primary objective of the Lake Michigan work was a study of the catch of chub nets in order to determine the selectivity of these nets with regard to chubs and to determine their destructiveness to immature trout.

The bureau's vessel *Fulmar*, again employed for the work, left its winter quarters at Sturgeon Bay, Wis., on April 23 for the first cruise of the season after having been thoroughly overhauled and painted during the winter months. Field operations continued until November 19. During this period the *Fulmar* covered a total dis-

tance of some 8,280 miles. Regular fishing operations were carried on from 6 Wisconsin ports, 5 Michigan ports, and 1 Illinois port. The usual procedure was to fish nets simultaneously out of six ports and make occasional changes in the itinerary in order to cover new fishing grounds. Nets with stretched meshes of the following sizes were fished: 2⅜, 2½, 2⅝, 2¾, and 3 inches. Data were recorded on the total bulk weights and numbers of trout and chubs taken by the nets of each size mesh. Individual lengths, weights, sex, and sexual maturity were recorded for all trout, and stomachs were preserved from occasional samples for food studies. Chubs were sorted by species, and individual biological data obtained for each species to the extent that time permitted. A grand total of 1,654 chub nets, each 510 feet long, or, in terms of total length, 159.7 miles of nets, were lifted during the season. Of these nets 929 were fished and lifted in Wisconsin waters, 576 in Michigan waters, and 149 in Illinois waters.

During the 1931 season 87,018 chubs and 8,551 lake trout were taken, which weighed 28,517 and 6,633 pounds, respectively. The figures show that both trout and chubs are more abundant in the Michigan waters than in the waters of either Wisconsin or Illinois. It is possible that this difference in abundance may be attributed to the larger mesh employed for chubs in the State of Michigan. Throughout the season it was found necessary to fish more nets on the Wisconsin shore than on the Michigan shore in order to secure adequate catches for biological data.

In addition to the fishing of experimental chub nets, certain hydrographic data were collected whenever weather permitted. This work suffered greatly during 1931 because of an unusually windy season and, hence, more complete series of data could not be obtained. The following data were secured in different parts of the lake: Temperatures, plankton samples, bottom organisms, bottom soils for geological analysis, and occasional transparency readings. Sixty-four soil samples, 160 plankton samples, and 75 collections of bottom organisms were secured. Temperature series in the deeper portions of the lake showed many reading below 4° C., the temperature at which fresh water reaches its greatest density. Bottom temperatures in localities more than 150 meters deep usually showed a tendency to run slightly less than 4° C. The lowest temperature obtained during the season occurred in 220 meters, 32 miles W. ½ S. of Manistee, Mich., where a reading of 3.6° C. was obtained.

A study of the surface currents of Lake Michigan as determined by drift bottles was begun on June 17 and continued until August 17. Some 283 bottles were set adrift during these two months, usually in transverse series across the lake. The bottles of a series were released at intervals of approximately 2 miles. The southernmost series extended from Chicago to St. Joseph, Mich., and the northernmost from Frankfort, Mich., to Kewaunee, Wis. Of the 283 bottles set adrift, 180 have been recovered to date, or a percentage recovery of 63.6.

The majority of the drift bottles recovered showed a tendency to move northward, which was to be expected because of the prevalent southwesterly winds. It is planned to continue these studies during the summer of 1932.

## DEEP TRAP NETS OF LAKES HURON AND MICHIGAN

A new cooperative investigation, separate from that on the chub net, was started with the States of Michigan and Wisconsin on the deep trap nets. In June, 1929, the deep trap net was introduced in Lake Huron at Port Hope, Mich., primarily for the purpose of taking whitefish. During the past two years this type of gear has spread very rapidly throughout Lake Huron and upper Lake Michigan, including Green Bay. A deep trap net is virtually a submerged pound net, since it has lead, a heart, a tunnel, and a pot or crib. The crib where the fish are finally captured is entirely inclosed so that the entire net can be completely submerged. The crib varies from 18 to 35 feet in depth, 30 to 40 feet in length, and in width usually tapers from 24 feet at the front to 20 feet at the back, and the lead varies in depth from 25 to 45 feet. This net is usually fished at depths varying from 60 to 125 feet, although it can be fished at greater depths.

The principal criticisms heard regarding deep trap nets are that they take too many adult whitefish, thereby depleting the stock in the lake and glutting the market, and that they destroy too many undersized fish. The States of Michigan and Wisconsin and the fishermen are deeply concerned about the rapid spread of these nets throughout the Great Lakes and have therefore urged the bureau to make a study of their action upon the fish stock. The patrol boats of the conservation departments of both States were placed at the bureau's disposal in the preliminary surveys.

The survey in Wisconsin waters was completed during the period July 6 to 16, 1931, and a report, including a set of recommendations, was submitted by the joint commission. The survey in Michigan waters was carried on from July 24 to October 21, 1931, out of the following ports: Bay Port, East Tawas, Oscoda, Ossineke, Alpena, Rogers City, Cheboygan, Epoufette, Naubinway, Manistique, and Fairport. The Conservation Department of Michigan furnished one assistant for this work and all transportation. In view of the great importance of the study and of the many complications involved, it has been deemed advisable to continue the investigation another year before drawing up final recommendations.

## STUDIES IN LAKE ERIE

*Fishery investigations.*—The spring of 1931 saw the completion of our experimental fishing with trap nets on Lake Erie begun in the fall of 1927. The report for 1930 referred to the study of the fishing characteristics of one of our experimental trap nets. This particular study was carried on at Lorain, Ohio, in 1930 for various species of fish, excluding the sauger, a species relatively unimportant in the commercial catch at Lorain. Since the only remaining principal objection of the commercial fishermen to the introduction of our experimental trap net for commercial fishing on Lake Erie was that too many legal saugers would be released by it (it is asserted that the sauger is the most active of the Great Lakes commercial species of fish and would escape from a net which would retain other less active species), it was deemed desirable to resume the experi-

ments of 1930 at Sandusky, Ohio, on sauger grounds and during the sauger run in the spring of 1931.

Accordingly two investigators were detailed at Sandusky and carried on these experiments during the period March 12 to May 20, 1931. Length and weight measurements were secured for some 33,500 fish, including perch, saugers, and yellow and blue pike. It was found that though the percentage of legal fish released by our experimental net was greater in the case of the sauger than in the case of any other species studied, yet the benefits secured by the release of illegal fish would vastly compensate the fishermen for the loss of any legal fish. On the basis of our experiments we expect to recommend to the State of Ohio that the lifting crib of all trap nets be provided with a large mesh (not less than 3 inches as used) in the back and in one-third (or for a distance of not less than 3 feet) of the sides, top, and bottom adjacent to the back, and with a small mesh (not more than 2 inches as used) in the remaining two-thirds of the crib, including the tunnel.

In addition to the field work, much has been accomplished in the laboratory in a study of the life history of the yellow and blue pike perch, the sauger, the yellow perch, the whitefish, and the cisco of Lake Erie. The data for these studies were collected during our investigations of experimental fishing gear.

*Limnological studies.*—No field work was done in 1931 on the limnology of Lake Erie, but the time of one investigator was devoted entirely to the compilation of data collected over a period of five years and to the preparation of the final report. As stated in previous reports, the limnological investigation of western Lake Erie was carried on by the Ohio Division of Fish and Game, in cooperation with the bureau, under the immediate supervision of Dr. Stillman Wright. The principal objective was to determine the degree and extent of pollution and the effect of pollution on conditions of existence in the lake. The problem was attacked by making nearly simultaneous studies of the chemistry, plankton, and bottom organisms in the open lake, far from sources of pollution, and at the mouths of important rivers.

Conditions in the open lake were found to be apparently normal. The only evidence of pollution was the occasional presence of *B. coli.* At the mouths of the Maumee and Raisin Rivers there was considerable chemical evidence of pollution. However, the zones of oxygen depletion and carbon dioxide increase were limited to a small area in each case. Large amounts of soluble nitrogen compounds were added to the lake by the Maumee River. There was no oxygen depletion at the mouth of the Detroit River and the nitrogen content was low because of the great volume of water in this river compared to the volume of sewage added to it.

Maumee Bay was found to be a center of production for both phyto- and zooplankton. The plankton crustacea were nearly twice as abundant here as in the open lake, and more than fifteen times as abundant as at the mouth of the Detroit River. The abundance of plankton in Maumee Bay is presumably the result of the large amount of nitrogen compounds available. The paucity of plankton at the mouth of the Detroit River is explained by the facts that Lake

St. Clair is plankton poor and that there is no opportunity for production in the river itself.

In the open lake the principal bottom organism was the mayfly, Hexagenia. Near the mouths of the rivers this form was replaced by tubificid worms, which are recognized as highly tolerant to pollution. Using the number of worms as a criterion, the polluted area was divided into zones of heavy, moderate, and light pollution. Heavy pollution was found only at the mouths of Maumee and Raisin Rivers, and the total area involved was roughly 10 square miles. Moderate pollution was found also at the mouth of Detroit River; the combined area for the three rivers was approximately 20 square miles. Because of the accumulations of decaying organic matter in these two areas of heavy and moderate pollution, they can not be considered highly suitable for spawning grounds of fish. The combined area of the zones of light pollution was roughly 75 square miles. It is believed that the major part of this zone includes a substratum suitable for spawning purposes.

The undesirable effects of pollution have been contamination of the water by sewage bacteria and the reduction of spawning areas, but the harm done to the commercial fisheries by reduction of spawning areas has no doubt been offset, at least in part if not entirely, by the increase in plankton, which serves as food for young fish and for the adults of plankton-feeding species.

### LAKE CHAMPLAIN

The chief objective of the Lake Champlain investigation was to determine the effect of commercial seining in Missisquoi Bay by Canadian residents on the abundance of pike-perch in the United States waters of the lake. It was believed that the series of public hearings held by the International Fact-finding Commission at Plattsburg, N. Y., Swanton, Vt., and Phillipsburg, Quebec, on October 15, 16, and 17, respectively, would complete the field work; but after a conference at Phillipsburg, Quebec, of the State and Provincial officials involved, it was found necessary to collect additional data, with special reference to sexual maturity of yellow pike-perch and the abundance of whitefish in Vermont waters. In cooperation with the State of Vermont, Doctor Van Oosten carried on the necessary seining experiments at Larrabees Landing and its vicinity during the period October 26 to November 16, 1931. Most of the data collected previously during this investigation have been analyzed in the laboratory; and as soon as other duties permit, the final report with recommendations will be submitted by the commission.

## WISCONSIN LAKE STUDIES

### STUDIES OF FISH GROWTH

The investigations of the lakes of northeastern Wisconsin which the bureau conducted in cooperation with the Wisconsin Geological and Natural History Survey in 1927, 1928, and 1930 were continued through 1931. During the months of July, August, and early September Dr. Ralph Hile, of the bureau, and Edward Schneberger, of

the Wisconsin survey, with the aid of two assistants, collected data for growth study from 7,764 fish. These collections were made from six "type" lakes in which the growth rates of the perch, rock bass, and cisco are being studied. The policy of distributing scale envelopes to sport fishermen for the purpose of obtaining data on the game fish of the region was continued.

Since preliminary study indicated the possible existence of distinct races of ciscoes in the different lakes, a total of 720 specimens from five lakes were preserved for purposes of morphometric study.

The question of the existence within a single lake of local races having different growth rates was attacked from two angles. In Muskellunge Lake, which has a rather complex basin, collections of scale material were made in two widely separated bays. In the same localities 1,400 rock bass, bluegills, and perch were tagged. Since the tagging operations were conducted late in the season, the recoveries were not numerous. It is hoped that later recoveries may lead to conclusive results on the question of the extent of the wanderings of these species within the lake.

## COOPERATIVE LIMNOLOGICAL INVESTIGATIONS

Physical, chemical, and biological studies of several of the lakes of northeastern Wisconsin were continued in the summer of 1931. The Trout Lake Laboratory of the Wisconsin Geological and Natural History Survey was opened on June 28 and the investigations continued until September 10; the fish work extended to September 18. These studies are entirely supervised and largely financed by the survey; but, in recognition of the bureau's modest cooperation, the following report is submitted by Prof. Chancey Juday and, because of its interest in relation to hydrobiological and aquicultural research in which the bureau is engaged, is published here.

The field party consisted of E. A. Birge, C. Juday, Edward Schneberger, F. H. Couey, S. X. Cross, George E. Burdick, J. B. Goldsmith, H. C. Baum, and K. A. Siler, biologists; F. L. Taylor, chemist; and W. L. Hafner, part-time surveyor and cartographer. In addition, Leslie Titus was employed in making chemical analyses of the lake residues in the chemical laboratory of the University of Wisconsin during the summer. The staff of the Bureau of Fisheries that took part in these cooperative investigations consisted of R. O. Hile, H. M. Field, and William Duden.

With the exception of the work on the transmission of solar energy by these lake waters, the investigations were confined chiefly to the six lakes that were selected for an intensive study of their fish fauna. Observations on solar-energy transmission were made on a number of other lakes, representing various types, in addition to those that were made on the six lakes selected for the fish studies.

A more sensitive reading instrument was used during the summer of 1931 for the observations on solar-energy transmission through these lake waters, so that it was possible to obtain results at greater depths. With the present galvanometer readings can be taken where the amount of solar energy is only about 0.001 per cent of that delivered at the surface of the lake. The results obtained at these greater depths serve to give a much better picture of the light and turbidity conditions in the lower strata of some of these lakes, and their relations to the photosynthesis that takes place in the deeper water. By the use of color screens, also, it is now possible to determine the quality as well as the quantity of light at different depths.

Excess oxygen produced by chlorophyll-bearing organisms has been found in a few of these lakes down in the region of the thermocline and the upper part of the hypolimnion, and these solar-energy observations have a direct bearing

upon the problem of photosynthesis in these strata as well as in the deeper water. In Crystal Lake, for example, abundant growths of the moss *Drepanocladus adunous* var. *aquatious* are found on the bottom at depths of 18 to 21 meters, and similar growths of this plant are found in Weber Lake at depths of 11 to 13.5 meters. Such growths of plant material at these depths raised the question of the amount of solar energy present there for the process of photosynthesis. A number of observations taken in different years and at different times during the summer show that from 1 to almost 4 per cent of the solar energy that is delivered to the surface of the lake penetrates to a depth of 20 meters in Crystal Lake, while nearly 2 per cent reaches a depth of 13 meters in Weber Lake. These amounts of energy seem to be sufficient to enable this moss to carry on photosynthesis and grow profusely at these depths in spite of the fact that the summer temperature of the water varies from 7° to 12° C. at 18 to 20 meters in Crystal Lake, and from a little less than 9° to 15° at 13 meters in Weber Lake in the different years.

A stratum of water possessing an excess of dissolved oxygen was found in Silver Lake on August 28, 1931, and this excess represented oxygen that had been liberated in this region through the photosynthetic activities of the phytoplankton. The quantity of dissolved oxygen at 9 meters on this date was 13.2 milligrams per liter, which was equivalent to 127 per cent of saturation, and there was also a slight excess at 10 meters. Solar-energy readings taken during the summer showed that about 1¼ per cent of the amount of energy delivered to the surface of the lake penetrated to a depth of 9 meters and somewhat less than 1 per cent reached 10 meters. These results seem to indicate that the phytoplankton as well as the moss Drepanocladus are able to carry on the process of photosynthesis in the lower strata of a lake when the solar energy is reduced to about 1 per cent of the amount delivered to the surface.

Regular observations were made on the temperature and dissolved gases of the six lakes selected for the fish studies. Dissolved oxygen determinations were made for the purpose of obtaining some idea of the most suitable strata for fishing operations in the various lakes; this was true especially in Muskellunge, Nebish, and Silver Lakes, where there is a paucity of oxygen in more or less of the hypolimnion during the summer period of stratification. The general results of such analyses have been incorporated in previous reports, so they may be omitted here.

Some chemical determinations were made on the waters from about a hundred wells and springs situated in the vicinity of the various lakes. These analyses were made for the purpose of obtaining a comparison between the quantity and quality of the substances held in solution by the ground waters and those found in the neighboring lake waters. The general results of these analyses show that the ground water is "softer" than that of the neighboring lake in some instances, in other cases the two are about the same, while in still others the ground water is "harder" than the lake water. Further work on this problem will be necessary before any definite conclusions regarding the relationship between ground and lake waters in this district can be reached. Residues from about a hundred wells and springs were secured during the summer, and further analyses of them will be made at the first opportunity for such work.

The biological work consisted of (*a*) a quantitative study of the plankton of the six selected lakes, (*b*) a quantitative study of the bottom fauna of these lakes, (*c*) a qualitative and quantitative study of the food eaten by the fish, and (*d*) a study of the internal parasites of the fish. Material was also collected for an investigation of the rate of growth of the different species of fish that are found in the various lakes.

Muskellunge Lake yielded the largest average standing crop of plankton organic matter and Clear Lake the smallest, 1.15 grams per cubic meter and 0.58 gram, respectively. The volume of Silver and Weber Lakes has been determined, so that the average standing crop of the entire lake may be computed for them. For Silver Lake the average amount of dry organic matter in the standing crop of plankton was a little over 10,000 kilograms, which was equivalent to somewhat more than 100,000 kilograms of living material; the dry weight represented 115 kilograms per hectare of surface, or 102 pounds per acre, while the living weight was approximately ten times as large.

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In Weber Lake the average amount of dry organic matter in the standing crop of plankton was 930 kilograms, which was equivalent to about 9,300 kilograms of living material; these amounts represented 60 kilograms of dry organic matter per hectare, or about 600 kilograms of living material per hectare, which were equivalent to 54 and 540 pounds per acre, respectively. The average standing crop of plankton in Weber Lake was only a little more than 51 per cent as large as that of Silver Lake on the basis of unit area.

Quantitative and qualitative studies of 676 bottom samples were made during the summer. The general survey of the bottom population was completed for five of the lakes, namely Clear, Muskellunge, Nebish, Silver, and Weber; owing to the large size of Trout Lake, much more time will be required to make an adequate survey of its bottom-dwelling animals. One of the interesting facts brought out in the survey was the comparative abundance of the bottom population in the shallow water where the bottom consisted of well-compacted sand and gravel. Such a substratum is generally regarded as unfavorable for insect larvæ, oligochaets, and other macroscopic bottom forms, but on these sandy and gravelly areas the macroscopic population ranged from 100 to more than 4,000 individuals per square meter. In the deeper water where the bottom consisted of mud, or a mixture of mud and sand, the number of individuals varied from none up to a maximum of about 9,000 per square meter. A considerable number of samples from the deepest portions of these lakes did not contain any macroscopic organisms, but all of the shallow-water samples contained at least a few organisms. The chief constituent of the bottom population, both in the shallow water and in the deeper areas, consisted of chironomid larvæ. Snails were especially abundant in some of the shallow-water areas.

The stomachs of 3,000 fish were examined for their food content. Of this number approximately 1,000 were found to be empty, leaving 2,000 specimens for analysis. Among those containing food material, there were 725 perch, 470 rock bass, 233 bluegills, and 273 ciscoes; the others consisted of game fish, minnows, and suckers.

The following table gives the average percentage of the more important items found in the stomach contents of the 725 perch.

| Item | Average percentage |
|---|---|
| Caddis-fly larvæ | 22.0 |
| Fish | 12.3 |
| Cladocera (chiefly Daphnia) | 8.5 |
| Hexagenia larvæ | 7.5 |
| Chironomus larvæ and pupæ | 6.5 |
| Crayfish | 4.8 |
| Amphipods | 3.6 |
| Plant material | 3.4 |
| Total in 8 items | 68.6 |

The eight items included in the table constituted a little more than two-thirds of the total stomach contents, while a little more than one-third consisted of caddish-fly larvæ and fish. Cladocera ranked third in importance. In addition to the above figures, it may be noted that 7 small perch of the 1931 brood contained 56 per cent Cladocera and 41 per cent Copepoda.

The stomachs of the 470 rock bass contained the following percentages of material.

| Item | Average percentage |
|---|---|
| Dragon-fly larvæ | 11.0 |
| Chironomus larvæ and pupæ | 9.8 |
| Fish | 8.9 |
| Hexagenia larvæ | 7.8 |
| Crayfish | 7.6 |
| Caddis-fly larvæ | 5.2 |
| Plant material | 5.0 |
| Snails | 2.5 |
| Total in 8 items | 57.8 |

The results for the 233 bluegill stomachs were as follows:

| Item | Average percentage |
|---|---|
| Plant material | 25.7 |
| Chironomus larvæ | 22.0 |
| Ants | 11.5 |
| Snails | 9.7 |
| Hexagenia larvæ | 5.1 |
| Amphipods | 2.8 |
| Total in 6 items | 76.8 |

These results indicate that the bluegills are much more restricted in their diet than either the rock bass or the perch. The 6 items listed in the table constituted 76.8 per cent of the food material found in the bluegills as compared with 57.8 per cent for 8 items in the rock bass and 67.6 per cent for the 8 items in the perch. The large percentage of plant material found in the stomachs of the bluegills is also an important difference; it amounted to 3.4 per cent in the perch, 5.0 per cent in the rock bass, and 25.7 per cent in the bluegills.

The menu of the 273 ciscoes was still more restricted, as indicated in the following table:

| Item | Average percentage |
|---|---|
| Cladocera | 45.6 |
| Copepoda | 32.8 |
| Corethra larvæ | 2.1 |
| Chironomus larvæ | 1.8 |
| Total in 4 items | 82.3 |

Two items, namely, Cladocera and Copepoda, make up more than 78 per cent of the food material of the ciscoes. In 67 ciscoes obtained from Clear Lake, 96.4 per cent of the food consisted of Daphnia. This table shows that there is very little competition for food material between the ciscoes and the other three species enumerated above.

During the summer 2,643 fish from the various lakes were examined for internal parasites. The perch were rather heavily infested in four of the five lakes from which specimens were examined in considerable numbers. The flesh and digestive organs of only 195 out of 652 perch were negative, and 164 of those that were negative came from Weber Lake. Excluding those from Weber Lake, only 6 per cent of the specimens from the other four lakes gave negative results. No explanation of the very small percentage of infestation in the Weber Lake perch has been found so far; only 11 specimens out of 175 harbored parasites. It may be mentioned in this connection that 7 specimens of smallmouth black bass from Weber Lake also gave negative results. A small trematode larva was found in the eyes of 96 per cent of the perch from Trout Lake, in 98 per cent of those from Muskellunge Lake, and in 100 per cent of those from Nebish and Silver Lakes.

The flesh and viscera of the rock bass yielded a high percentage of parasites; the infestation varied from 88 per cent in Trout Lake to 100 per cent in Nebish and Silver Lakes. The small trematode larva was found in the eyes of only 30 per cent of the rock bass from Silver Lake, but this infestation reached 90 per cent in Muskellunge Lake and 100 per cent in Nebish and Trout Lakes.

Trematode larvæ were found in the viscera of all of the bluegills (180 specimens) from Muskellunge Lake, and 20 per cent of them also had cestode cysts; 92 per cent of them had trematode larvæ in their flesh, and 60 per cent had trematode larvæ in their eyes.

Thirty ciscoes from Silver Lake were examined for parasites, and cestodes were found in the intestines of all of them; 80 per cent of them also had Acanthocephala. In Muskellunge Lake 80 per cent of the ciscoes contained cestodes and 20 per cent were free of visceral parasites. In Trout Lake 16 per cent were negative, 82 per cent had cestodes in their intestines, and 10 per cent also had Acanthocephala. The ciscoes from Clear Lake, on the other hand, were 96 per cent negative; only 2 specimens out of 60 examined yielded any parasites. These fish were found to be feeding almost exclusively on

Daphnia, and this may be partly responsible for the very small parasite infestation. Clear Lake also has very soft water, and the snail population, as a result, is relatively small, so that the danger of parasite infestation from this source is correspondingly small. Weber Lake also has soft water and a comparatively small snail population, and this may account, in part at least, for the small number of parasites found in the perch of that lake.

In the investigations relating to the growth of the perch in the northeastern lakes, Edwin Schneberger has read and measured the scales of about 3,000 specimens, from which rates of growth have been computed.

In June, 1931, the following papers relating to the investigations made on Wisconsin lakes appeared in Volume XXVI of the Transactions of the Wisconsin Academy of Sciences, Arts, and Letters.

1. A third report on solar radiation and inland lakes. E. A. Birge and C. Juday.
2. A second report on the phosphorus content of Wisconsin lake waters. C. Juday and E. A. Birge.
3. Copepods parasitic on fish of the Trout Lake region, with descriptions of two new species. Ruby Bere.
4. Leeches from the lakes of northeastern Wisconsin. Ruby Bere.
5. Note on the determination of total phosphorus in lake water residues. Leslie Titus and Villiers W. Meloche.

## PACIFIC COAST AND ALASKA FISHERY INVESTIGATIONS

On May 22, 1931, the personnel and equipment of the Stanford University field station of the Bureau of Fisheries were transferred to the new Fisheries Biological Laboratory at Seattle, Wash. All of the bureau's biological investigations, dealing with Pacific coast fishery problems, except those relating to shellfish and the cooperative work on California trout, are now being carried on at this station.

The laboratory building of this new station is constructed of brick and is fireproof throughout. It has three full stories and contains 29 offices for individual workers. The lower floor is taken up with storerooms, photographic dark rooms, the heating plant, a room which can be kept at constant temperature for the storage and space for working on fresh or preserved specimens. The second floor consists entirely of offices. The third floor is composed of additional offices, two chemical laboratories, a fireproof room for the storage of valuable data and a large library. Connections for gas, hot and cold water, steam, compressed air, and vacuum are available in virtually all of the individual offices, so that they may be converted readily into experimental laboratories whenever the need occurs.

The staff of investigators of the International Fisheries Commission, United States and Canada, is occupying quarters in the building at present, and offices for a statistical agent and a technologist and one of the chemical laboratories has been fitted up for use of the division of fishery industries.

### ALASKA RED SALMON

*Karluk red salmon.*—Marking experiments were continued at Karluk, Alaska, during 1931 for the purpose of determining if possible the mortality of the red salmon while the fish are in the salt water and also to provide a check on the readings of the salt-water growth taken from the scales. Fifty-five thousand red-salmon fingerlings were marked as they were migrating to the sea. The commercial

catch was sampled for the return of fish marked in 1928, 1929, and 1930.

In 1930, 55,000 migrants were marked, 50,000 by the removal of one ventral fin and the adipose fin and 5,000 by the removal of the right pectoral fin and the adipose fin. This was the first time the pectoral mark had been used at Karluk. The first returns from this marking appeared this year, and it is of interest to note that the returns of fish marked by the removal of the right pectoral fin and the adipose fin were comparable to the returns of the fish marked by the removal of one ventral fin and the adipose fin; therefore, it appears that the use of this mark will prove to be satisfactory.

The study of the returns from known escapements of spawning salmon was continued. The run of 1931 was, for the main part, the return from the brood year of 1926. The escapement of 1926, 2,500,000 fish, was the greatest escapement of red salmon into Karluk River of which we have any record; and had conditions on the spawning grounds been favorable, a very large run in 1931 undoubtedly would have been produced. The run in 1931 was, however, only fair. That conditions on the spawning grounds were not favorable was noticed by observers in 1926, and their observations were included in the first Karluk report, "Investigations concerning the red salmon runs to the Karluk River, Alaska," by Charles H. Gilbert and Willis H. Rich, in which it was stated in regard to the low water in the Karluk River watershed, "* * * Just what effect this will have on the success of the spawning is problematical; it may be slight or it may be great enough to offset in considerable measure the effect of the fine spawning escapement * * *."

We have, then, two brood years which are somewhat comparable—1924 and 1926. In 1924 the red-salmon escapement was about 1,000,000 fish and the pink-salmon escapement was estimated at over 4,000,000 fish, the pink salmon occupying to a great extent the same spawning grounds as the red salmon. The spawning beds were so crowded, due to the very large escapement, that the result of the spawning was poor. Only a few thousand pink salmon returned to Karluk in 1926 from the spawning escapement of over 4,000,000 fish, and the return of red salmon from this brood year was less than 1 to 1. Overcrowding on the spawning grounds was undoubtedly the chief cause of the poor returns.

The summer of 1926 was unusually dry at Karluk, resulting in a lowering of the level of the spawning streams entering into Karluk Lake and also a lowering of the level of the lake itself. Thus the area of the spawning beds was reduced, and the good escapement of 2,500,000 red salmon caused overcrowding on the spawning grounds. Both in 1924 and 1926 there was noticeable overcrowding, and in both cases the return from the spawning escapement was less than 1 to 1. We are faced, then, with the evidence that too large an escapement is just as unfortunate as too small an escapement.

It must be pointed out here, however, that the evidence can not be interpreted to mean that every time there is an escapement of 2,500,000 red salmon into Karluk River that there will be a poor return, for if climatic conditions at Karluk Lake had been normal in 1926, the spawning grounds would not have been overcrowded.

Three trips were made to Karluk Lake to obtain limnological data and to observe conditions on the spawning grounds. This investigation has been conducted under the general direction of Dr. Willis H. Rich, of Stanford University.

*Chignik red salmon.*—The season of 1931 proved to be very favorable for the investigation of the red-salmon runs at Chignik, Alaska, which Harlan B. Holmes and assistants have been conducting for the past four years. The run of mature fish, amounting to approximately 1,500,000, was sufficient to permit fishing by the greater part of the traps throughout the season. As a result of this condition it was possible to collect numerous data for age analysis of the run and to study the adequacy of sampling. During the two preceding seasons studies of sampling were undertaken, but a poor run in 1930 and the dominance of a single-age class in 1929 made these attempts of little value. The run of 1931 was very favorable, not only as a result of continuous fishing but also as a result of a good representation of at least four age classes. A preliminary study of the data has shown an orderly progression of runs of the several age classes, the fish of a single class starting with few individuals, gradually increasing to a maximum of abundance, then gradually declining until it finally disappears. The overlapping of two or more such independent runs gives the general run a complex and constantly changing age composition. This complexity apparently is increased by the existence of two independent races of red salmon supported by the spawning grounds of the two lakes in the Chignik system. Each of these two races is represented by the four age classes, making a total of eight such classes to be considered in the analysis of the run.

Comparison of the catches of traps on the two sides of Chignik Bay, separated by a distance of approximately 6 miles, shows that traps on one side catch a significantly greater proportion of larger and older fish than those on the other. The reason for this difference is not apparent unless it be that the fish of different ages tend to follow opposite shores of the bay. This evidence of selective fishing further increases the needs for extensive sampling.

Observations of the young fish in fresh water were continued in 1931. Samples of migrants and lake residents were collected at frequent intervals. Approximately 70,000 of the seaward migrants were marked by the removal of fins.

The problem of independent races is proving to be very important at Chignik. It was at first supposed that the spawning fish scattered at random over the entire spawning area and that as a result the entire population represented a single race. More recent observations indicate that the two lakes support separate groups, or races, of fish. Those fish whose parents spawned in the tributaries of one of the lakes seem to return to that lake to spawn, thus perpetuating the independence of the two races. The two races seem to have different habits; for example: One starts its spawning migration earlier in the season. These racial differences probably are responsible for a great part of the complexity of the problems encountered at Chignik. Special attention is to be given to the races during the next field season.

*Copper River red salmon.*—An investigation of the red-salmon runs of Copper River, Alaska, has been continued by Seton H. Thompson,

assisted by Morris Rafn. This work has been directed toward securing a knowledge of the age groups represented in the runs and their relative importance, the time at which fish bound for the various widely separated spawning grounds pass through the commercial fishery at the delta, and the present condition of the fishery.

A scale study has revealed that the red salmon of the Copper River mature at various ages ranging from 3 to 7 years and live for one to four winters in fresh water before the time of their seaward migration. Only 3 of the 11 age groups represented have been of significance in any of the recent runs. Of these, the fish maturing in five years, which have spent two winters in fresh water, have been the predominating age group. The relative importance of these age groups has changed with some degree of regularity during each season.

For the purpose of determining the time at which the salmon that spawn in the different tributaries pass through the gill-net fishery at the delta, records have been obtained of the daily catch by the commercial fishery at the river mouth, by the Indian fish wheels distributed along the entire length of the river, and by gill nets operated in some of the more important tributaries. The runs, so obvious at the mouth of the river, may be traced to their ultimate destination by this method, and regulations may be promulgated to provide adequate seeding of each spawning area. The collection of uniform statistics has been facilitated by the use of forms prepared for that purpose.

In connection with these observations data have been collected which are designed to show whether or not the salmon utilizing distinct spawning areas of the Copper River develop physical characteristics by which they may be distinguished. The analysis of these data is not yet complete.

An effort has been made to determine the extent of the spawning beds of the river and its tributaries. With this proposition in view, the seeding of the known spawning localities is observed annually. Much of the river system, because of the difficulty of access during the summer months, has not been explored and new spawning areas are being discovered each year.

*Bristol Bay red salmon.*—A. C. Taft, who was formerly in charge of the Bristol Bay red-salmon investigation, was transferred to other work during the latter part of 1930. T. L. Schulte carried on the necessary field work in this locality during the summer of 1931.

A very extensive collection of downstream red-salmon migrants was secured from Aleknagik Lake, its tributaries, and Wood River. Total length and body measurements have been made of these specimens and samples of the scales have been mounted. These data upon analysis should yield much information regarding the early life history of the red salmon of the Wood River and its tributary lakes and streams.

Scale samples were also collected from adult red salmon caught both in the Wood River system and in the commercial fishery in Bristol Bay itself. Trips of inspection were made to the other principal fishing areas in Bristol Bay.

## ALASKA PINK-SALMON INVESTIGATIONS

This investigation is concerned with the study of the life history of the pink salmon (*Oncorhynchus gorbuscha*). During the past year the following experimental studies were pursued under the supervision of Dr. F. A. Davidson:

*Application of "parent stream" theory to life history of pink salmon.*—The experiments underlying this study consist of marking pink-salmon fry from a given stream as they leave the stream by means of clipping the dorsal and adipose fins from their backs. This is followed by a careful observation of the adult pink salmon, returning to the stream two years later to search for individuals bearing the marks. These experiments were started in the spring of 1930 at the Duckabush (Wash.) hatchery on Hood Canal, where 36,000 pink-salmon fry were marked. In the fall of 1931 the pink salmon that returned to other streams on the canal, as well as those returning to the Duckabush River, were observed for adults bearing the marks. Eight adult pink salmon, consisting of males and females, showing both dorsal and adipose marks were found in the Duckabush River. One adult female was found in the Hamma Hamma River, located just north of the Duckabush River, and one adult male was found in the Docewallips River, just south of the Duckabush River, both of which showed both dorsal and adipose marks. An examination of the scales of these marked salmon showed that the time of their return as adults coincided with their age indicated by the checks on their scales.

In the spring of 1931, in Snake Creek, at Olive Cove, Alaska, 50,000 pink-salmon fry were marked by means of clipping their dorsal and adipose fins. These fry are expected to return in the fall of 1932. The marking experiments in Alaska are being supplemented by racial analysis of the pink salmon in the streams in which fry are marked. During the summers of 1930 and 1931 the pink salmon in Snake Creek and the pink salmon in Anan Creek, a neighboring stream, were studied from the racial standpoint.

*Variation in time of appearance of pink-salmon runs in southeastern Alaska.*—Through the courtesy of the salmon packers operating in southeastern Alaska, the bureau secured the records of the daily pink-salmon catches of a large number of salmon traps located in the various fishing districts throughout the territory. These records in general cover a period of time from 1908 to 1930, inclusive, and are believed to be representative of the changes that have been taking place in the status of the fishery.

Since the salmon traps are stationary units of gear and more or less permanently located, it was assumed that the time of appearance of the pink-salmon runs in any district would be indicated by the time in the fishing season the pink-salmon catches were made by the salmon traps located in the district. With this assumption in mind, a statistical analysis was made of the daily pink-salmon trap-catch records of the salmon traps located in each fishing district in the territory for the purpose of ascertaining variations in the time of run.

A similar analysis of the daily pink-salmon packs of a southeastern Alaska cannery showed that from 1895 to 1909 the pink-salmon runs were much later than they are at the present time. In

looking over Reports of the Commissioner of Fisheries for these years, numerous references were found concerning the enormous quantity of pink salmon in the territory. Following this period the total yearly packs of pink salmon increased rapidly in the Territory, and it was then that the runs began to come in early. They reached their earliest stage between the years 1914 and 1918, after which their appearance has been increasingly retarded. According to the Reports of the Commissioner of Fisheries, the fishing regulations were enforced more and more effectively after 1918 and, with this increased protection, the pink-salmon runs began to build up. This recuperation of the pink-salmon runs is evidenced by the increase in the average total catches of the traps in a number of fishing districts during this period.

It appears that from 1895 to 1909, when the pink-salmon population in the Territory was at its maximum, in so far as there is a record, the pink-salmon runs were much later than they are at the present time. Then, from 1909 to 1918, when exploitation of the runs was very intensive and the salmon population was greatly reduced, the runs became early. Finally, when the Bureau of Fisheries began to enforce the fishing regulations more effectively and impose more adequate regulations in 1924, the pink-salmon population began to build up and at the same time the runs started to come in later in the fishing seasons. In other words, there seems to be a significant relationship between the size of the pink-salmon runs and the time of their appearance in the fishing seasons.

## STATISTICS OF THE ALASKA SALMON FISHERIES

Compilation and analysis of the statistics of the Alaska salmon fisheries has been continued by Dr. W. H. Rich and E. M. Ball, of the Alaska division. A second part of this series was published during the past year and covered the district from Chignik to Resurrection Bay. Part 3, which covers the Prince William Sound area and the Copper and Bering Rivers, has been completed and will be published in the near future. Much of the preliminary work has been done on part 4, which will cover southeastern Alaska and will complete the study of the statistics from the inception of the industry up to and including the season of 1927, from a standpoint of total-catch records.

## ALASKA HERRING

In September, 1931, a scientific report was submitted to the bureau for publication by Dr. George A. Rounsefell, in charge of the herring investigation, and Edwin H. Dahlgren, showing the fluctuation in the abundance of herring in the Prince William Sound region of Alaska. The herring fishery of this region has been marked by fluctuations in the abundance, size, and quality of the fish, which have caused heavy losses to the operators. The stabilization of the yield of this fishery is an important economic problem. This report shows clearly that these changes in abundance are caused by inequality in the numerical strength of the annual increments to the population proceeding from each year class and by insufficient numbers of older fish, owing to a too intensive fishery.

The availability of the herring in different portions of the season was carefully analyzed and tables computed showing what percentages of the total catch is taken in each 10-day period. This knowledge is essential, since the amount taken during such a period varies materially through the season. Knowing these figures, it is possible to reduce the total catch any desired percentage by means of closed seasons. The extreme localization of the fishing grounds is shown by an analysis of the catches for eight years (1923 to 1930, inclusive). During this time 50.7 per cent of the total catch was taken in the waters contiguous to the southern end of Evans Island, 46.6 per cent from other restricted localities, and 2.7 per cent from all of the remainder of the immense area of Prince William Sound.

In attempting to discover if these various areas supported independent populations, it was found that the means of the number of vertebræ for various year classes of herring differed significantly. Comparing vertebral-count samples of the same year class only (to allow for annual variations in temperature), it was found that the herring populations of McClure Bay and MacLeod Harbor each seem to differ from the remainder of the herring of Prince William Sound.

Body-length frequencies of the herring from Prince William Sound were available for seven years (1924 to 1930) and age frequencies for six years (1925 to 1930). These length frequencies show clearly the progression, year by year, of size modes, due to the growth of fish of dominant year classes. The year classes are so unequal in abundance that one or two year classes usually constitute the bulk of the catch even though several are represented. Thus the 1926 year class, which was unusually abundant, constituted 78.2 per cent of the catch in 1928, 93.3 per cent in 1929, and 87.5 per cent in 1930.

The fluctuations in the catch caused by these dominant year classes are of great importance to the fishery. During the intervals when no abundant year classes of young fish are present the fishery must be supported by a reserve of the older age groups. Depletion of these older age groups by a too intensive fishery seems to have caused the variations in yield which characterize the fishery during the past few years. Unless protection is adequate to insure a sufficient quantity of older age groups at all times, the fishery can not be maintained without such undesirable fluctuations. In order to insure such a supply of older fish it was recommended that a 48-hour weekly closed season be put into effect, and that the purse seines be reduced from 180 to 150 fathoms in length.

The field work of the herring investigation has been aided very materially by the purchase of a motor vessel in July, 1931, which provides comfortable living quarters and laboratory space. Using this vessel, racial samples were obtained for the first time from Saginaw Bay in Frederick Sound, Gut Bay in Chatham Strait, Point Lull at the eastern entrance to Peril Strait, Point Augusta in Icy Strait, and Anita Bay in Zimovia Strait. Samples of fish for vertebral counts totaling 13,900 are now available from over 40 localities in southeastern Alaska. All of the ages of these herring have been read, and an analysis is now being made of the numbers of vertebræ to determine their racial significance.

The usual annual samples were collected from Prince William Sound. In the Aleutian Islands district Marcus W. Meyers preserved gill-netted samples from Dutch Harbor, and additional frozen samples of purse-seined herring were obtained from Lost Harbor on Akun Island.

### PUGET SOUND SOCKEYE SALMON

During 1931 an investigation of the sockeye-salmon fishery of Puget Sound was started under the direction of J. A. Craig, with the intention of solving the following problems: (1) Devising a reliable index to the relative annual abundance of the sockeye salmon in Puget Sound during the past 20 years; (2) the discovery of whether or not regular fluctuations exist in each fishing season from year to year in abundance of the sockeye salmon, and if such fluctuations do occur at what dates they take place; (3) ascertaining whether or not distinguishable races of sockeye salmon pass through the Puget Sound fishery, and if so, at what regular dates during the fishing seasons these racial migrations take place. Since the great majority of the sockeye salmon taken in Puget Sound are fish migrating into the Fraser River to spawn, these races, if their existence can be demonstrated, will be mainly races of sockeye salmon spawned in various parts of the Fraser River system.

Records of daily catches of individual traps in Puget Sound have been collected, and these data are being used to determine indices of annual and seasonal abundance. Since these traps are fixed pieces of fishing gear and have been fished under the same conditions through the period of time covered by the data collected, the average catch per trap per fishing day will be used as the unit of fishing effort in making the annual and seasonal indices of abundance. A great part of the preliminary statistical work has been done, and a publication dealing with this phase of the problem will soon be completed.

### ROGUE RIVER STEELHEAD TAGGING

The tagging of steelhead trout in the Rogue River, under the direction of J. A. Craig, was continued through the summer of 1930 and the winter of 1930–31. These tagging experiments were undertaken for the purpose of determining whether or not two separate populations of steelheads inhabit the Rogue River, one of which makes its spawning migration during the summer and early fall months and the other during the late fall and winter. If two races of steelheads spawn in this stream, it appears that they must spawn either in different localities or at different times. Therefore it is hoped that the tagging experiments, which will give definite information relating to the time and extent of the spawning migrations of the fish entering the river at different seasons, will provide material for answering this question.

The returns from the fish tagged during the summer of 1930 confirm those obtained from the 1929 tagging activities, namely, that the fish entering the river during the summer and early fall migrate to the higher reaches of the river and spawn in the upper part of the Rogue River itself, or in some of the higher tributaries.

Because of high water and bad weather conditions, which made it almost impossible to catch the migrating fish, it was possible to tag only 50 steelheads during the winter of 1930–31. One of those tagged fish was recovered in July, 1931, in the upper portion of the Rogue River.

Another attempt is being made to tag these fish during the winter of 1931–32; and until some recoveries are made from that tagging the question of whether or not two separate populations of steelheads inhabit the Rogue River can not be definitely answered.

## CONSERVATION OF FISH BY MEANS OF SCREENS AND LADDERS

The activities of the bureau's engineers, Shirley Baker and U. B. Gilroy, in perfecting fish screens and ladders for the conservation of the runs of anadromous and migratory fishes in the rivers of the Pacific Northwest during 1931 included (1) the construction of a revolving mechanical fish screen on the Jocko Canal, Mont.; (2) the preparation of, design, and specifications of a revolving mechanical fish screen for the Sun River Slope Canal in Montana; (3) continued operation of mechanical and electric screens on Government diversions in the State of Washington; (4) assistance rendered the State Commissions of Maine, Oregon, Nevada, and Utah regarding fish screen and ladder problems; and (5) the designing of fishways for Sunbeam Dam, Idaho, and Anan Creek, Alaska, and various other inspections and engineering services on major hydroelectric projects in the Pacific Northwest.

### MECHANICAL FISH SCREENS

The revolving mechanical screen recommended and used by the bureau follows the design developed by the Oregon State Commission in 1921, and since that time adopted by the State of Washington. This type was first installed in Ahtanum Canal by the bureau in 1929 and described in previous reports. It continues to be the most satisfactory and reliable type of which we have knowledge, and properly installed is positive in its action. The device is not patented.

*Jocko Canal screen.*—This year to prevent the serious loss of fish on the Flathead project of the United States Indian Irrigation Service in Montana and to encourage the adoption of this type of mechanical screen in that State the bureau installed such a screen on the Jocko Canal. This canal has a capacity of 300 second-feet. The installation consists of three sections of revolving screen cylinders, each being 4½ feet in diameter and having a width of 10 feet.

The point of installation is 6 miles downstream at the outlet of the lower of two small lakes through which water, diverted into the canal from Jocko River, is passed. The purpose of the installation is to prevent rainbow trout from leaving the lakes, and thus it is hoped to accumulate an attractive supply of fish in those waters.

*Sun River slope screen.*—In the proposed Sun River slope screen we have the most ambitious attempt yet made in the application of the revolving mechanical screen. The capacity of this canal is 1,435 second-feet. On this project water is taken from Sun River at a diversion dam in a narrow canyon and transported by canal to Pishkun Reservoir. From the reservoir the water is conveyed to the

system through the Sun River Slope Canal. The site selected for the installation of the screen is at a point approximately ½ mile below the outlet of Pishkun Reservoir. At this point the canal widens out into a natural pond, affording favorably reduced velocities just upstream of where it is proposed to stop the fish by means of the screen.

The typical section of the Sun River Slope Canal has a bottom width of 30 feet, and for the capacity flow of 1,435 second-feet the depth of water is 11.5 feet. In order to maintain satisfactorily low velocities through the screen box the design calls for installation of the screen in five sections, each having a width of 14 feet and a diameter of 13 feet. The supporting box of reinforced concrete contains approximately 370 cubic yards of 1:2:4 concrete and approximately 50,000 pounds of reinforced steel. The five sections of screen are driven by three paddle wheels located just downstream from the screen cylinders and connected to the latter by means of chain and sprocket gearing. In the fabrication of the screens and paddle wheels approximately 20 tons of steel are required. The covering of the screen cylinder is to be No. 10 gage galvanized steel or copper wire screening having a ⅝-inch clear opening mesh.

Final working drawings of this screen will be filed with the Reclamation Service so that reference to them may be had by the Reclamation Service on all new projects wherein a fish-conservation problem is involved. This in itself is held to be justification for the time and expense contributed by the Bureau of Fisheries in preparing these plans. It will make possible, at the time that new projects are first planned, for proper fish screens to be provided in the original designs of the diversion structure, which will work both for the conservation of fish and economy in construction.

Cooperating with the Oregon Game Commission, field examinations were made and designs and cost estimates prepared covering mechanical-screen installations for Farmers Irrigation Ditch (capacity 100 second-feet), on Hood River, and C. O. I. Canal (capacity 650 second-feet), Pilot Butte Canal (capacity 450 second-feet), Tumalo Canal (capacity 150 second-feet), Swalley Canal (capacity 125 second-feet), and Arnold Canal (capacity 100 second-feet), the last five named being on the Deschutes River.

In the spring of 1931 the Utah Power & Light Co. applied to the Bureau of Fisheries for aid in solving the fish-screening problem at their Lift Plant, situated on Bear Lake. This lake constitutes one of the largest water-storage projects in the country. The problem involves trout of various kinds which frequent the waters of Bear River and Bear Lake. The situation is a peculiar one. Under the scheme of operation water is lifted from the lake by means of large-capacity, low-lift pumps and discharged through a canal into Bear River, where it flows through a series of power plants. During high stages of the river the flow is reversed, and the canal conveys water from the river through the pumping plant for storage in the lake.

The situation was studied very carefully in the field in company with the district supervisor of the Bureau of Fisheries, the State Game Commissioner of Utah, and the engineers of the Utah Power & Light Co. It was decided that instead of using either electric or mechanical screens, which for an installation of this magnitude

would be prohibitive in cost, the best solution of the problem would be to gradually stock the lake with fall-spawning fish and protect the pumping plant by means of removable steel racks which would have to be held in place for only a short time each year. The company is being asked to provide these racks and to cooperate in bearing the cost of a new hatchery which is to be built on Bear Lake by the Bureau of Fisheries and the State of Utah.

## ELECTRIC FISH SCREENS

In three previous reports of this division there is presented the history and development of the electric fish screen and its use by the Bureau of Fisheries up to the start of the irrigation season of 1931.

The experimental work conducted in the sluiceway at Gold Ray power house and at the Fort Klamath hatchery in the fall of 1930 demonstrated the superiority of the insulated type of screen over the old-style grounded installation, and led to the adoption of this improved type on all installations maintained by the Bureau of Fisheries. The improved type of screen consists of a double row of 6-inch diameter pipe electrodes fabricated from No. 20 gage galvanized iron. These electrodes, properly weighted at the lower end, are suspended in the water from supporting cables. The most effective spacing has been found to be 4 feet center to center of pipes in rows with 6-foot spacing between rows. Electrification is accomplished with 60-cycle alternating current at a potential ranging from 55 to 65 volts. Convenient voltage regulation is provided by means of a transformer specially tapped on the secondary side and designed to carry a sustained short circuit.

Three years of operation with the electric screen has disclosed the weaknesses of this type of fish-protective device. The chief difficulty is in the antagonism which is likely to develop in the public mind when some fish are killed or stunned by contact with the electrified water. Such attitude entirely disregards the fact that the electric screen may be operating to save the majority of fish, but it creates a problem in public relations which can not be overlooked. Furthermore, the action of the electric screen can never be expected to be 100 per cent effective as is the mechanical screen. Another difficulty is the patent situation, which raises a restriction which can be avoided by use of the mechanical screen. For these reasons the investigators do not recommend the electric fish screen for general use. In the case of the electric screens operated on United States Government projects in the Yakima country the situation is somewhat different. There the bureau itself operates the screens, giving them very careful attention and supervision, and in Yakima County, Wash., alone the use of the electric screen is free from patent royalties. These Yakima screens undoubtedly save a large proportion of the fish, and it is felt that the continued use of these particular electric screens is justified.

*Sunnyside electric screen.*—The Sunnyside Canal, main diversion of the Yakima project of the United States Reclamation Service, diverts water from the Yakima River near Yakima, Wash. The capacity of the canal is 1,500 second-feet. The diversion period of 1931 extended from February 20 to October 20. During the period

of maximum irrigation demand, which is also the period of chief migration of fish, this canal carried in excess of 1,000 second-feet.

This screen is of the new, improved insulated type, consisting of a double row of pipe electrodes located in the forebay in front of the headgates. This year the location of the screen was moved upstream and out of the river as far as practicable in order to escape the higher water velocities which existed at the old site.

In addition to this main electric screen there was installed an auxiliary screen of similar type extending out from the upstream end of the main installation at right angles to the shore line for a distance of 24 feet. The purpose of this auxiliary screen is to give a preliminary warning to downstream-migrating fish as they approach the diversion point, and thus it is hoped to divert these fish before they enter the higher water velocities which exist at the main screen.

As previously commented upon, water conditions at Sunnyside Dam at certain times produce very severe operating conditions affecting the electric screen. The crest length of Sunnyside Dam is 500 feet. During practically the entire irrigation season flashboards are maintained along the crest raising the water surface approximately 2.5 feet. At the center of the dam is located a large concrete fishway built by the Bureau of Fisheries in 1929. This ladder constitutes the chief by-pass channel at the Sunnyside installation. It undoubtedly serves many downstream migrating fish, especially those that travel down river along the west shore. However, it has long been recognized as desirable to have a by-pass channel located close to the electric screen which is situated at the east abutment of the dam. To this end, early in July a stem gate was installed in the logway which extends through the dam close to the downstream end of the electric screen.

In the operation of any by-pass at the Sunnyside diversion the main difficulty is lack of water. The irrigation season of 1931 was the most critical short-water year in the history of the Yakima project. The Sunnyside diversion is the lowest Government diversion on the Yakima River, and at times the entire flow of the stream is diverted directly into Sunnyside Canal. At such times practically all the flow comes from storage reservoirs maintained by the Government, and all of this storage water is contracted for and sold to the irrigation interests. When these irrigation requirements exceed the available flow, there is no adequate by-pass flow available for the conservation of fish life.

There were times in the summer when there was practically no overflow, but whenever even a small amount of water was available for this purpose, the ready cooperation of the Reclamation Service insured that it was put through the by-pass channels.

*Gold Ray intake screen.*—Early in April the intake screen at Gold Ray power house of the California-Oregon Power Co. was put into operation at a point upstream of the trash rack at the intake. This screen, also, was of the improved insulated type, consisting of a double row of pipe electrodes. This year the screen was installed at an angle with the intake in the hope that such location would encourage use of the newly improved north bank fishladder as a by-pass for downstream-migrating fish. It proved, however, that close proximity to the steel trash rack was an unfavorable factor, it being

found that a good many fish were passing through the electric screen and being trapped between it and the trash rack. Accordingly, use of this electric screen was discontinued late in May. It was found that the newly improved fish ladder with its illuminated entrance proved a very attractive by-pass for fish, even without the aid of a screen in the intake.

*Gold Ray tailrace screen.*—The first electric screen installed by the Bureau of Fisheries in the tailrace of the Gold Ray power plant of the California-Oregon Power Co., was put into operation in the spring of 1929. Its purpose was to keep the mature upstream-migrating salmon and steelhead out of the tailrace waters and headed up the main channel of the river to the fish ladders at the dam. For more than two years this screen operated, keeping the tailrace waters entirely free of upstream migrants and accomplishing its mission substantially without injury to the fish. Upon July 17, 1930, the old grounded type of screen was replaced by the new, improved type, consisting of a double row of 6-inch diameter pipe electrodes. The effectiveness of the new screen was early proved by its successful operation against the fall run of silver salmon and the run of steelhead which continued throughout the winter and spring of 1931.

On May 25 the Bureau of Fisheries was notified by an official of the Jackson County Game Protective Association, a local sportsmens' organization of Medford, Oreg., that hundreds of salmon were being electrocuted at the Gold Ray installation. Investigation was made May 27 and a large number of electrocuted salmon were found in the main channel of the Rogue River below the Gold Ray power plant. At this time, also, some salmon were found ahead of the electric screen in the tailrace. It is evident that these salmon had penetrated the screen very recently, for on April 25, when the site was inspected, a good run of Chinook was in progress, with schools of these salmon leaping in the tailrace just below the electric screen and the tailrace above the screen was entirely free of salmon.

A great deal of publicity had been given to the electrocution of salmon in the Rogue River, and the electric-screen installation was blamed for the condition. After field investigation on May 27 the voltage of the tailrace screen was reduced from 65 to 50 volts, and this potential was maintained for a short period of time, during which observations could be made. On May 30 the officials of this sportsmen's organization, acting without authority from the State Commission of Oregon or the Bureau of Fisheries, prevailed upon the vice president and general manager of the California-Oregon Power Co. to order the screen disconnected. Upon June 1 the electrodes were removed from the water. Upon June 2 and 3 the investigators, in company with representatives of the power company and the sportsmen's organization, inspected conditions in the field. At that time there were at least from 1,200 to 1,500 mature Chinook salmon in the tailrace, these having come in within a few hours after the electric screen had been deenergized. This was striking evidence of the effectiveness of the electric screen in having prevented the entrance of these salmon over a long period of time. At the end of this conference the bureau was advised by the officials of the Jackson County Game Protective Association that reinstallation of the tail-

race screen was not desired. The bureau representatives held that the operation of the electric screen was in no way responsible for the electrocution of the salmon, and pointed to the record of success which this screen had enjoyed for a period of more than two years.

During the conference with this committee and the power company it developed that upon April 16 and May 29 there had been short circuits on a 66,000-volt line at Gold Ray. The Gold Ray plant is grounded into the river and the path of the current for these short circuits was through the river to Grants Pass substation No. 2. This explained the electrocution of the salmon in the vicinity of Gold Ray plant and for a considerable distance down river, for at this time this stretch of the channel was alive with a large run of Chinook Salmon.

A short time later the Oregon Fish Commission, feeling confident that the electric screen was not responsible for the trouble at Gold Ray and having information of similar conditions which had existed upon several occasions in previous years, long before the installation on any electric screen, sought information from the power company as to the occurrence of short circuits in this system. These data, covering a 5-year period, were made available to the Oregon Fish Commission, which in turn presented them to the Bureau of Fisheries for their study. Seeking the best possible advice in this matter, the Bureau of Fisheries retained Prof. F. O. McMillan, research professor of electrical engineering, Oregon State College, to make a thorough investigation of the situation, with special reference to any possible effect which might have been produced by the presence of the electric screen in the tailrace. After thorough study in the field and conference with officials of the power company, Professor McMillan reported under date of August 22, 1931:

> I can assure you at this time that the findings are such that there is absolutely no question in my mind but that the electric fish screen had nothing whatever to do with the destruction of the fish that were killed. You will probably recall that I have frequently called attention to the desirability of having the electric screen entirely insulated, from the electrical system supplying the power, by means of an insulating transformer, and that was the condition of operation of the electric screen at the Gold Ray power plant at the time of the electrical disturbances in question. During my investigation in Medford I personally measured the insulation resistance of the fish-screen transformer and of the conductors and cable supports for the electric screens and found the insulation to be absolutely intact. This means that it would be impossible for any of the ground current of the electrical system during an abnormal electrical disturbance to flow back through the electric screen.

In his comprehensive technical report, under date of October 4, are set forth the indisputable findings, which show:

> (1) That the electrocutions of fish which occurred on April 16 and May 29 were due to ground currents existing through accidental single-phase operation of the 66,000-volt line No. 7 between Gold Ray power plant and Grants Pass substation No. 2, these accidental single-phase operations occurring when attempts were made to reestablish service on line No. 7 following line breaks.
>
> (2) That it was impossible for the electric screen to have conducted any part of the ground currents, because it was insulated from the electrical system by means of an insulating transformer designed for the express purpose of preventing any direct electrical connection with the supply system.
>
> (3) That the operation of the electric screen at the time of the accidental grounds was probably responsible for preventing the destruction of a much larger number of salmon than did occur.

Thus we have absolute scientific proof that the operation of the electric screen was in no way responsible for the electrocution of salmon in the Rogue River and the unwarranted removal of this screen from the tailrace of the Gold Ray plant has deprived the river of an effective means of fish conservation.

*Check of fish in Yakima ditches.*—Check on the efficiency of the electric screens in the Yakima country is obtained by observation of fish found in the systems. As in the seasons of 1929 and 1930, comprehensive check of fish left stranded in the system at the end of the irrigation season was made and, in addition, during the past summer special checking operations were conducted at strategic points in the Sunnyside and Wapato systems. Likewise, W. N. Wagner, the bureau's inspector, paid close attention to the fishing conditions reported to exist in the canal systems and the rivers and himself fished these waters on numerous occasions for the purpose of obtaining data at first hand.

In the Sunnyside Canal (ditch capacity, 1,500 second-feet); irrigation season February 20 to October 20; main canal, 60 miles long; electric fish screen installed) check of the fish left stranded at the end of the season showed the following: 75 salmon, 807 trout,[8] and 36,300 whitefish.

As in the past, cull fish (suckers, squawfish, chisel mouth, etc.) predominate all other types. The great amount of whitefish found this year as well as last indicates that the electric screen is not efficient against this species. It is the opinion of competent observers that the bulk of the whitefish enter the system when they are very small (perhaps about 1½ inches long), which is the time when the electric screen would be least effective against them.

In addition to this comprehensive check made at the end of the season, a special check was conducted early in the summer in lateral 71.66 (Benton extension) at the lower end of the Sunnyside system. This location was the point at which some 10,000 young salmon were reported last year. The check was made by placing a stationary screen at an irrigation drop. The check was continued over the 71-hour period from noon June 18 to 11 a. m. June 21, during which period observers were in constant attendance. The flow of the lateral at the checking point was 35 second-feet. Results showed but 36 young salmon, no trout, 3 whitefish, and 517 cull fish. This check was made at a time when large schools of young salmon and trout were observed near the intake at Sunnyside Dam.

Salmon and trout were especially numerous in the Yakima River this year, and the small number of anadromous fish found in the system indicates that the electric screen functioned to prevent the loss of a large percentage of these fish.

The best possible comparison between fish conditions as existing on a screened and unscreened diversion in the Yakima country is furnished by the check upon the Tieton and Selah-Naches systems. On the Selah-Naches Canal, diverting about 300 second-feet and operated by a private irrigation company, there is no screening device of any kind installed. Two checks of fish left stranded in the Selah-

[8] Total of 807 trout includes 400 reported by a local fisherman who, with rod and line, fished along 12 miles of canal and reported his own catch and those of several other fishermen as well.

Naches Canal were made this fall. The first count was made during the first shutdown of the season, which extended over the period September 16 to 20. The actual count of fish recovered was: 3,748 salmon, 543 trout, 1,142 whitefish, and 877 cull fish.

Upon September 21 the Selah-Natches again began to divert water. Approximately one month later the canal was shut down for the season. Check of fish actually recovered from the system at this time showed 825 salmon, 122 trout, 348 whitefish, and 139 cull fish.

Thus it is seen that this unscreened diversion taking water from the Naches River under conditions similar to those existing at the Tieton diversion disclosed a total of 5,238 salmon and trout, as against a total of 514 salmon and trout left in the Tieton system in which the electric screen had been in operation for only 141 days out of a total of 251 days.

## FISH LADDERS

The activities conducted by this investigation in connection with fishways during 1931 include:

(1) Operation of fish ladders on Sunnyside and Wapato Dams on Yakima River.

(2) Design of fishways for North River project, Washington.

(3) Inspections and supervision of fishway construction at Rock Island project on Columbia River.

(4) Survey of fishway requirements for the State of Maine.

(5) Investigations and design of fishway for Sunbeam Dam, Idaho.

(6) Investigation and designs for improvement of channel at Anan Creek, Alaska.

In 1929 the bureau installed a reinforced-concrete fish ladder of large-pool design at the Sunnyside Dam of the United States Reclamation Service. In 1930 a similar structure was built to our design at the Wapato Dam of the United States Indian Service. Both these ladders on the Yakima River have been under the close supervision of the bureau. They have continued to function perfectly in passing the several large runs of salmon up the river without delay.

*Proposed fishway for Sunbeam Dam.*—Last spring the aid of the Bureau of Fisheries was asked by the Fish and Game Commission of the State of Idaho in the matter of the fishway problem existing at Sunbeam Dam on the upper Salmon River near Yankee Fork. The dam is of the concrete-arch type, approximately 30 feet high.

The scheme proposed by the bureau utilizes the present diversion tunnel as part of the fishway structure and will not in any way injure or impair the value of the property of the Sunbeam Mining Co.

*Fishway problem at Anan Creek.*—During the season of 1930 it was found that at certain water stages on Anan Creek, Alaska, the upstream-migrating salmon had considerable difficulty in ascending the channel, due to the presence of natural obstructions consisting of rapids and falls. Accordingly, in July, 1931, field examinations and surveys were made and a design worked out for the improvement of this condition. It was found that the principal obstruction occurred along the stretch of channel extending from the present log dam (situated 500 feet downstream from the counting weir) a distance

of approximately 200 feet upstream to the head of the Upper Falls. The rise in water surface along this 200 feet of channel is normally about 12.8 feet.

The most practical solution of the difficulty is held to be by use of timber dams constructed of heavy logs faced with planking. The installation of three such new log dams along the critical stretch of channel was recommended.

## NEW AND PROPOSED POWER PROJECTS

A matter of fundamental importance to fish conservation is the provision of proper equipment for the safe handling of fish at hydroelectric power developments. A good share of the activities of this investigation has been devoted to this work at new and proposed projects in the Northwest. During 1931 the following major developments claimed attention:

(1) Rock Island development of Puget Sound Power & Light Co. on the Columbia River, Wash.

(2) North River project of Western Washington Electric Light & Power Co. on North River, Wash.

(3) Ariel development of Inland Power & Light Co. on Lewis River, Wash.

(4) Cascade Rapids projects (application of Columbia River Power Co. and application of Charles O. Lentz et al.) at Cascade Rapids on Columbia River.

*The Rock Island project.*—The original requirements for fish protection as written into the project license of this major power development of the Puget Sound Power & Light Co. on the Columbia River near Wenatchee, Wash., called for the protection of both the intake and tailrace waters by means of electric fish screens. However, with the completion of the power house and east-channel spillway dam, in the winter of 1930, opportunity was afforded for the study of physical conditions at the site, and it became evident that there was good possibility that migrating fish might safely negotiate the waters about the power house without the aid of electric screens. Conferences were held with the engineers of the Stone & Webster Co. in Boston, and after thorough study it appeared that in fairness to the company immediate installation of the electric screens should not be required, but that a trial period of operation should be allowed to determine whether or not such equipment would be necessary.

Under date of September 4, 1931, the company obtained an amendment to their Federal Power Commission license providing for change in the plan of development. As regards safety, location and design and relocation of the dam have made possible the construction of a fish ladder offering many advantages over the structure originally proposed for the west channel.

The lower portion of the new ladder consists of a series of pools excavated in solid rock and the upper portion is of reinforced concrete exactly similar to the fish ladder at the power house, the grade being 1 to 10 and the pools being 10 feet long by 20 feet wide and providing for minimum depth of 4 feet of water. Under the new plan of development ultimate pond elevation has been set 4 feet lower than the height originally proposed.

Test of the Rock Island fish ladders will be had with the arrival of the 1932 run of Chinook salmon. By that time construction work will have been completed and the condition of initial development will exist.

*North River project.*—As commented on in our report for 1930, the North River project proposed the development of 37,500 horsepower by the construction of a concrete dam 112 feet high on the North River, in Pacific County, Wash. Following field inspections and conferences with officials of the Division of Fisheries, State of Washington, and the Pacific coast representatives of the power company, conferences were had in New York in January, 1931, with George Waesche, chief designing engineer of Sanderson & Porter, the engineers for the project, and details of fish-protective devices were worked out.

The plan proposes mechanical handling of both upstream and downstream migrating fish. For collecting the upstream-migrating fish a trap pool is located on the downstream side of the power house and directly over the tailrace. Entrance to this pool is provided for through an 8-foot weir gate which is float controlled to give automatic adjustment to tail-water level. This trap pool leads along the downstream face of the power house to a collecting pool at the toe of the dam. Into this collecting pool a hoisting bucket submerges and water, pumped from the tailrace, flows from the bucket and collecting pool out through the trap pool to serve as an attraction for the fish. When a sufficient number of salmon have entered the bucket it is hoisted on an inclined track up the face of the dam and dumped into the reservoir through a metal chute through which a flow of water is maintained.

The downstream-migrating fish are to be passed from the reservoir to tail-water through six 12-inch intake pipes connecting with an 8-foot standpipe on the downstream face of the dam.

Market conditions have delayed the construction of this project; but when work is undertaken, the action of the fish-protective devices is expected to draw considerable attention, for the operation of this project will afford the first large-scale test of the mechanical handling of both upstream and downstream migrating fish at high dams.

*Ariel development.*—This season saw the completion of the initial stage of the Ariel development, planned for an ultimate capacity of 180,000 kilowatts and situated on the Lewis River, a tributary of the Columbia River, in Washington. This fall the first 40,000-kilowatt unit went into operation and the initial test of some novel devices for fish protection was afforded with the arrival of the fall run of salmon. Here the dam is 180 feet high, and a carefully planned and comprehensive scheme of mechanical handling has been worked out in lieu of the construction of a fish ladder. The scheme involves trapping of the upstream-migrating salmon and the ripening, spawning, and rearing of these fish on a very large scale.

The feature of principal interest to designers of fishways is the trap pool for collecting the upstream-migrating fish. This pool extends along the downstream face of the power house directly over the tailrace. Entrance to this pool is afforded through three 10-foot entrance gates, which, by means of float control, automatically adjust themselves to tail-water level. Water pumped from the tailrace is

discharged into the upper end of the collecting pool, and the attraction of this flow brings the fish into a hoisting tank, which in turn is loaded onto a truck for transporting the fish to the ripening ponds. The automatic gates have been found to function very satisfactorily and the fall run of salmon passed from the tailrace and into the trap pool without delay. The success of this type of installation for collecting upstream-migrating fish from tailrace waters is most encouraging and would seem to indicate that the solution of the problem of handling fish at high dams lies in the use of equipment of this kind.

*Cascade Rapids projects.*—At the present time there are two applications pending before the Federal Power Commission for preliminary permit for a power development at Cascade Rapids. Both projects proposed the development of large blocks of electric power by the construction of low dams and diversion works at the crest of Cascade Rapids in the Columbia River.

If such a development is ever undertaken here, very liberal provisions for fish protection should be insisted upon, especially in the matter of by-passing a large flow of water.

## SALMONIDÆ OF NEW ENGLAND

Throughout the past year Dr. W. C. Kendall, senior ichthyologist of the bureau, has continued his studies of the salmonoid fishes of New England at the laboratory at Freeport, Me. Three distinct problems which have engaged his attention for many years have been continued. The study of the smelt of New England, except for observations in brooks and streams during the annual spring runs, has been temporarily laid aside in order to give attention to the completion of a study on the salmon, and for analysis of an extensive collection of trouts or chars of North America. As a result of these efforts in the interest of conserving the New England smelts, which have suffered marked depletion in recent years, the last session of the Maine Legislature finally passed regulations which it is believed will be effective in protecting the spawning runs of fish in fresh-water streams.

*Landlocked salmon.*—A manuscript on the landlocked salmon has been completed and submitted to the Boston Society of Natural History for publication as Part II of a memoir on the Salmonidæ of New England, and will be published as a quarto volume with handsome colored illustrations. This memoir pertains to the origin of the fish, the reasons for regarding it as a distinct species, and the known facts concerning its life history.

Concerning its origin, it is hypothetically argued that it is the product of the stage of fresh-water inundation following the last glacial period, when great estuaries and extensive inland areas of salt water were transformed by melting ice into inland fresh-water seas which gradually shrunk to the recent lakes naturally inhabited by the landlocked salmon. To those conditions the fish was compelled to adjust itself or "go fossil," so to speak. In fact, it might be regarded as a living fossil, which is implied in the name very appropriately given it by Malmgren, who called it *Salmo relicta*. It was left behind, as it were, by the receding marine environment and

underwent physiological changes, one of which, perhaps, was the lost power of the young to undergo the transformation from parr to smolt, which immunizes the young of the sea salmon against any harmful effects in the transition from fresh to salt water.

In addition to all the other evidence, and there is considerable, that the lake salmon (the preferred designation) should be regarded as a distinct species, tables of percentages of proportional measurements were prepared and analyzed, and comparison made with like proportions of sea salmon. Some of the proportions show no differences whatever, excepting those due to sex, age, or size of the fish. In fact, it is only by averages that any of the proportions show differences, for they all overlap as they do with other species of Salmonidæ. There seems to be no possible way to describe an individual salmonid in terms of proportions by which a species can always be positively identified, but the *ensemble* of proportions, after elimination of variations due to sex, size, and age, when expressed in averages, tells the story. One authority on the sea trout of Europe (*Salmo trutta*) states, in effect, that it can not invariably be distinguished from *Salmo salar*, but there can be no doubt about their being distinct species.

In one set of proportions the landlocked salmon differs from the sea salmon (by averages) in exactly the same way that *Salmo trutta* does. This is in the proportion of the part of the body known as the caudal peduncle, which in the landlocked salmon averages much stouter than that of the sea salmon. The difference is most clearly shown by averages of the percental proportions of the least depth of the caudal peduncle to the distances from adipose and anal fins to caudal, as above mentioned. These proportions are greater in the male of both species than in the females, but the differences between the two species are maintained in both sexes.

*Chars.*—As in the case of other Salmonidæ, there has been no uniformity and stability of classification of the chars (Salvelinus and others). One reason for this is that no one has had an adequate view of the whole field, and, therefore, individual opinions have been based upon glimpses only of the situation outside of immediate surroundings.

In ichthyology generally, both European and American systematists have been more or less at variance in their interpretations and manner of expressing what they saw. In both countries, but more particularly in Europe, there have been two schools of systematic ichthyology. The tendency of one, which was the larger school, was to reduce the number of nominal species to its lowest terms. That of the other was to multiply them particularly as pertained to local faunas.

Thus there have been those who have regarded all the chars of Europe as constituting a single species, with local variations. Others, especially in Great Britain, have discerned in those variations characters regarded as of specific significance.

The single species advocates have extended their conception of that species to include chars of the Arctic regions of both Europe and North America whenever they have had the occasion to consider them. In America the same tendencies have obtained, but not always consistently.

Some years ago Doctor Kendall undertook to bring order out of the prevailing inconsistencies and attendant disorder as pertained to the chars and collected specimens from everywhere possible, far and near. The leaders of various Arctic expeditions were importuned to bring as many specimens as conditions permitted, but very few were obtained from any one locality. However, in the long run, with a few from here and there, a good many specimens have come to hand. The few specimens from scattered localities furnish links, which in time others may be able to unite in a more continuous chain, but it never can be complete, for many links are irretrievably lost through neglect. The fish are extinct, and, in one instance at least, there is not a preserved specimen in existence. It is the purpose of the present work on the chars to place all available links in the sequence that the study of them seems to indicate.

## INVESTIGATIONS IN AQUICULTURE

Investigations in fish culture and related problems were considerably extended during the past year. This was made possible by an increase in the personnel and in the facilities for experimental work. These investigations include studies pertaining to all phases of fish-cultural activities. Naturally special attention is paid to problems relating to hatchery operations, but the work is by no means confined to this field. It is becoming more and more evident that fish-cultural activities must be extended to include the welfare of fish after they leave the hatchery. This necessitates a thorough knowledge of conditions in the waters in which fish are to be planted so that a scientific stocking policy can be developed which will insure an adequate return for the labor and money expended in fish-cultural operations. It is becoming apparent also that in many instances much can be done to improve conditions in natural waters so that they will support a larger fish population than at present. Owing to limited personnel it has been impossible to devote much attention to these larger problems in the past; but with the increased facilities now available, it is hoped to place more stress on work in this field.

The fish-cultural stations at Fairport, Iowa, Pittsford, Vt., and Leetown, W. Va., which are operated primarily for experimental purposes, will serve as headquarters for investigators who will not only devote their time to carrying on investigations at their respective stations but will also conduct field studies in the streams and lakes of the surrounding territory.

It is not intended, however, to limit investigations to these experimental stations, but investigators will be stationed at hatcheries in various parts of the country where they will carry on experiments and studies dealing primarily with local problems. These investigators will also be available to render assistance to both Federal and State hatcheries in their respective territories.

The activities of the Fairport station are almost entirely confined to the study of problems connected with pond-fish culture, while those of the Pittsford station are limited to trout culture and its attendant problems. The new station at Leetown, W. Va., is designed for work with both trout and the so-called warm-water fishes; but, owing to insufficient funds to develop the pond system, the work for

the present will be devoted largely to trout, especially rainbow and brown trout, which are not dealt with to any extent at the Pittsford station. Arrangements have also been made to station an investigator temporarily at the State hatchery, Hackettstown, N. J., where a number of bass ponds have been made available for experimental work.

## POND-FISH CULTURE

### FAIRPORT STATION

The facilities of this station, which is operated under the direction of Dr. A. H. Wiebe, have recently been increased by the construction of a number of new ponds which were in use for the first time during the summer of 1931. Several of the old ponds have also been rebuilt, which has greatly increased their efficiency. The main water supply is pumped from the Mississippi River into a reservoir, whence it is carried by gravity to the ponds. There is also a limited supply of well water which is available for use in several of the smaller ponds.

*Black bass.*—The bass production was not as satisfactory as in previous years, owing to exceptionally cold weather in the spring, which interfered with spawning and caused the fish to leave the nests shortly after the eggs were laid. The cold weather also delayed the spawning of many of the fish, causing more variation than usual in the size of the fry. As a result, there was an increase in cannibalism, and the percentage of fingerlings which survived until fall was considerably less than usual. The decreased yield in numbers was partially offset by the better quality of the fingerlings, which averaged larger than usual. There was an exceptionally large number of fingerlings around 6 to 7 inches in length.

One of the greatest problems in bass culture is to reduce the number of these large fingerlings. They are undoubtedly cannibals and are probably responsible for a large part of the losses which normally occur during the summer. The use of forage minnows tends to produce a more uniform growth in the fingerlings, and the percentage of exceptionally large fish is considerably less, but during the past season this was in large part nullified by the abnormally long spawning season, resulting in fry differing greatly in age which afforded unusually favorable conditions for cannibalism.

In spite of the unfavorable conditions the production of fry by 2-year-old bass was better than expected, the average number per female being about 1,800. These fish averaged less than one-half pound in weight in the spring, but more than doubled their weight during the summer.

A comparison of golden shiners and blackhead minnows as forage for smallmouth bass showed that, as in the case of the largemouth, the shiner is much superior for this purpose. In a pond stocked with shiners the yield of smallmouth fingerlings was at the rate of 12,575 per acre, while in adjoining pond stocked with blackhead minnows but in every other way treated the same the yield was only 7,215 per acre.

*Crappie and bluegill sunfish.*—Several ponds were stocked with crappie and bluegill sunfish, and the results agree with those of previous years in indicating that this is an excellent combination.

In this case the bluegills serve as forage fish for the crappies, and appear to be better suited for this purpose than either the golden shiner or the blackhead minnow. The best production of black crappie fingerlings was at the rate of 20,562 per acre. In addition there were 1,430 exceptionally large bluegills, making the total production of crappie and bluegills approximately 22,000 per acre.

As regards weight, however, the best production was obtained in a smaller pond, where the yield of black crappie and bluegill sunfish was at the rate of 260 pounds to the acre. This is the largest yield of strictly game fish which has been obtained at Fairport. In comparing these figures with the production at other hatcheries, it should be remembered that no food was added to either pond other than a small amount of fertilizer and that the output represents the actual amount of fish flesh produced in the pond.

The results in both bass and crappie ponds indicate that a fairly abundant growth of submerged vegetation is required for best production. In all ponds showing a satisfactory yield of fish there was a good growth of this type of vegetation, but ponds with scanty vegetation or with a predominant growth of emergent plants were less productive.

*Forage minnows.*—Observations on the blackhead minnow have yielded some very interesting results. It was found that the activities of the male on the nest not only serve to protect the eggs from various enemies but also to keep up a continuous circulation of water and that the eggs soon die when the male is removed. This minnow is very prolific and a single female may deposit several thousand eggs during the season. One female under observation deposited no less than 4,414 eggs. These eggs were not all deposited at once but at 11 different times during the summer. A surprising result was the discovery that young blackheads hatched early in the season may mature and spawn when only 2 months old.

*Effects of high oxygen concentrations and changes in pH.*—A series of experiments have been conducted by Doctor Wiebe to determine the effects on fish when the atmosphere above the surface of the water is replaced with pure oxygen. The use of oxygen instead of air when fish are to be shipped long distances is constantly increasing, but the technique employed still leaves much to be desired. Ordinarily the oxygen is forced into the water at the bottom of the container and allowed to escape from the surface. This, of course, results in a great waste of oxygen. It is also claimed by some fish culturists that the gills are affected by the oxygen and may become seriously inflamed.

In view of these facts it was decided to try the effects of high concentrations of dissolved oxygen by placing the fish in a closed container and replacing part of the water with oxygen at various pressures. Several species of fish were used in these experiments, including large and smallmouth black bass, crappie, bluegill sunfish, goldfish, and golden shiners. It was found that all these fish could tolerate an atmosphere of pure oxygen over the surface of the water even when pressures as high as 10 to 15 pounds were maintained for a period of 24 hours. Dissolved oxygen concentrations as high as 41 parts per million were obtained in these experiments without injury to the fish. It was also found that sudden transfers from

high to low oxygen concentrations, and the reverse, had no injurious effects. In several instances fish used in these experiments were kept under observation for several weeks, but in no case were there any indications of injury to the gills.

The experiments also showed that fish can tolerate a high carbon-dioxide content, provided there is also a high concentration of dissolved oxygen. In some instances the $CO_2$ content rose to over 50 parts per million without any apparent detrimental effect.

These results have a very practical bearing, since they indicate that it will be possible to ship fish for long distances in closed containers with an adequate supply of oxygen stored under pressure. Further experiments in this direction are planned for the near future.

Experiments on the effect of sudden changes in hydrogen-ion concentration (pH) on several species of fish show that they are able to withstand rapid and extensive changes without any injurious effects. Goldfish and green sunfish tolerated rapid changes from pH 7.2 to 9.6 and from 8.1 to 6.0. Fingerling bass were apparently unaffected by rapid changes from pH 6.1 to 9.5 and also by a similar change in the reverse direction. The experiments show that these species of fish can tolerate the entire pH range of most unpolluted lakes and rivers, and hence that hydrogen-ion concentration has very little if any direct effect on the distribution of these fish in nature. The results also indicate that no bad effects need be anticipated in stocking natural waters when the fish are suddenly transferred to a water with a quite different pH from that in which they were reared.

### UPPER MISSISSIPPI WILD LIFE AND FISH REFUGE

Investigations in the sloughs of the Mississippi River bottoms in the vicinity of Trempealeau, Wis., were continued during the summer of 1931 under the direction of E. W. Surber.

As was the case at the Fairport station, three periods of unseasonably cold weather during the spawning season proved disastrous to the eggs of the black bass. The number of fry which hatched was so small that it was impossible to utilize most of the sloughs which had been prepared for stocking with bass. Only about 40,000 fry were obtained; and owing to unfavorable conditions in the sloughs as a result of the abnormally hot, dry summer, only 5,330 fingerlings were recovered in the fall. Conditions were more favorable for bluegill sunfish, and Long Pond, which was stocked with 140 adults of this species, produced 40,000 fine fingerlings. A much higher production was obtained in Pickerel Slough, which yielded 320,000 fingerlings from 135 adults.

Principally on account of their feeding habits, gizzard shad have been frequently recommended as an ideal forage fish. It has, however, been impossible to get these fish to propagate in small bass ponds, several attempts of this nature at Fairport having been attended with failure. In the hope that the sloughs would afford more favorable conditions, two ponds were stocked with large adult shad early in the spring. These fish spawned successfully and large numbers of young were produced in both ponds. They grew very rapidly, however, but it is questionable if they would make a satisfactory food for young bass of the same season. On the other hand,

it is possible that the gizzard shad will prove of value for use with yearling and older bass.

Determinations of soluble phosphorus, nitrite, and nitrate ammonia, organic nitrogen, and hydrogen-ion concentrations were made at 10-day intervals throughout the summer in 11 sloughs. Plankton samples were collected every 10 days, while bottom samples were taken monthly in the same sloughs. A report covering these and similar observations in the sloughs during previous years will soon be ready for publication.

Two sloughs were fertilized regularly with sheep manure and superphosphate. Although no bass fry were available to stock these ponds, the effects of the fertilizer upon the bottom fauna and plankton were studied in detail.

Whether connected directly with the river or not, the sloughs are dependent on the river for their water supply; and when the water is exceptionally low throughout the summer, as in 1931, conditions may become very unfavorable for game fish. On the other hand, during exceptionally high flood stages it is frequently impossible to prevent the fish from escaping into the river. For these and other reasons it is felt that under present conditions it is not economically feasible to utilize these sloughs for the propagation of fish and that efforts in this direction had best be abandoned for the present. A potent factor in reaching this decision is the fact that with the construction of the 9-foot channel, which is scheduled for the near future, conditions along the river will be so changed that utilization of the sloughs for fish cultural purposes will present quite different problems from those confronting us at the present time.

### HACKETTSTOWN STATION

During the spring of 1931 arrangements were made for cooperative investigations in bass culture to be conducted at the State hatchery, Hackettstown, N. J. Accordingly, Dr. Paul R. Needham was detailed to the Hackettstown hatchery in June and immediately began systematic observations on a number of ponds in which bass were being reared. Although the investigations were not begun until late in the season, some very interesting results were obtained in two ponds which had been used for holding trout during the winter.

One pond which had been used for eight winters as a trout pond was much richer than the other, the bottom being covered to a depth of several inches with a layer composed of trout excrement mixed with silt and muck. After the trout were removed a dense growth of Daphnia developed. Both ponds were heavily stocked with largemouth bass fingerlings late in June and the fish were allowed to remain until August. In the richer pond the growth of Daphnia was so abundant that but little diminution in their numbers was noted over the entire period of 38 days that the bass remained in the pond, so that there was always plenty of food available. In the other pond, however, the growth of Daphnia was insufficient to supply the needs of the bass, and it was necessary to introduce large quantities from another pond. In both ponds there was a large growth of midge larvæ and sowbugs in addition to the Daphnia.

An examination of the stomach contents of fish from both ponds showed that approximately one-half the food consisted of Daphnia,

the remainder being made up mostly of midge larvæ and sowbugs. The fish in both ponds made a rapid and remarkable uniform growth, the average increase in weight being about 1 gram a week. The maximum variation in length between the largest and smallest specimens was only 19 millimeters, while in other ponds variations in length as great as 111 millimeters were recorded.

These results are of great interest for comparison with those obtained at Fairport, since the methods employed were very different. The production of approximately 15,500 fingerlings per acre was no greater than has been obtained at Fairport, but the growth was more rapid, due, no doubt, to the heavy fertilization, which greatly exceeded anything which has been attempted in the ponds at that station.

The results also show that when sufficient numbers of Daphnia and insects are available bass can be reared successfully to a length of 3 inches or more without the use of forage fish. It is doubtful, however, if under ordinary conditions these animals can be raised in sufficient abundance through the summer to supply the needs of fingerling bass when the ponds are heavily stocked.

During the season of 1932 it is planned to carry on a series of experiments at Hackettstown to determine the relative value of Daphnia as the principal item of food throughout the summer as compared with forage minnows.

## TROUT CULTURE

### PITTSFORD STATION

As previously stated, the investigations relating to trout culture have been conducted at the experimental hatchery at Pittsford, Vt., which is operated under the direction of Russell F. Lord. These investigations include feeding experiments with both fingerling and yearling trout, selective breeding for the purpose of developing a superior strain of brook trout, and studies on trout diseases. Some field work is also being carried on, which includes a study of the natural food of trout throughout the year and the tagging of trout liberated in certain streams.

Construction work during the past year was confined to extensive repairs to the hatchery, which was in very bad condition, and minor repairs to several other buildings.

*Feeding experiments.*—As in previous years, fingerling brook trout from the same general stock of eggs were divided into lots each containing 1,500 fish. Each lot occupied a standard hatchery trough and was carried on an experimental diet from May 5 to September 3. Throughout the summer samples of fish were counted out and weighed at 2-week intervals.

Emphasis was laid on the further testing of dry products, which appear to offer the best possibilities as trout foods. A record was kept of the amount of food fed each lot of fish and its cost. In every case the fish were fed all they would eat without waste. No tests were made of straight meat diets, since sufficient data on these foods have already been secured. Beef liver was in most instances used in combination with the dry products, but with salmon eggs it was thought desirable to use other meats as well. Since beef liver

has been shown to give the best growth of any meat ordinarily used at hatcheries, it was fed to the control lots and was the only meat used straight.

It is interesting to find that the growth obtained with mixtures of meat and suitable dry products has each year approached more closely or even surpassed that obtained in the controls, and this year all the diets, with three exceptions, gave a greater growth than beef liver. The results show very clearly that there are now a number of dry products which, when fed in combination with fresh meat, are superior to a straight meat diet and cost considerably less. In other words, by the use of dry products it is possible to produce better fish for less money than can be produced on the standard hatchery diets in common use.

The outstanding feature of the feeding experiments for 1930 was the excellent growth and high color secured with dry salmon eggs. For this reason it was planned to give the salmon-egg meal a thorough test in the 1931 experiments and eight rations were made up with the meal incorporated in various proportions. In general the results of these experiments fully confirmed the conclusion reached in 1930—that in proper combinations salmon-egg meal makes the best trout food now available. As is to be expected, the best results were obtained with a mixture of salmon-egg meal and beef liver. The meal was used at 30 and 50 per cent levels, but the results show that 50 per cent of salmon eggs is too high for small fingerlings, although it can be safely used after the fish reach a length of 3 to 4 inches. With small fingerlings a considerable percentage of the meal is uneaten if more than 30 per cent is used in the mixture. In general the smaller the fish the greater the difficulty in feeding dry products, and in ordinary hatchery practice there is probably little to be gained in attempting to feed such products before the young trout are about 2 inches long.

The fish fed a mixture of sheep liver and salmon eggs made a slightly greater growth than those on beef liver mixture, but the mortality was higher. Data secured in previous experiments indicate that sheep liver is inferior to beef liver for brook trout when fed straight, but that in combination with certain dry products it gives much better results than when fed alone. Pig liver when used with salmon eggs was somewhat inferior to either beef or sheep liver, but owing to its lower cost it may be found advisable to use it with the larger fingerlings. For some reason a mixture of pork melts and salmon eggs proved a complete failure—the fish refuse to eat it and suffered such a heavy loss that the lot was discontinued early in July.

The superiority of salmon eggs rests not only on its ability to produce rapid growth but also on the fact that fish reared on this product show exceptional vigor and remarkably brilliant coloration. As might be expected, the latter is more marked in yearling than in fingerling fish, but is very noticeable at any age. It has also been found that an equally marked improvement in the color of rainbow and black-spotted trout follows the use of salmon eggs. This was especially noticeable in a lot of yearling rainbows, which showed a remarkable development of red and orange hues before the end of the summer.

Fish meals of various kinds have been used extensively in previous experiments and, on the whole, have given quite satisfactory results. This is especially true of the vacuum and steam-dried meals, which are superior to flame-dried and more uniform in quality. A haddock meal dried by a new process at low temperature gave excellent results in combination with beef liver. In fact, this mixture gave the best growth that has been obtained with any fish meal and was only slightly behind the salmon eggs in this respect. The mortality was also very low.

In previous years several attempts have been made to carry experimental lots through the summer on dry foods alone, but all such attempts have ended in failure. During 1931 another attempt was made to keep fingerling trout on a ration containing no fresh meat. These fish were fed a ration composed of 58 parts dextrin, 34 parts haddock meal, and 8 parts dry beef liver. The haddock meal and beef liver were dried by the special low-temperature process referred to above. The fish made a good growth, and for the first time in the history of these experiments it was possible to carry them through the summer without feeding any fresh meat. The mortality, however, was higher than normal, and it is not believed that the use of this ration for any length of time is to be recommended.

In addition to the experiments with fingerling trout, 20 lots of yearling brook trout were placed on experimental diets May 27 in small outdoor pools. These experiments were to have been continued through the summer, but owing to an unsuitable water supply this was found to be impossible. Unlike the hatchery troughs which are supplied with spring water, the only supply for these pools is from a neighboring brook. On account of exceptionally hot, dry weather early in the summer, the temperature of the brook rose to 72° F. This brought on an epidemic of furunculosis, which caused such a heavy mortality—in one lot reaching 86 per cent—that the experiments were discontinued on July 9.

Although these experiments with yearling brook trout were carried on for such a short time that the results are of little value, there is one aspect of the case which is of more than passing interest. During the previous summer there was some evidence that the inclusion of salmon eggs in the diet tended to make the fish less susceptible to furunculosis, and experience with the yearling trout strongly supports this conclusion. With one exception, the fish which showed the lowest mortality were on diets containing 50 per cent of salmon eggs. The single exception was a lot fed a mixture of equal parts salmon eggs and pig melts, in which the mortality was double that of any other lot receiving an equal amount of salmon eggs. As previously mentioned, this ration resulted in such heavy mortality with fingerling trout that it was discontinued early in the season. There can be no doubt that the lower mortality in the lots fed salmon eggs was due to the food, since in all other respects the experimental lots were treated alike.

*Breeding experiments.*—The work on selective breeding, which was started several years ago, has been continued along the same general lines as in previous years. Although it will be some time before the full possibilities of this work will be evident, each year shows a marked advance in the results attained. Progress would

have been even more rapid had it not been for the occurrence of furunculosis, which has caused serious losses among the selected fish. It is hoped that eventually it will be possible to develop a strain of trout more resistant to this disease than the average fish, but it is too early to predict how successful this attempt will be.

As in previous years, a number of selected fish were mated, and the progeny of each pair will be reared separately until it is determined if they possess any points of superiority. In addition to selecting such characters as fecundity, rapid growth, vigor, and resistance to disease, a special attempt is now being made to develop an early-spawning strain of fish. Such a strain would possess many advantages, especially in the extreme Northern States. During the fall of 1931 eggs were taken from 56 pairs of selected fish. Several of these showed an exceptionally high percentage of eyed eggs and one 4-year-old female yielded 2,557 eggs, 97 per cent of which eyed.

In this connection it is interesting to note that the average size of fingerling brook trout at the Pittsford station has increased each year from 1,630 grams per 1,000 fish in 1928 to 5,189 grams in 1931. Of course, this increase in size is partially due to the use of better rations, but that the greater part is due to improvement in stock as the result of selection is evident from a comparison of the experimental lots fed beef liver as shown in the following table:

| Year | Weight in grams per 1,000 fish | Date when weighed |
|---|---|---|
| 1928 | 2,174 | October 15. |
| 1929 | 2,893 | September 24. |
| 1930 | 3,707 | September 3. |
| 1931 | 4,421 | September 3. |

We can not, of course, hope to increase the size of trout fingerlings indefinitely, but there can be no question that by constant selection of the brood stock and by the use of improved foods it will be possible to produce trout of catchable size in a much shorter time than at present.

### LEETOWN STATION

Construction work at the new experimental station at Leetown, W. Va., was started in the spring of 1931. This station is located on a tract of approximately 150 acres, watered by several springs with a combined minimum flow of over 2,000 gallons per minute. It is planned to operate this plant as a trout and pond station; but owing to lack of funds for developing the property, it will be impossible to do any pond-cultural work at present. Eventually, however, there will be between 75 and 100 acres of ponds devoted entirely to experimental work with warm-water fishes.

The main building, which is designed primarily for a trout hatchery, is now practically completed. This building is constructed of native limestone and is approximately 125 feet long by 40 feet wide. The middle section contains 60 standard hatching troughs on the ground floor, with offices, library, photographic room, and storage rooms on the second floor. Wings at each end of the building contain the laboratories and a public aquarium. Immediately in the rear of the main building is an old gristmill which has been remodeled to serve as a garage, carpenter shop, and meat room. A

short distance below the hatchery there is adequate space for the construction of a series of trout pools which will be used for experimental purposes and also for holding brood stock.

The trout work at this station will be devoted primarily to rainbow and brown trout, although brook trout will also be reared in considerable numbers. The Pittsford station, however, will continue to serve as headquarters for work with this species. As soon as sufficient brood fish have been reared it is planned to undertake selective breeding with rainbow and brown trout along the lines which have given such promising results with brook trout. It is also planned to undertake extensive feeding experiments, which will be continued throughout the year. In accordance with this policy approximately 500,000 rainbow, brown, Loch Leven, and brook trout have been hatched at Leetown, and a large percentage of the young fish will be held over the summer. This will insure an adequate supply of material for experimental work.

## FISH DISEASES

*Herring disease.*—An investigation of a disease of the herring in the Gulf of Maine was begun early in 1931 and continued through the summer. This investigation was carried on in cooperation with the division of inspection of the Maine State Department of Agriculture, and the greater part of the expenses of the investigation was defrayed by the State.

During the winter and spring of 1931 a laboratory was maintained at Eastport, Me., where investigations were carried on by Dr. Frederic F. Fish and George E. Daniel. Later the laboratory was transferred to the Bureau of Fisheries station at Boothbay Harbor, Me., where much better facilities were available than at Eastport.

As a result of these investigations it was found that the disease in the herring is caused by a fungus of uncertain affinities known as *Ichthyosporidium* or *Ichthyophonus*. In addition to the herring (*Clupea harengus*), the parasite has been found on the flounder, alewife, and smelt. The herring, however, appears to be the natural host, infection in other species being apparently accidental.

The parasite occurs in all parts of the body, but is especially abundant in the heart, liver, and lateral-line muscles, and forms large, spherical, multinucleate cells, which are surrounded by a thick membrane. These spherical bodies or cysts occur in groups bound together by a heavy connective-tissue capsule.

Further development of the cysts takes place by the formation of a small circular opening in the wall, through which the protoplasm extends to form a short, branched hypha covered with a thin transparent membrane. The contents of the hypha break up into a number of discrete bodies, the structure of which is practically identical with that of the mother cyst. After the formation of the secondary cysts the tip of the hypha breaks open and the cysts are liberated. Such a process results in the liberation of a large number of bodies into the musculature of the fish, each of which can repeat the process by which it was produced.

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In some cases instead of forming hyphæ the contents of the cyst may divide into a number of daughter cysts, similar to those produced in hyphæ, by a process of endogenous budding. Later the cyst wall ruptures and the daughter cysts are set free in the surrounding tissues. Once the infection is established, the mode of diffusion of the parasite within an organ is not difficult to understand, but the means by which the infection spreads from one organ to another within the host is not so evident. It seems quite reasonable to assume that migration occurs through the circulatory systems, either lymph or blood, but so far it has been impossible to demonstrate such a process.

As a result of the development of the parasite within the host the surrounding tissues become necrotic, and in severe infections may disintegrate to form a puslike material which may be eliminated through an opening in the skin of the fish.

The development of the parasite is very slow, and it probably requires weeks or even months for it to become disseminated throughout the body of the host. In many cases the multiplication and dissemination of the parasite through the tissues appears to proceed gradually until every part of the body is affected and the host becomes so weakened that it eventually dies, or more probably is caught by one of its numerous enemies. In some instances even badly infected fish may completely recover and groups of parasites in various stages of resorption are by no means rare. The extent, however, to which normal recovery takes place is unknown at present.

Transmission of the parasite from host to host is probably effected by the heavy-walled cysts which are thrown off in large numbers through openings in the skin of infected fish. These cysts float about in the water and could readily be swallowed by another fish. There is no reason to believe that an intermediate host is involved in transmission of the infection. The evidence at hand indicates that the infection is much more prevalent among herring that have been in inshore waters for some time where there are better opportunities for the spread of the parasite. Apparently fish in offshore waters are usually relatively free from the disease.

*Trout diseases.*—Studies on furunculosis were continued by Doctor Davis at the Pittsford station. An investigation of an undescribed eye disease which was quite prevalent in several lots of fingerling trout was also begun. The first indication of this disease is a slight congestion of the blood vessels on the lower side of the eyeball. A little later irregular elevations appear on the cornea due to proliferation of epithelial cells. Eventually the entire cornea becomes thickened and opaque and more or less distended due to the accumulation of fluid between it and the iris. In some cases the cornea may disintegrate, allowing the fluid to escape into the surrounding water. In advanced stages of the disease the lens disintegrates and the entire eyeball becomes greatly shrunken.

Only the eyes are affected, and numerous instances were observed where the fish became totally blind but were apparently perfectly healthy in every other respect. The cause of the disease has not yet been determined.

It was found that the spread of the disease was checked by transferring the fish from hatchery troughs to outdoor raceways. After

the transfer the eyes of fish already affected continued to degenerate, but no new cases of the disease could be found.

*Parasites of Great Lakes fishes.*—During October and November, 1931, Dr. Frederic F. Fish made a preliminary survey of the extent of infestation with the larval stage of the cestode *Triaenophorus robustus* among fishes of the Great Lakes. This parasite was found to present a serious problem in the tullibees and whitefish of Lake of the Woods, the lake herring and whitefish of Rainy Lake, the lake herring of western Lake Superior, and the lake herring and chubs of the Green Bay region of Lake Michigan. The parasite was found to a lesser extent in the lake herring taken at Cheboygan, Saginaw Bay, and Marquette, Mich. Other fish, including the pike-perch, pike, pickerel, yellow perch, sauger, black sucker, redhorse sucker, bullhead, carp, crappie, and cisco, were examined in several localities and were found to be uniformly negative.

Lake Erie was found to be free from the parasite. Lake Ontario was not visited, but there is no reason to suppose that the parasite occurs there.

## CALIFORNIA TROUT INVESTIGATIONS

Early in the year arrangements were made with the California Division of Fish and Game for a cooperative trout study in that State. In March a meeting of the members of the bureau's staff who are working on trout propagation was held in Washington, and an outline was made of those lines of investigation which promised to be of most help in maintaining the western game fishes under the constant increase in angling which has followed the extension of roads and the development of the automobile.

Three major lines of investigation were proposed:

(1) A study of the development of a domestic brood stock as a source of eggs.

(2) Investigation of the problems involved in raising larger fish for planting.

(3) The development of a stocking policy through stream surveys.

Active work on this program was started in May. This preliminary work has included a survey of certain streams with a view to selecting those which are suitable for experimental work. In the course of this work streams have been studied in the four geographical groups into which the streams of the State may be divided, viz, the streams of the eastern slope of the Sierras, of the western slope of the Sierras, of southern California, and of the Coast Range from Monterey north to the Oregon line.

Data have been gathered also regarding the development of selected brood stock as a source of eggs. This has included a study of the present brood stock in the State and the characteristics of the wild stock from which eggs are now derived.

It was not possible to start selected brood stocks during the present season, as no sites were available for holding such fish, but plans have now been formulated which will make it possible to carry on this work during the coming year. There is a particularly pressing need for the development of a source of brown-trout eggs in southern California, and it is now planned to use for this work certain storage reservoirs which are not subject to great fluctuations in level.

The development of a brood stock and the raising of larger fish for planting are both largely dependent upon the availability of suitable water. This problem is particularly acute in California, where practically all the water at low elevations is stored or diverted for irrigation.

An excellent site for this type of work has been developed at Hot Creek, in Mono County, which is on the eastern slope of the Sierra Nevada Mountains. Warm springs arise along the course of this stream which have a constant temperature of 60° F. and a flow of about 30 second-feet. The gravel bed of the stream is covered with water cress and other aquatic plants. Fish food is abundant in the form of the amphipod *Gammarus ramellus*, which is present in numbers up to 1,000 per square foot of stream bottom. The terrain is such that ponds can be constructed and maintained at low cost. During the latter part of the year two experimental ponds were constructed at this place. Due, however, to a heavy fall of snow in December, it was impossible to stock these ponds during the present year. There is sufficient water at Hot Creek to allow of the establishment of both brood stock and fingerling ponds.

Two streams have been selected for the study of the life history of the steelhead, including the study of the migratory movements of the young fish through marking and by monthly sampling in the upper parts of the streams and in the lagoons. This work has been somewhat hampered by exceptionally heavy rainfall and the consequent flooding of the streams, but work is also being done on the migration, growth rate, and egg production of the adult fish through tagging.

## LIMNOLOGICAL INVESTIGATIONS IN THE NATIONAL PARKS AND FORESTS

Following conferences early in the year 1931 the Bureau of Fisheries announced recognition of its responsibility in stocking the public domain with food and game fishes, and plans were made for active cooperation with the Forest and Park Services to fulfill that responsibility in a competent manner. As its specific duties the bureau proposed to undertake scientific surveys of forest and park waters as a basis for drafting a national program of fish planting, and plans were made for the Forest and Park Services to cooperate with the bureau in the planting of fish in accordance with an orderly plan of stocking. To carry this out the bureau proposed to organize in each of the national-forest areas of the United States investigations under a competent biologist who should conduct and supervise stream and lake surveys in the waters of the public domain, and who should develop therefrom a rational policy of stocking such waters with fish.

A preliminary survey of the lakes and streams of Wasatch National Forest in Utah was conducted during the summer of 1930, and in June, 1931, a permanent investigator of the bureau, Dr. A. S. Hazzard, was placed in charge of stream surveys in the intermountain region.

The primary purpose of these studies is to collect basic physical, chemical, and biological data on the lakes and streams of these areas and to interpret these data in the form of systematic stocking pro-

grams to meet the increasing demand for game fish in public waters. Along with this immediately practical program, fundamental studies concerning production of fish food and fish in unit areas of water of different types are being planned. The ecology and distribution of the little-known fishes of the Rocky Mountain region are being investigated as a part of the survey work in these areas.

### WASATCH FOREST INVESTIGATION

The Wasatch forest has been designated as an experimental area in which fish-cultural experiment and stocking programs can be carried out to the ultimate benefit of the entire Rocky Mountain region. As a basis for this work, a preliminary biological survey of representative lakes and streams was undertaken. Collection of the field data during the seasons of 1930 and 1931 was made by Prof. Vasco M. Tanner, of Brigham Young University, who, with a staff of four assistants, spent the months of July, August, and September in a reconnaissance survey of the representative lakes and streams of this area. During the first season 86 lakes and a few streams were examined. The summer of 1931 was devoted primarily to a study of the principal stream systems, although some lake study was also carried out. A total of 107 lakes and 34 stream systems were examined during the two seasons.

*Lake studies.*—The majority of the lakes of the Wasatch Forest lie at elevations from 9,500 to 11,500 feet. The growing season for most forms of aquatic life, including the trout, probably does not exceed four months, judging by the fact that the ice does not disappear from the majority of the lakes until June and begins to form early in October.

Although locally termed as lakes, these bodies of water are all relatively small, varying in size from 1 to 160 acres and having a total area of only 1,715 acres. They are for the most part shallow lakes of glacial origin.

The entire drainage area being in pre-Cambrian quartzite, the water is extremely soft, varying in pH from 4.9 to 5.5, with a bicarbonate content of from 5.5 to 15.2 parts per million. Dissolved oxygen of the surface water varies from 6.2 to 8.9.

The lakes studied, classified according to the type of shore, are: Rocky, moorland or boggy, and reservoir lakes. Although intermediates between the first two classes are common, the latter type, though a man-made class, is quite distinct in chemistry and biota. The first class is characterized by rocky shores and bottom; shallow, clear water rich in oxygen and exceedingly low in carbonates and a sparse fauna and flora. The boggy-shore type is found in stream valleys, usually surrounded by boggy meadows. These lakes have mucky bottoms, and the oxygen tends to be reduced in the deeper waters due to the decomposition of organic matter and to the small size of tributary streams. A fair abundance of a few species of organisms makes up the food supply. The reservoir type is usually the result of damming originally boggy-shore lakes to increase their storage area for irrigation purposes. Great fluctuation in water level occurs in contrast to the fairly constant area of the other types. Food of the bottom and plankton types is quite abundant at low-water stages, probably due to concentration with decrease in area.

In general, all of these lakes contain a limited supply of food, probably due to the short growing season and the low lime content of the waters. Some of the rock-rimmed lakelets at the higher altitudes were considered unsuitable for trout because of the extremely limited food supply. The boggy-shore lakes were held to be unsuitable if tributary streams were lacking, and the process of filling had advanced too far. However, a good proportion of these types, as well as the type intermediate between them, should provide for a limited number of trout. The reservoir type is considered suitable for a moderate number, depending upon the level to which the waters are reduced.

The only fish native to the region and naturally present in lakes not separated by impassable falls from lower waters is the cutthroat trout, *Salmo pleuriticus* Cope. No forage fish such as minnows and whitefish were observed in any of the lakes, and their introduction is considered as a possible means of improving production. Many of the lakes were formerly barren of all fish life. Rainbow, eastern brook, and Yellowstone cutthroat have been introduced into some of these lakes, and where the plantings were moderate have made good growth. Food studies of 153 specimens of trout of lakes show no noticeable difference in diet among the species represented, the food taken by native cutthroat, eastern brook, and rainbow consisting of 25 per cent terrestrial and 75 per cent aquatic organisms. Midge larvæ, pupæ, and plankton crustacea comprised the bulk of the aquatic food; ants, the bulk of the terrestrial food.

*Stream studies.*—Five drainage systems are located in the Wasatch Forest: Provo, Weber, Bear, and Duchesne Rivers and Rock Creek. The headwaters of these streams are very rapid and the pools are narrow, shallow, and infrequent. The pH varies from 5.1 to 5.6 and the bicarbonate content from 7.3 to 12.6 parts per million; food organisms are extremely scarce. In their lower reaches, near the forest boundaries the gradient becomes less steep, the pools improve in type and abundance, and the fish food undergoes a marked increase. The latter appears to be associated with a marked change in the solution content of the waters due to the occurrence of limestone outcrops within the drainage area at the lower elevations. The bicarbonate content of the streams below 8,500 feet elevation varies from 18.3 to 56.7 parts per million.

Stomach examinations of stream trout showed a larger percentage of terrestrial food in the case of cutthroat trout and eastern brook trout than was consumed by these species in the lakes. As in the case of lake fish, ants formed the bulk of the terrestrial food. Caddis larvæ made up 35 per cent of the food of stream trout, with mayflies, midges, and stoneflies next in order of importance in the aquatic food list. One sculpin and one young trout had been taken by these fish.

The principal conclusions to be drawn from the stream studies is that stocking of trout should be largely confined to the lower waters where food and pool conditions are suitable, but detailed tables of the species, sizes, and numbers of fish and the frequencies of planting in the various waters have been prepared for the use of the fish-cultural staff.

TETON NATIONAL PARK INVESTIGATION

The biological survey of the waters of the Grand Teton National Park is the first of a series planned for the national parks in order that systematic stocking plans for these waters may be devised.

Field work was conducted from July 20 to September 20. An exchange of personnel was effected between the members of the Wasatch and Teton survey parties for a part of the season in order that the work in these areas might be better coordinated.

Six lakes, from 60 to 1,360 acres, with a total area of 3,443 acres, afford the principal fishing in this park. The streams within the park are too small and precipitous to afford much angling, although they are extremely important in furnishing the only successful spawning grounds for the cutthroat trout of the lakes.

Studies of aquatic plants, plankton, littoral, and benthic organisms were made. Studies of temperature, depth, type of bottom, and clemical relations were undertaken. The fish population was investigated, and collections of fish stomachs and scale data secured from 145 specimens of cutthroat trout. A preliminary survey of Jackson Lake was also made which included extensive soundings and fish collections.

A systematic stocking plan is being formulated for these waters based upon the data secured during this survey.

With two exceptions, the lakes of this area were found to contain considerable water over 50 feet in depth. Abundance of oxygen and small amounts of carbon dioxide were found in all but one of these lakes. The large volume of the cold tributary streams and the scarcity of organic material are responsible for this condition. The waters of the park are acid for the most part and contain small quantities of bicarbonates, with the exception of the southernmost lakes and streams which drain some areas of limestone formation in contrast to the igneous and metamorphic rock which make up the drainage areas of the more northern waters. A marked superiority in the quantity of aquatic fauna and flora was noted in these more southern waters.

The present reduction in the trout population in the Teton lakes is believed to be due to the increase in angling, lack of sufficient artificial plantings, and to the scarcity of suitable spawning beds for the cutthroat trout. Gill netting, seining, and observation failed to show the presence of young trout, smaller than 7 inches in the lakes, although fry and fingerlings were common in the inlets and outlets of the lakes. Impassable falls near the lakes limit the spawning areas to a few hundred yards in most cases. Consistent stocking should show a marked improvement in the angling in these lakes in the near future.

Studies of 109 cutthroat trout of lakes and 36 of streams show a marked difference in the food habits of this species, depending upon size and environment. Fish are unimportant in the diet of stream trout of the sizes taken, due in part to the scarcity of this type of food here. Aquatic insects formed approximately 75 per cent of the food; terrestrial insects 25 per cent. In lake fish aquatic insects formed 3 per cent by volume, terrestrial insects 7 per cent, plankton crustacea 10 per cent, and fish 60 per cent, indigestible and unidentified material contributing the balance. Fish formed the largest

item in the diet of the lake fish after they had attained a size of about 12 inches. Up to this size plankton crustacea formed about 25 per cent of the food. From this it is evident that the larger cutthroat trout consume considerable numbers of forage fish where they are available. Stomach examinations of 46 fry of this species showed a great variety of diet, with the larvæ of Chironomous forming the most important item.

## OYSTER INVESTIGATIONS

During 1930 investigations relative to various phases of oyster culture were carried out along the Atlantic and the Pacific coasts, the staff of the investigators being more or less evenly distributed in different oyster-producing sections. In New England waters the headquarters for oyster investigation remained, as in previous years, at the Fisheries Laboratory at Woods Hole, where work on physiology of spawning has been continued. Cold Spring Harbor Biological Station, on Long Island, was selected as a suitable place for an experimental study of the control of starfish. The Beaufort (N. C.) laboratory served as the headquarters for South Atlantic investigations, which were greatly expanded during the last year and extended from North Carolina to Florida. On the Pacific coast a study of the life history and cultivation of the west coast oyster, *Ostrea lurida*, was continued. Thanks to the cooperation with the Washington State Department of Fisheries and Game, a small but well-equipped laboratory located in the center of the oyster industry near Olympia was made available for the bureau's investigators. In cooperation with the State authorities of Oregon and California, a survey of local oyster bottoms and experiments on oyster culture were made.

### PHYSIOLOGY OF SPAWNING

A study of factors that control spawning is of paramount importance for the successful cultivation of oysters.

The results of the large number of experiments with *O. virginica* carried out by Dr. P. S. Galtsoff from 1927 to 1929 show that no spawning occurs below 20° C., whereas the same specimen can be induced by sperm to spawn as soon as the temperature has been brought above 20°. In a few instances it has been noticed that oysters spawned at 27.5° without being stimulated by sperm. Inasmuch as in those cases unfiltered water was used, the possibility of its contamination with sperm was not excluded. In the experiments with *O. gigas* it has been found that a ripe female can be induced to spawn by a temperature of 30° C. The question naturally arises whether the same results could not be obtained with the other species. During the summer of 1931 experiments were carried out at Woods Hole with ripe *O. virginica* which were kept in aquaria at a temperature of about 20°. To avoid possible contamination the water used in the experiments was filtered through a layer of asbestos about three-quarters of an inch thick. The results of the experiments indicate without any doubt that ripe females can be induced to spawn by placing them in water having a temperature from 24.5° to 30° C. At 31° the females usually close their valves and remain closed until the temperature drops to 30° or 29° C.

The latent periods of spawning reactions—that is, the time elapsed from the moment the oyster was exposed to a given temperature until the beginning of spawning—varies from 20 to 257 minutes and apparently is not correlated with the temperature, the quickness of the response probably depending on the condition of the organism itself.

The fact that the females can be stimulated by a temperature of 24.5° C. or higher suggested the possibility that similar effects might be obtained by a longer exposure to temperatures between 20° and 24.5° C. The results of a large number of experiments, of which only three will be described here, show that this is very doubtful. On July 10, three ripe females were taken from the tank, in which the temperature during the previous week fluctuated between 18.5° and 19.5° C. and placed in an aquarium filled with filtered sea water. The temperature was kept at 22.6° but occasionally rose to 23.4°. The shell movement of each oyster was recorded on the kymograph. The first oyster was kept for 5 hours and 22 minutes, the second for 29 hours and 53 minutes, and the third one for 73 hours and 13 minutes. The water in the aquaria in which the second and third oysters were kept was changed twice a day. None of the oysters spawned during that time, but each of them spawned after sperm were added to the water, the latent periods being 16, 24, and 15 minutes, respectively.

It is interesting to note that in both cases of stimulation, either by the temperature or by the sperm, the reaction is alike and is characterized by a series of rhythmical contractions of the adductor muscle and of the mantle. From that an inference can be made that both factors release some mechanism in the organism of the female which in turn stimulates the muscle and causes the discharge of eggs from the ovary. In this respect the reaction is not specific. It is, however, specific in the sense that sperm of other mollusks (Mya, Mytilus) fail to induce spawning of the oyster. No positive results were obtained also when the sperm of *O. cucullata* was added to the female of *O. virginica* and vice versa.

From a biological point of view stimulation of spawning either by the temperature or by the sperm-and-egg suspension is of great interest. It provides a mechanism which insures successful propagation of the species. Should the temperature of the sea water fail to reach the effective point which would induce shedding of eggs by the females, still the spawning of the latter could be provoked by the sperm discharge of the males, which are more susceptible to the increase in temperature. In most of the cases observed by Doctor Galtsoff, when several oysters were kept together the males spawned first and induced the shedding of eggs by the females. The process, once started, spreads by mutual stimulation of the two sexes throughout the whole oyster bed and results in simultaneous spawning of the oyster population.

## SOUTH ATLANTIC OYSTER STUDIES

Investigations and experiments of a practical and scientific nature are being conducted from North Carolina to Florida under the supervision of Dr. H. F. Prytherch, director of the Beaufort (N. C.) laboratory, which serves as the headquarters for this work. In

cooperation with the State shellfish commissions and various oyster producers, small experimental oyster farms have been established in each State for the purpose of determining and demonstrating the most efficient methods for oyster culture in each particular region. The production of oysters for both the canning and raw trades are important industries in this region, and the industry is cooperating in this work with a view to improving the size, quality, and quantity of oysters grown for these purposes.

In this section a greater industry and market for raw oysters can be developed not only by increased production of large oysters but especially through improvement in the methods of opening oysters and their preparation for market or shipment. The latter is particularly important in this warm climate and consequently experiments along this line have been undertaken at the Beaufort laboratory, which, as described later, show excellent possibilities for supplying the market with oyster meats in a fresh sanitary condition.

The results of the experiments in oyster farming in the South Atlantic region are described briefly according to the States in which these operations were conducted.

*Relation of copper content of water to oyster setting in the South Atlantic.*—Previous studies in the North have shown that the copper content and salinity of the water are the chief factors controlling setting and the production of seed oysters. Further investigations show that a similar relationship also exists in North Carolina, South Carolina, and Georgia. Chemical analyses of the water in these localities showed the presence of copper in amounts varying from 0.05 to 0.4 milligram per liter. The heaviest setting was found to occur at the surface of the water during the stage of tide when the copper content was highest. Partition collectors placed at such tidal levels gathered from 1,200 to 3,500 seed oysters per collector.

In southern waters the reproduction and setting of oysters is so abundant as to constitute the greatest handicap to their cultivation. Usually there are two crops of seed each summer, which fasten chiefly upon the adult oysters and so seriously interfere with their feeding and growth as to kill them or produce an inferior oyster. Consequently the studies on setting are being continued in the hope of finding a practical means for controlling or preventing the heavy setting of oysters in certain areas. While copper in minute amounts is beneficial for setting, it also true that slightly higher concentrations of this metal are decidedly toxic to the oyster larvæ. Experiments are in progress to determine the practicability of using copper salts or other toxic substances to prevent the overcrowding and inferior growth of oysters in southern waters as a result of heavy setting.

*Improved methods in the preparation of oysters for market or shipment.*—The shucking of oysters and their preparation for market are costly operations and of considerable importance in determining whether the consumer will receive this valuable sea food in a first-class physical, chemical, and sanitary condition. Experiments conducted at the Beaufort laboratory by Drs. Vera Koehring and H. F. Prytherch give promise of developing an inexpensive and efficient method of removing oyster meats from the shell more quickly, with less difficulty and labor, and particularly with little

or no injury to the oyster tissues. The method may be of further value from a sanitary standpoint, as the medium employed inhibits the growth of spoilage organisms and leaves the meats in better condition for shipment.

In removing the meats by this method the oyster muscle is "put to sleep" or narcotized. Relaxation of the muscle occurs, and the valves of the shell are automatically pulled apart by the pressure of the hinge so that an oyster knife can be easily inserted and the muscle severed from the shell with less injury to the meat than by present methods. The narcotization of oysters is accomplished by the use of a small amount of certain mineral and organic acids in combination, which in experimental procedure costs less than 10 cents per thousand oysters. Oysters may be completely narcotized or caused to gape within a period of six hours, and can be kept without injury in this condition for a considerable length of time. In the experiments conducted thus far the number of completely narcotized oysters in each lot treated has varied from 60 to 90 per cent. In this connection the type and concentration of the chemicals employed are important and further studies are in progress to improve the technique of administering the reagents and test the method on a small commercial scale.

An important feature of this process is that it is not injurious to the oysters, as they fully recover when returned to fresh sea water and may be treated several times in this manner without deleterious effects. The chemicals employed do not cause shrinkage or volume losses of the meat nor impair their food and market value. Narcosis is obtained by using higher concentrations of chemical substances which normally occur in the body and environment of the oyster. Various inorganic and organic reagents are being tested from a practical standpoint to determine their relative efficiency and value for opening oysters. Those in use at present appear to largely disinfect the oyster meats in the process of opening and keep them fresh, firm, and in excellent condition, free from decomposition, for a long period after treatment. The bacteriological phases of the narcotization process will be studied in greater detail later in respect to the purification of oysters both shucked and in the shell. It appears likely that the principles employed in opening oysters by chemical means can likewise be used to improve the keeping qualities of oyster meats in shipment. In the southern climate particularly such improvement is needed and will greatly aid the marketing of oysters and development of the industry.

*Oyster investigations in North Carolina.*—During the past summer a general survey has been made of the oyster-producing areas in the vicinity of the United States Fisheries Laboratory at Beaufort, N. C., in order to determine the most suitable methods for the development of oyster culture in this region. Experiments and chemical studies dealing with the setting of oysters and the collection of seed have been made in cooperation with Capt. John A. Nelson, State fishery commissioner.

Various types of collectors for gathering seed oysters have been tested on experimental grounds in Core Creek, Newport River, Oyster Creek, and at the United States Fisheries station at Beaufort. In Core Creek a very good crop of seed oysters was obtained on cement-

coated tubes and partitions that were planted there on July 23. The partitions were planted just above low-water mark on a natural oyster bed and gathered from approximately 100 to 500 seed oysters per collector. The cement-coated tubes are a new type of spat collector that was developed here during the past summer for gathering set on soft mud bottoms where shells and partitions can not be used. Tubes 2 feet in length and 1½ inches in diameter proved to be the most satisfactory size and collected from 200 to 300 spat each. They were planted vertically in the soft mud bottom surrounding the oyster reefs and were most heavily covered with spat when set out at low-water level.

The heaviest setting of oysters in this region occurs in a narrow 1-foot zone just above low-water mark, and has been found to be due to the higher copper content of the water at this stage of tide. Chemical analysis of the water showed the presence of copper in concentrations of 0.3 to 0.4 milligram per liter and a salinity of 15 to 18 parts per thousand during the tidal period when the setting of oysters was most pronounced. At other stages of tide when setting did not occur the salinity of the water was high (30 to 33 parts per thousand) and the copper content less than 0.05 milligram per liter. Therefore, in planting seed collectors of any kind in this region it is obvious that particular care must be taken to select the zone in which heaviest setting occurs.

A study of oyster distribution along the shores of Core Creek and canal revealed a new kind of brush that can be utilized for gathering seed oysters on the adjacent mud bottoms. The branches and trunk of the myrtle were found to be excellent for this purpose and were densely covered with well-shaped, rapid-growing oysters of different ages. Experiments with this brush will be made here during the coming year.

In Oyster Creek partition collectors were planted on June 17, by Inspector Robert L. Willis, of the State fisheries department. They were elevated a few inches above the bottom on stakes and gathered a light set of approximately 200 seed per partition. Setting in this locality is rarely heavy, which makes it a particularly valuable area for the growing and maturing of large, well-shaped oysters for market.

The partitions and tubes planted on Cross Rock in Newport River likewise collected during the latter part of July a light set similar to that observed on the shells covering this oyster reef. This bed produces a good grade of oyster, but is not as favorable a location for seed collection, as the near-by coon oyster areas.

At the fisheries laboratory the setting of oysters has been more or less continuous from the first week in June up until the first of October. Two plantings of partitions were made and collected a crop of seed oysters ranging from 200 to 1,500 per collector. The heaviest setting was found on partitions planted from low-water mark to 2 feet above and is governed by the lower salinity and higher copper content of the water during this stage of tide. Chemical analysis showed that at such times copper was present in concentrations of 0.15 to 0.20 milligram per liter and served as a pronounced stimulus for the setting of the oyster larvæ.

In summarizing these studies it is evident that partitions, tubes, and brush are commercially practicable as devices for collecting seed oysters in North Carolina waters. When planted on suitable bottoms they can be utilized for gathering an almost unlimited supply of seed of fine quality, which is the first essential requirement in successful oyster culture. The second requirement is the transplantation of the seed to selected growing and maturing bottoms where setting does not occur and interfere with the development of single, well-shaped oysters. Studies of this second phase of the problem are just being started through a series of cruises with the new State boat and United States Fisheries craft to the chief oyster-producing areas in North Carolina. In various localities suitable oyster-growing bottoms will be selected and used as experimental seed-planting grounds.

*Oyster investigations in South Carolina.*—Preliminary studies have been made at three representative oyster-producing areas in South Carolina for the purpose of determining the most suitable methods for the development of oyster culture in this region. These studies have been made in cooperation with J. M. Witsell, chairman of the South Carolina Board of Fisheries. Various experiments and chemical studies dealing with the setting of oysters and the collection of seed were carried out at Folly Island, Beaufort, and Bluffton. At these stations two definite crops of seed oysters were obtained, the first occurring from the 5th to the 20th of June and the second during the last two weeks in September. By the 20th of October the first crop of seed had attained an average length of 1½ inches, while the fall crop measured on the average only one-fourth of an inch in length. The June set was fairly heavy, especially at the State experiment station at Folly River, where the partition collectors gathered from 2,000 to 5,000 seeds per collector. The September set was much lighter in this locality and ranged from 500 to 1,200 seeds per collector.

At the Folly River station the partition collectors and oak poles planted showed that setting occurs in a zone extending from low-water mark to 3 feet above, but is decidedly heaviest in the 1-foot zone above low-water level. Chemical analyses showed that the copper content of the water increased with the ebbing of the tide and was highest (0.35 part of copper per million) when the tide reached low-water mark. Copper stimulates greatly the attachment of the oyster and was found in this locality to have a direct bearing on the abundance of oysters at different tidal levels.

Similar results were obtained in the experiments carried out at Beaufort, S. C., in cooperation with Capt. John L. Wall, of the Maggioni Oyster Co. and at Bluffton in cooperation with the H. O. Lowden Oyster Co. It was found that the planting of shells or artificial spat collectors on the tidal flats can be more efficiently carried out if particular attention is paid to the time of setting and the selection of tidal levels where seed oysters attach in greatest abundance. Since sedimentation is unusually heavy in this region and may in a short time cover seed collectors with a layer of mud, it is obvious that such devices must be planted just prior to the time of setting to be most effective. Experiments with oak poles and brush show that they are very satisfactory under these conditions for

gathering seed oysters if planted vertically, as the surface remains clean and offers the oysters better conditions for feeding and growth than is afforded by old shells. The development of oyster culture by brush and pole methods, similar to those employed in Japan and Australia, appears to be the most practical means for utilizing the extensive mud flats in South Carolina and improving the quality of oysters grown in these waters. Experiments on a small commercial scale will be carried on along this line during the coming year.

*Oyster investigations in Georgia.*—At Turtle River experiments in oyster farming were conducted in cooperation with T. Q. Fleming, of Brunswick, and the Georgia State Board of Game and Fish. Two phases of modern oyster culture were successfully demonstrated through the collection of seed oysters on brush and shells and the transplantation of year-old seed oysters to hard-clay bottoms, where conditions proved favorable for growth and the prevention of overcrowding by heaving setting. During 1931 the spawning and setting of oysters were heaviest in this locality during the period from the middle of May to the middle of June. A very light set of little importance was also obtained the early part of October. Oak poles and brush were planted on the tidal flats and gathered a good crop of seed oysters, thus demonstrating the value of such operations for utilizing the extensive barren mud bottoms in this region. Several hundred bushels of year-old seed from the overcrowded coon oyster reefs were transplanted to deep-water, hard-bottom areas and have shown rapid growth and considerable improvement in shape of the shell over those left on the natural beds. Studies of the temperature, salinity, hydrogen-ion concentration and copper content of the water and their relation to the setting and distribution of oysters in the Turtle River region were made. An examination of many of the natural oyster beds in Georgia showed considerable evidence of depletion from overfishing and the necessity of rehabilitating these beds and adjacent areas by increased planting of shells and brush seed collectors.

## CONTROL OF STARFISH

Starfish investigations carried on by Louise Palmer were conducted with the view of finding an efficient method of combating this dangerous enemy of the oyster.

The common starfish, *Asterias forbesii*, is found along the Atlantic coast from Maine to the Gulf of Mexico, and is the only species common from Cape Cod to New York, an area which is the center of the largest cultivated oyster grounds in the United States.

The problem of starfish control from a practical standpoint resolves itself into the following points:

(1) The present mechanical method of controlling starfish is quite inadequate in decreasing the population to any noticeable degree and is very expensive.

(2) Overhandling and manipulation of oysters results in stunting the growth or even killing individuals.

(3) Great, or perhaps the greatest, damage is done by young, almost microscopic starfish on the spat, for which loss no method of control has been practiced.

Although starfish mops have been used for more than 50 years, there seems to be no diminution in the number of starfish, and they are as serious pests to-day as they were when control was first advocated. A most wasteful result of mechanical control is the injury to the oyster. Aside from the fact that starfish are continuously eating oysters, the mops chains and dredges are continuously breaking off the new shell growth faster than it can be deposited. Such a practice continued over a period of time results in a stunted oyster which requires another year of growth before marketing.

Another phase of the problem is the actual number of shellfish consumed by the starfish. Young starfish 2 or 3 days old can open and digest a 3 or 4 day old spat in a little over 20 minutes. In 11 hours after an adult starfish crawled into a two-year-old oyster it left the shell empty and absolutely clean. On July 21, 1931, 35 starfish, with an arm length between 4 and 7 centimeters were placed in a wooden float in Cold Spring Harbor, and clusters of year-old oysters provided as food. Twelve days later 46 oysters had been eaten and after 30 days 79 were eaten and the average increase in starfish arm length was 0.7 centimeter. Under population conditions as they exist in some seriously infested areas, starfish could completely wipe out an oyster crop if left undisturbed. Because of the inadequacy of the present mechanical methods of combating starfish, attempts were made to control them by chemical means.

The chemistry of sea water is, however, so complicated, its living organisms so varied and important to man, that it is indeed presumptious to propose the using of a poisonous chemical in the water as a means of control. Studies have been made on cases of unusual mortality of organisms or of their destruction due to pollution by industrial wastes, but little or no attempt has been made to artificially change the sea water in order to limit certain forms.

Such a procedure meets with seemingly and perhaps actually insurmountable difficulties. In the first place, any substance which can kill one form is poisonous in a greater or less degree to nearly all other living organisms. Their only hope of escape would be a more effective protective mechanism. Starfish, having an exposed respiratory and circulatory system and a relatively slow locomotion, are less able to protect themselves than oysters, crustacea, or fast-swimming fish.

Many chemicals were tried, but copper sulphate seemed to be the only substance effective in small amounts and at the same time worthy of practical consideration. During the summer of 1931, at the laboratories of the Long Island Biological Association, experiments were performed to determine the effect of that salt on starfish, oysters, and other marine forms.

Experiments with adult starfish show that the time necessary to kill the organisms varies in relation to concentration from 2½ hours (10 parts of $CuSO_4$ per million) to 3 minutes (1,000 parts $CuSO_4$ per million). Starfishes of various age show remarkable difference in susceptibility, the small individuals being affected in a shorter time than the larger ones. For instance, starfish of less than 1 centimeter will be killed by the concentration of 10 parts per million in 5 minutes, but those more than 5 centimeters long remain alive after nearly 2 hours' exposure.

In order to determine the effect of the various environmental factors on the toxicity of copper sulphate, temperature, salinity, and hydrogen-ion concentration were controlled or varied with interesting results. A series of experiments where starfish 3 to 7 centimeters in size were exposed to 500 parts per million of $CuSO_4$, at temperatures ranging from 10° to 35° C., show that exposure necessary to kill decreases from 8 minutes at 10° C. to 1½ minutes at 35° C.

A number of experiments were run testing the effect of pH within the normal range, 7.5 to 8.4. There was a slight tendency for the water with originally lower pH to be more toxic in a given concentration. Individual susceptibility is so varied and the differences so small that the results were quite inconclusive. However, as soon as the pH were artificially lowered below 7 the toxicity became much more pronounced. Whether deaths were due to the copper ion alone could not be determined, for the animals die upon prolonged exposure to water high in hydrogen ions. Copper sulphate lowers the pH of sea water due to its carrying out in the precipitate carbonate and hydroxyl ions. When copper salts are added to acidified sea water no precipitation occurs, and although the toxicity is greatly increased we are dealing with an entirely different phenomena.

The above factors are of considerable importance when practical application of the salt is considered. There is variation in salinity and hydrogen-ion concentration during each tidal cycle. Temperature varies with the seasons, depth of water, river discharge, and solar radiation. A correlation of these factors, together with a lethal concentration of the copper salt and a knowledge of the habits of the starfish, may produce a workable method for control.

*Experiments using copper sulphate on the oyster beds.*—Several methods were attempted in order to see whether it would be practicable to use copper sulphate as a killing agent for starfish on the beds. The first question was concerned with the method of application. The following experiments were tried, and the results are listed under each discussion.

Experiment No. 1 was conducted on the Bluepoints Oyster Co. grounds at Centerport, Long Island, August 4 and 5, 1931. One acre, 6 to 10 feet deep, 300 feet from low-tide line, was chosen for the experiment. A small hand dredge dragged for one minute caught in three hauls an average of 13 starfish 6 to 8 centimeters in size. A concentrated solution of copper sulphate in acidified sea water was prepared by adding 80 pounds of copper sulphate to a barrel holding 7 cubic feet of water. Using a hose, this solution was slowly pumped over the bottom for 20 minutes at slack low tide. The entire acre was covered by circles of the boat. The initial copper content of the water was 0.05 part per million and the pH 7.8. Immediately after the treatment there was 0.6 part per million of copper and a pH of 7.2 at the bottom. The next day there were virtually no starfish on that area, in eight dredges there were three live starfish and no dead ones. Oysters, scallops, and crustacea showed no ill effects. The water, pH, and copper content of the water were normal. Some of the tops of the sea weed and grass were killed, but the roots were unaffected and the grass survived.

Experiment No. 2 was conducted on the Andrew Radel Oyster Co. grounds at Oyster Bay, L. I., August 16 and 17, 1931. The area

chosen was offshore and averaged 16 feet deep. The starfish were small, ranging in size from 3 to 6 centimeters, and were very numerous. The same type of experiment as before was tried, except that a 12-foot 1¼-inch brass pipe was used to form horizontal bar of the T and the T connected by a large hose to the bilge pump of the steam boat. One hundred fifteen gallons of solution containing 100 pounds of copper sulphate and 75 pounds of nitre cake were placed in vats on the deck. The nitre cake is a crude sodium acid sulphate containing a high percentage of sulphuric acid and serves to make the solution more acid, and consequently retards the reaction of the copper with the sea water.

The solution was pumped out at slack low tide on August 17, along a straight line of 500 feet. Twelve minutes pumping emptied the vat. The original pH was 7.8 and the copper content 0.1 part per million. Immediately following the treatment the pH value had dropped to 7.2, but the copper content showed only 0.7 part per million. Next day there were practically no ill effects noticed on the starfish. In three dredges bringing up 33 starfish after a minute's hauling there were only 4 dead ones. The pH and copper content had returned to normal. Better results were obtained in the experiments on grounds of the Beacon Oyster Co., at Wickford, R. I.

A summary of the results of numerous experiments brings out the following points:

(1) Copper sulphate in no case killed more than 10 per cent of the starfish.

(2) Application as a solution is to elaborate in manipulation and no more effective than crystals.

(3) The most effective application consists in scattering crystals of copper sulphate at slack low water, preferably at neap tide.

(4) Starfish reaction to the presence of copper sulphate is one of avoiding the treated area.

(5) The use of paper bags filled with crystals presents a more accurate and economical method of application.

(6) Only in one case were there indications of death of the oysters. Periodic treatment did not seem to affect the food supply to such an extent that the oysters were harmed.

Because of the difficulties encountered in killing adult starfishes by copper-sulphate treatment, it is expected that the solution of the problem can be found in the control of propagation of starfishes rather than in destroying the adults.

## PACIFIC COAST OYSTER STUDIES

At the Hopkins Marine Station, Pacific Grove, Calif., experiments were made by Dr. A. E. Hopkins during three months on the sensitivity of the oyster to salts, most of which normally occur in sea water. The chemical sense of the oyster is highly developed, as shown by the following threshold concentrations: Potassium sulphate, M/640; potassium ferricyanide, M/25,000; potassium nitrate, M/40,000. The potassium salts activate the oyster more effectively than the salts of any of the other normally occurring cations.

*Studies of oyster culture in Puget Sound.*—An intensive investigation was begun during 1931 in cooperation with the State of Wash-

ington on the problems of the Olympia oyster industry. The Washington State Department of Fisheries and Game constructed an adequate field laboratory at Olympia, purchased a boat, and provided a boatman as well as some of the operating expenses. The investigation is being directed by Doctor Hopkins of the bureau, and it is planned to continue the work for several years.

The primary purpose of this investigation is to develop effective methods of collecting seed oysters in order to rehabilitate and expand the industry. Experiments made during the summer gave highly satisfactory results. The daily abundance of spat obtained in the two most important oyster-producing bays was determined throughout the season and at the same time records of temperature, salinity, pH, and plankton were kept. In Oyster Bay setting took place in two distinct periods, centering, respectively, in June and August. In Mud Bay only one important setting period occurred during June and July. A comparative study is being made of hydrographical conditions in these two apparently almost identical neighboring bays in order to throw light on the causes of these differences and on the factors favorable to setting of oyster larvæ.

The hermaphroditic Olympia oyster carries its larvæ for some time in the mantle chamber. Counts of larvæ showed that an individual may bear up to 350,000 at once, the number depending roughly on the size of the parent. Spawning began early in May and some gravid specimens were found as late as the middle of November, though spawning was most general and profuse in May and early June.

Wire baskets of shells suspended from floats in the deep channels well removed from the main oyster beds obtained a set considerably greater than that on the best seed grounds. Few spat were caught in the surface few inches of water; the maximum number were taken at a depth of 10 to 20 inches, below which the abundance gradually diminished to a depth of 8½ feet, the greatest depth tested.

A modification of the egg-crate filler has been developed as a spat collector for use in the dikes in which Olympia oysters are produced. The new type presents a large amount of horizontal surface, absent in the case of the standard filler, and permits circulation of water through the cells. Most spat were caught on the under horizontal surfaces, few on the upper. Because of the free circulation of the water, the vertical surfaces caught more spat than similar surfaces on the standard filler. Although the new type consists of one-fourth less paper, it caught three times as many spat as the standard.

*Investigations in Oregon and California.*—During the past year experiments have been conducted by H. C. McMillin in Oregon and California on native, eastern, and Japanese oysters. There is a widespread interest in oyster culture in these States, but a large majority of the persons now engaged in the industry have had no practical experience. For methods of culture and harvesting they rely almost solely on printed matter, written or verbal suggestions, and demonstrations with seed, or young oysters, on various portions of their lands. Because of this some time has been spent on projects intended to illustrate the rudiments of oyster culture to the growers.

A survey of oyster bottoms in Yaquina Bay revealed that this area contains about 200 acres of natural beds, all of which occur below

the low-tide level. The salinity of the bay is affected by local rainfall and is very low in winter and spring.

Observations on imported Japanese seed oysters planted in Elkhorn Slough, Calif., show that this species grows very rapidly. Seed oysters were received from Japan and planted on March 6; they were ready for the market in eight months.

## ALASKA RAZOR-CLAM INVESTIGATION

Observations on the razor-clam beds in the Prince William Sound, Copper River, and Bering River areas were made during the season of 1931, under the direction of Seton H. Thompson, by the temporary employees detailed to enforce the regulations in regard to the clam fishery.

Sampling to determine the age composition of the commercial catch was continued. The clams taken were from 5 to 12 years old. It has been pointed out in a previous report that 36.5 per cent of the clams mature in their fourth year, 80 per cent in their fifth year, and all are mature at 6 years of age. Approximately 50 per cent of all clams taken in the commercial fishery in 1931 were older than 6 years, and 80 per cent were mature. More than 55 per cent had spawned more than once.

Other observations included a determination of the time and duration of spawning, and the abundance of clams 1, 2, and 3 years old on the bars. The large number of young clams observed on the bars reflects the present healthy condition of the beds.

The razor-clam fishery in this locality in 1931 was more intensive than in any year since 1927, and the pack was considerably larger than any since 1925. The larger pack was partly due to an extension of 15 days to the fishing season, and partly due to the exploitation of new bars as well as to the increase in the number of clam diggers.

It now appears that with the beds in their present satisfactory condition, the regulations which limit the size of razor clams that can be taken for commercial purposes and provide a closed season of six weeks will afford adequate protection for this fishery.

## MUSSEL INVESTIGATIONS AND POLLUTION STUDIES

Investigations of the fresh-water mussel fauna of the interior waters have been continued by Dr. M. M. Ellis, professor of physiology at the University of Missouri, assisted by several investigators. These, together with several professors of the university who collaborate and advise and graduate students who work independently on related problems, constitute the "Columbia (Mo.) unit" of the division in interior waters. Commodious and well equipped laboratory quarters are furnished to the bureau's staff free of charge by the University of Missouri in a new wing of the medical building, acknowledgment of which is hereby gratefully made.

During the spring of 1931 field parties visited the Lake Keokuk district several times to continue observations made during the 1930 survey. Other parties studied streams in northeastern Arkansas, eastern Kansas, and north central Texas. After reoutfitting the U. S. Quarterboat *348* as a floating laboratory at Keokuk, Iowa, a

field party of 11 went aboard in June and continued the survey work begun in 1930. Through the cooperation of the United States Engineer Corps this party covered the Mississippi River from Lake Keokuk south to Cairo, Ill.; the Ohio River from Cairo, Ill., to the mouth of Green River above Evansville, Ind.; and the Tennessee River from its mouth at Paducah, Ky., to the Hiwassee River, some 40 miles above Chattanooga, Tenn. During this survey many tributary streams were examined and an extensive study made of the Lake Wilson (Ala.) region. The boat returned to Keokuk, Iowa, the last of September and the collections were sent to the laboratory at Columbia, Mo., for analyses and review.

After the quarterboat was tied up for the winter, parties working by auto continued field work in the Lake Keokuk region and north on the Mississippi River to Winona, Minn.; also in northern Arkansas and in the Lake Worth region near Fort Worth, Tex. During the last of December field parties working south through Missouri, Arkansas, Tennessee, Mississippi, Louisiana, and Alabama studied the St. Francis, the White, the Black, the Pearl, the Tombigbee, the Warrior, and the Tennessee Rivers and their tributaries.

## POLLUTION STUDIES

In view of the fact that the 1930 survey on the Mississippi River demonstrates that erosion silt is a factor of major importance in many fisheries problems in the inland river systems, particularly problems in which pollution is involved, the pollution studies made by this unit have centered around erosion silt during the past year. In both the field work and the laboratory studies effort has been made to secure qualitative and quantitative data on the effect of erosion silt alone and as a carrier of other substances. The results of the investigations to date may be summarized as follows:

*Mass of silt.*—The amount of silt already deposited on the bottom of the streams studied exceeded even that which the 1930 survey suggested would be found. In certain places the silt deposit exceeded 10 feet, and in one locality on the Tennessee River, 27 feet in thickness. Behind both temporary and permanent obstructions to stream flow the deposition of erosion silt was proceeding rapidly in all of the streams studied, soundings regularly showing deposits from 1 to 4 feet in depth.

*Mechanical action of silt.*—The field work demonstrated that wherever the current of the water is slowed sufficiently not only is the bottom covered with silt deposits but a colloidal suspension of silt particles was to be found just above the top of the semisolid silt, so that in many places there was a progressive gradation from the muddy river water through a thick colloidal suspension to the semisolid mass of deposited silt. Laboratory tests showed that the top layers of the deposited silt and the bottom layers of the suspension supported very little weight, so that even small animals mired down readily in the silt deposit. From the field work it was noted that 6 inches of erosion silt, or frequently less, was sufficient to completely change the bottom fauna and to eliminate most of the sedimentary animals usually found at the bottom of unpolluted streams.

*Erosion silt in suspension.*—A special apparatus making use of photoelectric cells was devised for the measurement of the amount of material in suspension in the various waters studied. By means of this instrument readings could be made both rapidly and very accurately, so that a large amount of data of this sort was assembled during the past year. These studies show that the erosion silt in suspension materially effects the light transmission into the river water, thus materially changing the river as a habitat for certain microorganisms and other animals even before the silt has settled to the bottom. The elimination of light by the silt suspension amounts to over 90 per cent in the first 25 millimeters of water, and silt suspension was found to be selective against certain parts of the spectrum. The greatest penetration through the silt suspension was made by the orange-red rays, although only a small amount of this light was transmitted. The alteration of light penetration by the suspended silt in river water, particularly in the larger bodies of water which are impounded behind the power dams on the Mississippi, produced changes in the plankton, thus altering the basic unit in the food chain of the aquatic fauna. Sudden and abrupt changes in the plankton count followed sudden rises in the amount of suspended matter present in these waters.

The erosion silt in the water also produces definite changes in the heat conduction and heat radiation of the water; and since the dissolved oxygen varies in inverse direction with the temperature, these changes in the heating and cooling of the water attendant on the presence of erosion silt have important bearing on the respiration of the river and therefore on the available oxygen for the animals living therein.

*Erosion silt and oxygen demand.*—Because of the colloidal nature of erosion silt, it carries down with it particles of organic material in various stages of decomposition. Decomposing carcasses of animals and masses of rotting vegetation are also readily covered by the silt deposits and are thus cut off from free access with the water of the stream. Under these conditions the rate and character of the decomposition of the organic material carried down by the silt or buried under it is altered and enormous quantities of gas produced in some places. This condition creates a high oxygen demand in the top layers of the deposited silt, resulting in complete change of the bottom fauna, reducing it to those few forms capable of withstanding conditions of low oxygen and water polluted by products of decomposition. This oxygen demand is not only evident in the quieter portions of the rivers but also shows in the main streams themselves. At the junction of the Ohio and Mississippi Rivers below Birds Point, for example, the oxygen demand of the Mississippi River water loaded with polluted silt from the St. Louis district was sufficient to reduce the entire volume of Ohio River water, which had a much higher oxygen content than the Mississippi, to the Mississippi River level in less than 12 miles.

*Erosion silt and bacteria.*—Comparative bacteriological studies on the erosion silt and organic deposits at the bottom of the river as compared with bacterial counts in the main stream itself show definite differences in the character of the bacterial flora in the silt layers, and in many places an excessively high bacterial count, due

to the combination of erosion silt and organic waste which the erosion silt carries along from the sewerage and wastes introduced into the river by cities and manufacturing plants. Laboratory tests carried forward under controlled conditions show the decomposition of various organic substances mixed with erosion silt to proceed at a slower rate and to produce different end products with greater oxygen demands than the decomposition of these same substances in plain water alone.

*Comparison of silts.*—Chemical studies and electrical and physical measurements on erosion silts from various parts of the Mississippi Valley have been made and technical classifications of these silts obtained, which permit comparisons of the erosion silt action through the Mississippi River system.

*Erosion silt and industrial pollution.*—Detailed laboratory studies on the relation of erosion silt to industrial pollution, particularly sulphur, acid wastes, and heavy metal wastes, are in progress, continuing the work on sulphur, acid pollution, and arsenic begun last year. These studies so far indicate that the erosion of silt is both a carrier and reservoir for many of these substances, and the presence of erosion silt in many cases augments the detrimental action of these substances on living organisms.

## MUSSEL INVESTIGATIONS

The overwhelming of so many mussel beds by the silt deposits is so evident in the Mississippi and Tennessee systems that in view of the proposed modification of many of the inland streams for navigation and hydroelectric plants careful attention has been given to the condition of the existing mussel beds wherever found throughout the field work, and extensive collections of all species, both commercial and noncommercial, were made for survival and population studies. Upward of 10,000 shells have been examined in the last year and detailed statistical studies made of the age, rate of growth, weight, thickness, and of the physiological condition of the animal itself at the time of capture for comparison with the physical and chemical data obtained in the field at the habitat from which the individual mussel was taken. In this way it has been found that the natural replacement at present of fresh-water mussels of the commercial species in the Upper Mississippi River is far below that required for even the maintenance of the existing beds. The statement is also true to a large extent for the portions of the Ohio and Tennessee systems studied. These facts have been set forth in the preliminary report (Fisheries Circular No. 7, 1931). With the depletion of the mussel beds of these major streams almost a certainty if existing conditions continue, detailed physical, chemical, and biological studies have been made in the most favorable habitats found with a view to a duplication of such conditions in controlled waters. From the data obtained experimental raceways have been planned and experiments will be started this spring in the Lake Worth area with a view to duplicating the best conditions for mussel growth and the rearing of large numbers of mussels in small areas.

The transfer of attention from the reestablishment of the mussel beds in the natural habitats in the larger rivers, as the Mississippi

and Tennessee, to the production of artificial beds in controlled habitats has made necessary extensive studies on the physiology of the fresh-water mussel, particularly feeding and general reactions, because of the paucity of literature on these subjects bearing on the particular problems in hand. Consequently, mussels from various parts of the United States have been placed under observation in the laboratories of the unit at Columbia, Mo., and detailed physiological observations made on the movements, respiration, heart action, feeding, hibernation, and growth of these animals. From these studies the oxygen requirements, food choices, food elaboration, and winter habits of these animals have been followed preparatory to placing them under observation in the controlled habitats out of doors. Work reported last year has been confirmed, namely, that contrary to the popular belief most of the mussels prefer clean water and are very sensitive to changes in their environment, particularly such changes as are produced by erosion, silt, sewage pollution, and industrial wastes. It has been found that the animals can be fed readily with several inexpensive substances and the general condition of the mussel improved, as shown by physiological observations on the activity of the animal itself and by the amount of food stored in the living animal. All of these laboratory observations are to be used as scientific backgrounds for the field work at the propagation station.

Observations on glochidia and spawning time of several species of fresh-water mussels have been extended during the past year. The peculiar spawning habits of the Arkansas fanshell have been worked out in considerable detail and constitute a unique type in the known methods of spawning of fresh-water mussels. Gravid yellow sandshells have been carried throughout the winter and observations on the needs of gravid individuals made to extend the knowledge of handling of these animals for breeding stock.

A census of the parasites, diseases, and injuries of the fresh-water mussels have been carried on through the year, as all parasites found have been preserved and the physiological and pathological conditions of each mussel studied noted. As is well known, a water mite is perhaps the commonest parasite of fresh-water mussels in the United States, and the depredations of this parasite have been followed in the field work throughout the year.

*Limnological observations.*—Various species of animals have been used as indicators of river conditions, and consequently collections of plankton, shore animals, and bottom forms have been made wherever possible throughout the course of the field work. These collections are discussed in the forthcoming report on the 1931 survey.

## ACTIVITIES OF THE FISHERIES BIOLOGICAL LABORATORIES

### WOODS HOLE, MASS.

The bureau's laboratory at Woods Hole, under the direction of O. E. Sette, has furthered the scientific investigations of the bureau in supplying facilities for experimental work on oyster problems, fish tagging, rate of development of mackerel eggs, and rearing of larval fish. The station also served as a base for the collection of data on the local mackerel fishery; for studies on planktonic fish eggs and

larvæ; and for the tagging of scup. With the collaboration of the fish-cultural staff, some 4,000 flounders caught incidental to hatchery operations were tagged at the station; also more than 300 brood cod.

Due to the limited funds available for station maintenance, the buildings and equipment have not kept pace with the requirements of the bureau's program. Particularly urgent is the replacement of the collecting vessel and the station launches with more seaworthy craft capable of operating appropriate fishing gear. The station's usefulness would also be greatly increased by weatherproofing the buildings, to permit occupancy for experimental work during the winter and early spring periods, which is the only time that early life-history material on certain important food fishes is available.

In accordance with the bureau's long-established policy of encouraging independent research in marine biology and related subjects, the facilities of the laboratories at Woods Hole, Mass., were made available to a number of investigators from various educational institutions. Personnel so accommodated at Woods Hole included: Dr. Robert P. Bigelow, Massachusetts Institute of Technology, stomatopoda of the *Albatross* Philippine expedition; Frank A. Brown, Harvard University, mechanism of color changes in the shrimp; Dr. N. A. Cobb and assistants, Department of Agriculture, nematodes; Paul S. Conger, United States National Museum, diatoms of the Woods Hole region; Kendall W. Foster, Harvard University, color changes of Fundulus; Dr. F. G. Hall, Duke University, respiration of fishes; Charles W. Hooker, Duke University, respiration of fishes; Mrs. Helen W. Imlah, Radcliffe College, effect of thyroxin on the ascidian larvæ; Dr. George B. Jenkins, George Washington University, vertebrate embryology; Dr. Edwin Linton, University of Pennsylvania, helminth parasites of fishes; W. G. Lynn, Johns Hopkins University, embryology of the nervous system of reptiles; Dr. J. H. Sandground, Harvard University, helminth parasites of fishes; G. W. Taylor, Princeton University, respiration of luminous bacteria and permeability in starfish eggs; Sam R. Tipton, Duke University, respiration of fishes; Dr. C. B. Wilson, State Normal School, Westfield, Mass., copepods of the Carnegie expedition.

## BEAUFORT, N. C.

*Research.*—The Beaufort laboratory under the direction of Dr. S. F. Hildebrand until July 1, 1931, and under Dr. Herbert F. Prytherch after that date, is being developed as a research center in the South Atlantic region for marine studies in both pure and applied biology. The chief investigations conducted here at present by the bureau's staff, as reported elsewhere, deal with the biology and cultivation of the oyster, the copper content of inshore coastal waters, the development and distribution of the shrimp, and the propagation of the diamond-back terrapin. Laboratory facilities have been furnished to independent research workers from other institutions who have engaged in the following studies: Dr. H. V. Wilson and Joseph H. Pratt, jr., of the University of North Carolina, cellular behavior in the embryonic development of hydroids (Pennaria), the early development of sea urchins (Toxopneustes), and the regeneration of young ascidians (Styela); Dr. Bernard

Steinberg, director of the Toledo Hospital, the effect of bacterial toxins on various marine forms; Dr. Ezda Deviney, of the University of North Carolina, regeneration of Ascidians, particularly with respect to the specific cells in Perophora that are of greatest importance in this process; Dr. C. D. Beers, of the University of North Carolina, structure and life history of two colonial protozoa (Vorticellidae); Rebecca Ward, of Judson College, invertebrate marine fauna of this region and early development of several Echinoderms; Dr. Bert Cunningham, of Duke University, relationship of temperature to the rate of embryonic development of diamond-back terrapin.

The facilities of this station were also utilized by the investigators of the United States Chemical Warfare Service, who tested the value of various oils as a preventive of the destruction of wood by marine borers. In cooperation with the Eastman Kodak Co. an educational motion-picture film was prepared showing photomicrographic studies of the development of the oyster and the scientific methods of oyster cultivation that have been developed by the Bureau of Fisheries.

*Terrapin culture.*—The propagation and distribution of the diamond-back terrapin is meeting with greater success each year. In the spring of 1931 about 5,500 year-old terrapins from the 1930 brood were turned over to the North Carolina Department of Conservation and Development for liberation in the coastal waters of this region. The 1931 hatch, amounting to 12,152 young, has exceeded all former records and is over 25 per cent greater than the largest previous hatch of 8,931 in 1928.

Growth studies and feeding experiments with the 1930 brood were made during the first half of the year by Dr. Samuel F. Hildebrand. Several of these experiments extended over three seasons and yielded noteworthy results that are of value in the culture of this species. Of the various foods and mixtures of foods used, oysters fed alone produced the most rapid growth in the 1930 brood, with a mixture of oysters and fish a close second. Fresh fish fed alone promoted a fair rate of growth and is the cheapest and most easily prepared terrapin food available at Beaufort. It was shown again that salt water is a slightly better medium than fresh water for young terrapins in the brooder house.

Various diseases develop during the period that the young are cared for in the rearing house and greatly reduce the total production of year-old individuals. The disease, designated as "sores," for want of a better term, which has been present among young winter-fed terrapins from year to year was rather more prevalent than usual in the 1930 brood and in a few tanks reached epidemic proportions. Among 7,054 animals taken care of in the brooder house, 6 per cent died of this disease. "Soft shell," associated with a failure to feed and to grow, caused 14.2 per cent of deaths, and all other causes 1.6 per cent, making a total death rate of 21.8 per cent. This is near the average death rate for winter-fed animals from 1920 to 1929, inclusive.

In rearing the large 1931 brood particular attention has been given to these diseases and studies made to determine their cause and effective method of control. Shortly after the young were transferred to the rearing house there appeared a serious outbreak of the

tail-and-foot disease, which in the past has destroyed from 17 to 35 per cent of the total brood. Experiments carried out by Dr. H. F. Prytherch for the purpose of finding a practical cure for this malady show that copper is very effective not only in checking the disease but also in permitting regeneration of the infected tissues. In the early fall the disease soon assumed epidemic proportion and appeared in the form of rapid growing lesions of the tail, feet, skin, and eyes of the young terrapins. Various methods of disinfection were tried. The rearing troughs were regularly disinfected with various concentrations of formalin, and a strong solution of salt brine, while the infected terrapins were isolated and treated with dilute solutions of copper sulphate, aluminum sulphate, formalin, and sodium thiosulphate.

In the two control lots there was a loss of over 94 per cent of the terrapins after a period of 10 weeks. On the other hand, those treated with copper sulphate showed in the same length of time a total loss of only 8 per cent. In the aluminum sulphate, formalin, and sodium thiosulphate solutions there were losses of 20 per cent, 15 per cent, and 22 per cent, respectively. Though each of these four solutions checked the rapid growth of the disease, its complete elimination was evident only in the lot of terrapins treated with copper sulphate. A careful examination on November 10 of the terrapins treated with copper showed that every single individual had completely recovered from lesions affecting the eyes, tail, and feet and had grown a new layer of skin over the injured tissues.

Diseased terrapins from the numerous rearing compartments were also placed in a large copper-lined tank in the hope that this might prove a practical method of combating the disease. The animals placed here exhibited remarkable improvement in a few days and showed after a period of three months a loss of only 13 out of a total of 146 infected individuals. Since metallic copper apparently gave off enough free ions to produce a beneficial effect, a small piece of sheet copper 2 inches square was placed in each rearing compartment. Noteworthy results have followed this simple procedure, as evidenced by the fact that the loss of young terrapins has steadily decreased, from 103 in September to 27 in October, 21 in November, and only 8 in December. The records of terrapin mortality for 1930 are much higher than for the present year and show a loss of 41 out of a total of 7,028 in November and 26 out of a total of 6,987 in December, while for the past two months there has been a loss of only 21 out of 12,022 in November and 9 out of 12,001 for December. It is probable that the rapid recovery of the terrapins in the presence of copper is due not only to the bactericidal action of this element but also to a possible deficiency of copper in the diet for blood formation as a result of keeping the animals in confinement.

A report covering all terrapin-cultural activities carried on since the preparation of the last general report in 1927 (Review of Experiments on Artificial Culture of Diamond-Back Terrapin, by Samuel F. Hildebrand, Bulletin, U. S. Bureau of Fisheries, Vol. XLV, 1929 (1930), pp. 25 to 70), was prepared during the year.

*Shore fishes of North Carolina.*—The studies of the development of fish eggs and young fish, undertaken several years ago, was con-

tinued actively by Dr. Samuel F. Hildebrand and Louella E. Cable at the Beaufort Laboratory. Field work was continued, and the collections for study were considerably augmented. In the laboratory the study and identification of specimens was continued, and a special effort was made to build up for different species complete series showing all the stages in the development from the egg, or very small larvæ, to the adult. Descriptions and drawings for several species, together with notes on their spawning habits, rate of growth, food and feeding habits, and commercial importance, were prepared.

## APPROPRIATIONS

Under the terms of the act of May 21, 1930, known as the Five-year construction and maintenance program for the Bureau of Fisheries, additional appropriations of funds for the division of scientific inquiry have been made. During the fiscal year ending June 30, 1931, $262,000 in round numbers was provided for the scientific work of the division. For the remaining half of the year, appropriations for the fiscal year 1932, totaling approximately $322,500, were available. These figures represent the combined appropriations from various accounts except funds spent for vessel operations in connection with scientific work. The funds were allotted in the various sections of the country as follows: For fishery investigations in the Atlantic and Gulf coast areas, 23 per cent; for the Great Lakes and interior lakes, 8 per cent; for the Pacific coast, 17 per cent; for investigations in the interest of fish culture throughout the country, 15 per cent; for shellfish investigations, including oyster cultural studies, mussel propagation, and pollution studies, the shrimp investigations, and the operation of the Beaufort (N. C.) Fisheries Biological Laboratory, devoted chiefly to oyster-cultural studies during the last half of the year, 23 per cent; for studies on the conservation of fish by means of screens and ladders, 6 per cent; for the operation of the central laboratory in Washington, administrative costs, and supplies furnished to field investigations through the Washington office, 7 per cent.

As was pointed out in the previous report of this division, the greatest obstacle to the orderly development of a comprehensive program of fisheries research, adequately covering all sections of the country, lies in the failure to provide for increased vessel operations. Although small craft have been added to the bureau's fleet for inshore-fishery studies, in some localities, in the North Atlantic particularly, investigations are being hampered by lack of adequate vessel facilities. Nevertheless, it is anticipated that, pending the securing of a seagoing vessel suitable for high-seas investigations, some improvement in existing facilities can be made during the fiscal year from funds already appropriated which will in a measure compensate for these deficiencies.

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# PROPAGATION AND DISTRIBUTION OF FOOD FISHES, FISCAL YEAR 1932[1]

By GLEN C. LEACH, *Chief Division of Fish Culture*

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## INTRODUCTION

The artificial propagation of fish in hatcheries and their distribution in public waters by the Federal Government and the States is one phase of the important problem of conservation of aquatic resources. In distributing commercial species of fish governmental hatcheries are helping to provide the raw material for an important food-producing industry, the commercial fisheries. In propagating and planting game fishes the agencies so concerned are acting with a view to conserving recreational facilities, an activity comparable to the maintenance of national and State parks.

In addition to this phase of the conservation of game fish, there are indirect economic factors involved, since the sport of angling has a

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considerable financial bearing, arising from the large expenditures by the public in the pursuit of game fish. This phase was clearly brought out in the report of the Senate Committee on Conservation of Wild Life Resources to the Seventy-first Congress. It is comparatively easy to demonstrate by facts and figures the beneficial results attending the stocking of game fish in any given area, or even of commercial fishes in the minor interior waters. The hatching and distribution of such migrants as the Pacific salmons and other marine varieties does not lend itself so readily to a statistical analysis of the direct benefits. However, in many instances, as in the case of shad, cod, haddock, pollock, and anadromous forms, hatchery activities are in the nature of a by-product recovery, since the eggs not taken and incubated by artificial means would be utterly lost in the marketing of the fish. The commercial forms can be handled in large numbers at a very small unit cost, and justification for the greater part of the hatchery work devoted to the maintenance of the commercial industry lies in the foregoing general facts.

## Part 1.—FISH PRODUCTION: PROPAGATION AND RESCUE WORK

### SPECIES HANDLED

Practically all parts of the United States and certain areas in the Territory of Alaska are covered by the activities of the bureau's hatcheries. Practically every fresh-water form of any importance from a commercial or game standpoint is included among the 49 species which were propagated or handled by rescue crews during the fiscal year 1932. A few selected groups of marine fishes are propagated, but a considerable number of the important species in this category are not readily susceptible to propagation methods or are not in need of such conservation measures at this time and, therefore, are not handled by the hatcheries. There follows a list of the species propagated for the fiscal year 1932.

CATFISHES (SILURIDÆ):
- Catfish (*Leptops olivaris*).
- Spotted catfish (*Ictalurus punctatus*).
- Horned pout (*Ameiurus nebulosus*).

SUCKERS (CATOSTOMIDÆ): Buffalofish (*Ictiobus sp.*) and suckers (*Catostomus commersonii*).

CARP (CYPRINIDÆ): Common carp (*Cyprinus carpio*).

SHAD AND HERRING (CLUPEIDÆ):
- Shad (*Alosa sapidissima*).
- Glut herring (*Pomolobus æstivalis*).

SALMONS, TROUTS, AND WHITEFISHES (SALMONIDÆ):
- Common whitefish (*Coregonus clupeaformis*).
- Cisco (*Leucichthys artedi*).
- Chinook, king, or quinnat salmon (*Oncorhynchus tschawytscha*).
- Chum salmon (*Oncorhynchus keta*).
- Pink or humpback salmon (*Oncorhynchus gorbuscha*)
- Coho salmon, silver salmon (*Oncorhynchus kisutch*).
- Red salmon, sockeye, or blueback salmon (*Oncorhynchus nerka*).
- Steelhead salmon (*Salmo gairdneri*).
- Atlantic salmon (*Salmo salar*).
- Landlocked salmon (*Salmo sebago*).
- Rainbow trout (*Salmo shasta*).
- Golden trout (*Salmo roosevelti*).

SALMONS, TROUTS, AND WHITEFISHES (SALMONIDÆ)—Continued.
Black-spotted trout, redthroat trout (*Salmo lewisi*).
Loch Leven trout (*Salmo levenensis*).
Lake trout, Mackinaw trout (*Cristivomer namaycush*).
Brook trout (*Salvelinus fontinalis*).
Dolly Varden trout (*Salvelinus malma*).
GRAYLINGS (THYMALLIDÆ): Montana grayling (*Thymallus montanus*)
PIKES (ESOCIDÆ): Common pickerel (*Esox reliculatus*).
SUNFISHES (CENTRARCHIDAE):
Crappie (*Pomoxis annularis* and *P. sparoides*).
Largemouth black bass (*Micropterus salmoides*).
Smallmouth black bass (*Micropterus dolomieu*).
Rock bass (*Ambloplites rupestris*).
Warmouth bass, goggle-eye (*Chænobryttus gulosu*
Bluegill sunfish (*Lepomis incisor*).
Green sunfish (*Lepomis cyanellus*).
Redbreasted bream (*Lepomis auritus*).
Red-eared sunfish (*Lepomis heros*).
Common sunfish (*Lepomis gibbosus*).
Rio Grande perch (*Herichthys cyanoguttatus*).
PERCHES (PERCIDAE):
Pike perch (*Stizostedion vitreum*).
Yellow perch, ringed perch (*Perca flavescens*).
WHITE BASSES (SERRANIDÆ):
White bass (*Roccus chrysops*).
Striped bass (*Roccus linealus*).
White perch (*Morone americana*).
DRUMS (SCIÆNIDAE): Fresh-water drum, lake sheepshead (*Aplodinotus grunniens*).
CODS (GADIDÆ):
Cod (*Gadus callarias*).
Haddock (*Melanogrammus æglefinus*).
Pollock (*Pollachius virens*).
FLOUNDERS (PLEURONECTIDÆ): Winter flounder, American flatfish.
MACKEREL (SCOMBRIDÆ): Common mackerel (*Scomber scombrus*).

## OUTPUT

The distribution for the fiscal year 1932 amounted to 7,073,935,200 eggs, fry, and fingerlings from all sources. This output represents a slight regression from that of the previous year, the drop of 47,870,500 being a decline of approximately six-tenths of 1 per cent.

In considering the aggregate output it is essential to analyze the totals with particular reference to the relative status of the various groups, since certain forms of relatively less importance may be handled in extremely large numbers and greatly affect the total, while not exerting any particular bearing upon the true status of the fisheries which are in greatest need of artificial aid. Such analysis is given in subsequent pages, but it is desirable to point out here the relative standing of the main classifications within the above total.

The aggregate output was divided into game fishes, 1.5 per cent; anadromous species (forms which resort to fresh water for spawning), 3.3 per cent; commercial species of interior waters, 17 per cent; marine species, 78 per cent; and approximately 2 per cent consisted of miscellaneous species. The bureau's classification of game fishes includes only those species which are not commercialized and omits several varieties, such as the lake trout and pike perch, which may be quite extensively sought by the angler. On the basis of this classification the game fishes showed a decline of almost 50 per cent, while the anadromous forms were only slightly below the records of the previous year. The marine species were also produced in smaller

numbers than in the previous year, the drop being approximately 5 per cent, while a considerable increase in the output of commercial varieties of interior waters brought the total up to a point negligibly below that for the fiscal year 1931. In the case of the game fishes the size at which they are distributed is probably more significant than the actual number planted. A very sharp drop was in evidence here, the number of fingerlings and adults being 148,619,200, in comparison with over 320,000,000 distributed the previous year. However, the fingerlings actually produced at the hatcheries were approximately the same in number as in the preceding year, the decline in the aggregate being traceable to the marked curtailment in the distribution of rescued fishes from the upper Mississippi River overflowed areas. Practically all the forms handled from that source come in the fingerling category, and a reduction to less than one-third of the previous year's collections was reflected in a drop in the total fingerling output. Of the 49 species distributed 19 showed a decline; the remainder were distributed in moderately increased numbers as compared with the figures of the preceding year.

*Summary, by species, of the output of fish and fish eggs during the fiscal year ended June 30, 1932*

| Species | Eggs | Fry | Fingerlings | Total |
|---|---|---|---|---|
| Catfish | | | 12,185,000 | 12,185,000 |
| Buffalofish | 255,255,000 | | 601,000 | 255,856,000 |
| Common sucker | 17,275,000 | | | 17,275,000 |
| Carp | 227,400,000 | | 20,021,000 | 247,421,000 |
| Shad | | 29,758,000 | | 29,758,000 |
| Glut herring | | 55,000,000 | | 55,000,000 |
| Whitefish | 5,000,000 | 64,880,000 | | 69,880,000 |
| Cisco | | 23,000,000 | | 23,000,000 |
| Chinook salmon | 24,880,000 | 1,450,000 | 45,850,000 | 72,180,000 |
| Chum salmon | 400,000 | 17,878,000 | 314,000 | 18,592,000 |
| Silver salmon | 2,166,000 | 4,074,000 | 1,617,900 | 7,857,900 |
| Sockeye salmon | 3,145,000 | 18,845,000 | 2,769,200 | 24,759,200 |
| Humpback salmon | | 8,862,000 | | 8,862,000 |
| Steelhead salmon | 1,143,000 | | 1,380,000 | 2,523,000 |
| Atlantic salmon | 450,000 | | 693,700 | 1,143,700 |
| Landlocked salmon | 50,000 | 10,000 | 926,700 | 986,700 |
| Rainbow trout | 5,898,000 | | 8,055,000 | 13,953,000 |
| Golden trout | 38,000 | | 12,100 | 50,100 |
| Black-spotted trout | 7,783,000 | 396,000 | 8,999,000 | 17,178,000 |
| Loch Leven trout | 14,822,000 | 3,167,000 | 5,154,000 | 23,143,000 |
| Lake trout | 875,000 | 23,500,000 | 1,255,300 | 25,630,300 |
| Brook trout | 1,213,000 | 1,874,000 | 14,811,000 | 17,898,000 |
| Dolly Varden trout | 2,462,000 | | | 2,462,000 |
| Grayling | | 40,000 | 1,100 | 41,100 |
| Pike and pickerel | | | 59,000 | 59,000 |
| Mackerel | | 15,245,000 | | 15,245,000 |
| Crappie | | | 6,951,000 | 6,951,000 |
| Largemouth black bass | | 1,342,000 | 2,157,000 | 3,499,000 |
| Smallmouth black bass | | 857,000 | 244,800 | 1,101,800 |
| Rock bass | | | 77,200 | 77,200 |
| Warmouth bass | | | 7,000 | 7,000 |
| Sunfish | | | 10,357,200 | 10,357,200 |
| Pike perch | 147,544,000 | 254,060,000 | | 401,604,000 |
| Yellow perch | | 181,892,000 | 384,700 | 182,276,700 |
| Striped bass | | 1,676,000 | | 1,676,000 |
| White perch | | 7,000,000 | 300 | 7,000,300 |
| White bass | | | 16,700 | 16,700 |
| Rio Grande perch | | | 16,300 | 16,300 |
| Fresh-water drum | | | 526,000 | 526,000 |
| Cod | 1,284,558,000 | 344,208,000 | | 1,628,766,000 |
| Haddock | 723,909,000 | 76,242,000 | | 800,151,000 |
| Pollock | | 14,670,000 | | 14,670,000 |
| Winter flounder | 81,965,000 | 2,967,159,000 | | 3,049,124,000 |
| Miscellaneous fishes | | | 3,176,000 | 3,176,000 |
| Total | 2,808,231,000 | 4,117,085,000 | 148,619,200 | 7,073,935,200 |

NOTE.—All carp shown in above table are planted in commercial fishing areas from which the eggs are secured.

## COOPERATION WITH OTHER CONSERVATION AGENCIES

The attitude of the large sportsmen's organizations, individual sportsmen, and commercial fishing interests leaves no room for the conclusion that there is an excess distribution of hatchery fish or a surplus of facilities for their production. In view of this situation the operation of both Federal and State hatcheries within any given area can not fairly be considered a duplication of effort, since too frequently their combined output is not adequate to meet the purpose for which intended—namely, the maintenance of an abundant stock of food and game fishes. In the practical execution of these enterprises cooperative programs may be developed which will insure more effective work by the agencies concerned and prevent overlapping or duplication of effort in some particular area without affecting the essential truth that a vast field is not being thoroughly and adequately covered. This cooperation is largely in the nature of technical management and more effective routine administration. During the past year the bureau maintained effective and mutually beneficial affiliations with some 22 States. In the majority of cases the States were the principal beneficiaries, which is in line with the original concept of the bureau's activities to aid and promote State conservation work. The following citations constitute only a mention of some of the outstanding examples of the cooperative arrangements in effect, since it is not feasible to include a full summary of details of a more or less routine nature.

As heretofore, the Montana fisheries authorities assisted the bureau in the operation of the Miles City (Mont.) bass hatchery and interchanges of eggs between that State and the bureau were made which resulted in an appreciable saving to both agencies. In the work of propagating pike perch at its Lake Champlain hatchery the bureau received assistance from Pennsylvania and Vermont, and the first mentioned State assumed part of the work of distributing young trout to the cooperative sportsmen's nurseries operating within its boundaries. The most cordial relations were maintained with the State of Michigan in the collection of eggs of the commercial fishes of the Great Lakes, and similar arrangements prevailed in connection with the operation of the Federal and State salmon hatcheries in the States of Washington and Oregon. The bureau continued to hatch trout in considerable numbers at its West Virginia hatchery for account of that State. The bureau's only existing striped bass hatchery was operated jointly with the State of North Carolina, and the North Carolina authorities rendered material assistance in distributing game fish from the bureau's Albemarle Sound station. Virginia, Maryland, and a number of States in the Middle West have entered into joint distribution arrangements with the bureau which have resulted in considerable saving. In the Rocky Mountain area, where the collection of wild trout eggs is one of the most important features of fish-cultural endeavor, the bureau received State assistance, making it possible by virtue of the arrangements entered into to allocate eggs to these States in considerable numbers. During part of the year one of the bureau's employees was detailed to initiate trout-cultural work in South Carolina, and a similar plan was followed in Arkansas in connection with the development of the large bass hatchery operated by that State. During the latter part of the fiscal year plans were formulated by the bureau and the New York fisheries

authorities for the cooperative management of a substation at Cortland, N. Y., to be devoted to fish-cultural research, and for the conduct of pond-cultural experiments near the city of Rochester, with the view of demonstrating the possibilities of local or community fish-cultural operations. A statement of further details along this line appears unnecessary, but the bureau feels that the sentiment in practically all of the States is such that when occasion arises cooperative relations of mutual benefit may be developed.

The bureau has been privileged to assist in the work of several of the larger public aquaria in the country and has received courtesies in kind.

The activities of the division of fish culture have contact to a limited extent with other Federal agencies, notably the Forest Service, the National Park Service, the Indian Service, and the Bureau of Reclamation. The Bureau of Fisheries has assumed responsibility for the greater part of all fisheries work involved in the maintenance of wild life in the national parks. Two hatcheries are now maintained exclusively for that purpose and a third, in the Mount Rainier National Park, is nearing completion. The vast national forest areas are to a great extent desirable game fish waters, and obviously it is a function of the bureau to maintain the fish population in this part of the public domain. While fish from the bureau's hatcheries have been allocated for stocking national forest waters for many years, such plantings have been of a more or less haphazard character, lacking the basis of a clear understanding of what was required and feasible. In addition to surveys of national park waters during the year, the bureau sent out several field parties to study selected national forest areas and formulate a stocking policy which may be adhered to in future distributions. Thus far such activity has been confined to the Rocky Mountain States, being centered in Utah, Idaho, and Colorado. It is the present policy to continue this work indefinitely, constantly extending it into new areas, until the vast domain of the national forests has been adequately charted in so far as fish life and the requirements for fish stocking are concerned.

The bureau again received assistance from the Indian Service in connection with the collection of black-spotted trout eggs at Pyramid Lake, Nev. In the course of the year efforts were initiated to attain closer contact with the Bureau of Reclamation, Department of the Interior, since the activities of that agency in constructing irrigation projects, particularly in the Northwest, have a strong bearing on the welfare of important fisheries. In most cases these fisheries may be preserved or subjected to a minimum damage by giving attention to the installation of adequate fish ladders in the dams or by the proper screening of diversions. The main thought for consideration in connection with both State and Federal agencies working in allied fields is to assure that the various projects shall be actually carried on by the agency best qualified to accomplish effectively the object sought, at the lowest practicable cost.

## COOPERATIVE FISH NURSERIES

It is evident that the economic stress has affected the ability of sportsmen's organizations to carry on independent projects to supplement the work of the Federal hatcheries. One of the most promising developments of this nature was the cooperative nursery system

whereby fish which were being distributed from hatcheries, due to lack of facilities for rearing, were taken over by the sportsmen, cared for, and fed in suitable nursery ponds or pools. Some expense to the sportsmen was involved in the construction of the pools and the cost of fish food and necessary attention. The bureau distributed practically the same number of fish to fewer nurseries during the fiscal year 1932, which indicates that the burdens of expense, slight though they may be, were beyond the resources of some organizations. However, this weeding out process has not been without benefit, since the nurseries which have remained in operation are the better supported units, with superior facilities, and offer more favorable prospects for the production of larger numbers of large sized fish. A number of the States have taken over such work, providing fish from their own hatcheries and in some cases making a grant or subsidy to defray part of the cost formerly borne by the sportsmen. Practical considerations will make it impossible for the bureau to adopt the latter plan, and it is highly desirable that there be a gradual transfer of these cooperative nurseries to State auspices, whereby closer supervision may be maintained and more satisfactory results achieved.

Among the larger projects which have continued affiliations with the bureau are those at Barneveld, N. Y.; Ogletown, Pa.; Watertown, N. Y.; Turtle Lake, Mich.; and Clare County, Mich. The latter is of particular interest, in that it represents an effort on the part of a community which derives direct financial benefit from its game fishing waters to assure the perpetuation and maintenance of this asset. In summary, the number of nurseries to which the bureau furnished fish, or which received fish from other sources at the instance of the bureau, declined from 119 in the fiscal year 1931 to 116 in the fiscal year 1932. There follows a tabulation of their location, with a summary of the fish supplied.

*Cooperative nurseries and rearing ponds supervised by the bureau in 1932*

| Locality | Number of fish supplied | Kind |
|---|---|---|
| Maryland: | | |
| Catoctin | 50,000 | Rainbow trout. |
| Do | 87,500 | Brook trout. |
| Williamsport | 50,000 | Black bass. |
| Massachusetts: | | |
| Adams | 30,000 | Brook trout. |
| Chester | 5,800 | Do. |
| Florence | 2,600 | Do. |
| Great Barrington | 10,000 | Do. |
| Holyoke | 25,000 | Do. |
| Lowell | 12,000 | Do. |
| Ludlow | 4,000 | Do. |
| Pittsfield | 20,000 | Do. |
| Springfield | 33,150 | Do. |
| Michigan: | | |
| Harrison | 200,000 | Do. |
| Highland | 5,000 | Do. |
| Do | 5,000 | Loch Leven trout. |
| Do | 5,000 | Rainbow trout. |
| Hillman | 325,000 | Brook trout. |
| Rose City | 150,000 | Do. |
| Do | 30,000 | Loch Leven trout. |
| Spruce | 50,000 | Brook trout. |
| Minnesota: | | |
| Anoka | 5,000 | Do. |
| Lake City | 3,000 | Do. |
| Minnesota—Contd. | | |
| Mora | 5,000 | Brook trout. |
| Northfield | 5,250 | Rainbow trout. |
| Red Wing | 16,000 | Brook trout. |
| Rochester | 6,000 | Do. |
| Rushford | 25,000 | Rainbow trout. |
| St. Charles | 2,000 | Brook trout. |
| Winona | 20,000 | Loch Leven trout. |
| Do | 28,000 | Brook trout. |
| Do | 20,000 | Rainbow trout. |
| New Hampshire: | | |
| Concord | 8,000 | Brook trout. |
| Manchester | 12,000 | Do. |
| Merrimack | 10,000 | Do. |
| Milford | 15,000 | Do. |
| Peterboro | 25,000 | Do. |
| Portsmouth | 8,000 | Do. |
| New York: | | |
| Adams | 5,075 | Do. |
| Arena | 25,000 | Loch Leven trout. |
| Barneveld | 450,000 | Brook trout eggs. |
| Do | 119,000 | Rainbow trout eggs. |
| Forestport | 23,000 | Brook trout. |
| Malone | 69,500 | Do. |
| Oneonta | 57,500 | Do. |
| Watertown | 100,000 | Do. |

*Cooperative nurseries and rearing ponds supervised by the bureau in 1932*—Continued

| Locality | Number of fish supplied | Kind |
|---|---|---|
| Pennsylvania: | | |
| Altoona | 80,000 | Brook trout |
| Berwick | 40,000 | Do. |
| Do | 15,000 | Rainbow trout. |
| Do | 15,000 | Loch Leven trout. |
| Bloomsburg | 20,000 | Brook trout. |
| Do | 10,000 | Loch Leven trout. |
| Fairmount Springs | 35,000 | Brook trout. |
| Galeton | 40,000 | Do. |
| Hazleton | 15,000 | Do. |
| Do | 15,000 | Rainbow trout. |
| Indiana | 10,000 | Brook trout. |
| Johnsonburg | 10,000 | Do. |
| Johnstown | 10,000 | Do. |
| Do | 10,200 | Rainbow trout. |
| Ligonier | 15,000 | Brook trout. |
| Do | 15,000 | Rainbow trout. |
| Do | 10,400 | Loch Leven trout. |
| Marlenville | 10,000 | Brook trout. |
| Muncy | 35,000 | Do. |
| Do | 30,000 | Loch Leven trout. |
| Meyersdale | 30,000 | Brook trout. |
| Ogletown | 200,000 | Brook trout eggs. |
| Pittston | 20,000 | Brook trout. |
| Do | 5,000 | Loch Leven trout. |
| Punxsutawney | 10,000 | Brook trout. |
| Scranton | 40,000 | Rainbow trout. |
| Do | 20,000 | Loch Leven trout. |
| Shamokin | 15,200 | Do. |
| Stroudsburg | 15,000 | Brook trout. |
| Troy | 15,000 | Do. |
| White Haven | 25,000 | Do. |
| Williamsport | 100,000 | Do. |
| Do | 15,200 | Loch Leven trout. |
| Vermont: | | |
| Averill | 101,000 | Brook trout. |
| Do | 30,000 | Lake trout. |
| Do | 39,000 | Landlocked salmon. |
| Bennington | 62,700 | Brook trout. |
| Weston | 40,000 | Do. |
| Virginia: | | |
| Shawsville | 10,500 | Do. |
| Warm Springs | 5,700 | Do. |
| Do | 8,000 | Rainbow trout. |
| Woodbridge | 14,880 | Black bass. |
| West Virginia: | | |
| Durbin | 40,000 | Brook trout. |
| Do | 10,000 | Rainbow trout. |
| Wisconsin: | | |
| Arcadia | 15,000 | Brook trout. |
| Bay City | 5,000 | Do. |
| Boscobel | 19,500 | Do. |
| Do | 5,250 | Rainbow trout. |
| Boyd | 8,000 | Brook trout. |
| Darlington | 5,950 | Rainbow trout. |
| Eau Claire | 13,000 | Brook trout. |
| Do | 40,000 | Rainbow trout. |
| Ellsworth | 30,000 | Do. |
| Do | 10,000 | Brook trout. |
| Elmwood | 5,000 | Do. |
| El Paso | 10,000 | Do. |
| Elroy | 20,800 | Do. |
| Galesville | 20,000 | Do. |
| Hatley | 20,000 | Do. |
| Hazel Green | 12,000 | Do. |
| Holmen | 8,000 | Do. |
| Independence | 20,000 | Do. |
| La Crosse | 17,600 | Do. |
| Do | 20,000 | Loch Leven trout. |
| Laona | 30,000 | Brook trout. |
| Madison | 5,200 | Do. |
| Do | 5,000 | Loch Leven trout. |
| Manitowoc | 11,400 | Rainbow trout. |
| Marathon | 20,000 | Brook trout. |
| Medford | 5,000 | Do. |
| Monroe | 15,000 | Do. |
| Do | 4,000 | Loch Leven trout. |
| Merrill | 20,000 | Brook trout. |
| Mountain | 20,000 | Do. |
| Nekoosa | 20,000 | Do. |
| Osseo | 10,000 | Do. |
| Park Falls | 15,000 | Do. |
| Plum City | 3,000 | Do. |
| Do | 7,000 | Rainbow trout. |
| Prescott | 30,000 | Brook trout. |
| Rothschild | 13,000 | Do. |
| Shullsburg | 10,000 | Loch Leven trout. |
| Stanley | 20,000 | Brook trout. |
| Stevens Point | 10,000 | Do. |
| Do | 19,850 | Rainbow trout. |
| Tunnel City | 10,000 | Brook trout. |
| Viola | 8,000 | Do. |
| Viroqua | 21,000 | Loch Leven trout. |
| Westby | 12,000 | Do. |
| Whitehall | 2,000 | Brook trout. |
| Total | 4,126,705 | |

## STATE FISH-CULTURAL ACTIVITIES

*Data on State fish-cultural activities and licenses*

| State | Number of fishing licenses issued | Fees received from licenses | Number of hatcheries | Number of fish-cultural employees | Expenditures for propagation of fish |
|---|---|---|---|---|---|
| Alabama | 476 | $2,380.00 | 1 | 2 | |
| Arizona | 25,000 | 62,000.00 | 4 | 7 | $15,143.20 |
| Arkansas | 18,589 | 39,641.60 | 2 | 1 | 25,500.00 |
| California | 242,394 | 496,390.00 | 28 | 130 | 296,773.66 |
| Colorado | 106,466 | 196,199.00 | 15 | 26 | 95,000.00 |
| Connecticut | 37,188 | 132,649.30 | 4 | 13 | 68,615.76 |
| Delaware | 1,997 | 4,723.47 | | | 78.46 |
| Florida [1] | 20,415 | 58,527.00 | | | 20,312.89 |
| Georgia | | | 1 | 2 | 2,040.00 |
| Idaho | 74,731 | 155,469.40 | 11 | 16 | 76,198.47 |
| Illinois | 425,000 | 175,000.00 | 7 | 7 | 70,000.00 |
| Indiana | 312,814 | 295,344.80 | 5 | 15 | |
| Iowa | 241,677 | 241,677.00 | 4 | 7 | 36,533.58 |
| Kansas | 85,329 | 85,329.00 | | 5 | |

[1] Amounts given are for fiscal year 1931.

*Data on State fish-cultural activities and licenses*—Continued

| State | Number of fishing licenses issued | Fees received from licenses | Number of hatcheries | Number of fish-cultural employees | Expenditures for propagation of fish |
|---|---|---|---|---|---|
| Kentucky | 55,377 | $49,691.30 | 4 | 3 | $24,487.57 |
| Louisiana | 12,000 | 12,700.00 | 4 | 10 | 12,331.89 |
| Maine | 85,665 | 119,689.00 | 31 | 45 | 199,307.52 |
| Maryland | 12,954 | 16,543.54 | 6 | 8 | 15,040.99 |
| Massachusetts | 114,555 | 320,289.10 | 7 | 9 | 49,165.25 |
| Michigan | 121,286 | 200,716.00 | 15 | 85 | 289,844.11 |
| Minnesota | 439,758 | 373,419.45 | 13 | 31 | 131,394.40 |
| Missouri | 259,637 | 310,410.81 | 7 | 4 | 43,286.39 |
| Montana | 70,422 | 146,388.00 | 14 | 20 | 79,854.97 |
| Nebraska | 175,000 | 175,000.00 | 20 | 21 | 100,000.00 |
| Nevada | 7,018 | 11,044.00 | 1 | 4 | |
| New Hampshire | 72,620 | 154,723.10 | 6 | 30 | 127,967.08 |
| New Jersey | 193,423 | 279,053.10 | 2 | 15 | 82,307.30 |
| New Mexico | 20,468 | 54,431.25 | 5 | 12 | 55,000.00 |
| New York | 505,561 | 1,047,063.34 | 10 | 135 | 285,000.00 |
| North Carolina | 18,986 | 33,237.25 | 5 | 4 | 26,389.81 |
| North Dakota | 22,616 | 9,826.90 | 3 | 6 | 5,494.98 |
| Ohio | 98,478 | 100,674.85 | 13 | 52 | 125,164.37 |
| Oklahoma | 50,023 | 60,212.75 | 5 | 10 | |
| Oregon | 80,617 | 285,521.23 | 37 | 150 | 220,073.04 |
| Pennsylvania | 255,062 | 395,760.00 | 8 | 31 | 278,174.22 |
| Rhode Island | 11,849 | 13,765.65 | 1 | 6 | 22,400.00 |
| South Carolina | 166 | 1,660.00 | 1 | 2 | 5,000.00 |
| South Dakota | 48,044 | 53,490.00 | 6 | 10 | 31,568.96 |
| Tennessee | | | | | |
| Texas | 36,500 | 36,500.00 | 9 | 20 | 45,000.00 |
| Utah | 44,784 | 94,840.60 | 8 | 18 | 48,000.00 |
| Vermont | 63,765 | 90,803.20 | 5 | 15 | 65,603.60 |
| Virginia [2] | 35,096 | 125,663.50 | 1 | 4 | 26,868.98 |
| Washington [3] | 23,764 | 143,283.00 | 28 | 107 | 132,887.70 |
| West Virginia | 150,400 | 194,000.00 | 3 | 3 | 19,000.00 |
| Wisconsin | 59,953 | 161,603.10 | 20 | 43 | 132,918.96 |
| Wyoming | 39,899 | 117,000.00 | 8 | 12 | 56,591.07 |
| Total | 4,777,822 | 7,134,334.59 | 388 | 1,156 | 3,442,325.18 |

[2] In addition to above 95,178 county licenses were issued in Virginia, valued at $95,178.
[3] 13 county hatcheries not accounted for above were operated in the State of Washington, and 195,719 county fishing licenses, valued at $296,791.50, were issued.

*Output of fish by State hatcheries*

| State | Trout | Bass | Other game fish | Commercial species | Total |
|---|---|---|---|---|---|
| Alabama | | 146,204 | 415,125 | | 561,329 |
| Arizona | 1,270,408 | | | | 1,270,408 |
| Arkansas | | 437,295 | 284,075 | 507,450 | 1,228,820 |
| California | 33,145,279 | | 2,350 | 4,375,940 | 37,523,569 |
| Colorado | 26,083,146 | | 725,500 | | 26,808,646 |
| Connecticut | 415,634 | 37,852 | 65,359,744 | 111,488,439 | 177,301,669 |
| Delaware | | 576 | 5,006 | | 5,582 |
| Florida | | 701,900 | | | 701,900 |
| Georgia | 205,000 | 10,000 | 30,000 | | 245,000 |
| Idaho | 9,405,747 | | | | 9,405,747 |
| Indiana | | 934,087 | 13,325,450 | | 14,259,537 |
| Iowa | 14,108 | 547,925 | 99,087,222 | | 99,649,255 |
| Kansas | | 60,200 | 622,400 | | 682,600 |
| Kentucky | | 264,530 | 128,855 | | 393,385 |
| Louisiana | | 130,000 | 200,000 | | 330,000 |
| Maine | 6,549,401 | | 3,807,268 | | 10,356,669 |
| Maryland | 10,463 | 27,846 | 672,576 | 370,380,400 | 371,091,285 |
| Massachusetts | 610,951 | 227,152 | 626,010 | | 1,464,113 |
| Michigan | 11,093,000 | 494,900 | 43,378,900 | 131,102,000 | 186,068,800 |
| Minnesota | 8,336,585 | 90,240 | 2,172,804 | 780,115,632 | 790,715,261 |
| Missouri | 450,156 | 384,661 | 983,311 | 131,996 | 1,950,124 |
| Montana | 25,505,273 | 224,543 | 2,492,989 | | 28,222,805 |
| Nebraska | 480,950 | 1,016,479 | 1,866,220 | | 3,363,649 |
| Nevada | 809,040 | | [1] 126,560 | | 935,600 |
| New Hampshire | 4,428,033 | 105,970 | 242,520 | | 4,776,523 |
| New Jersey | 571,817 | 127,900 | 116,264,655 | 805,000 | 117,769,372 |

[1] Of these 126,480 were silverside salmon.

*Output of fish by State hatcheries*—Continued

| State | Trout | Bass | Other game fish | Commercial species | Total |
|---|---|---|---|---|---|
| New Mexico | 1,992,215 | 12,000 | 11,882 | | 2,016,097 |
| New York | 9,907,555 | 633,342 | 9,499,337 | 619,742,671 | 639,782,905 |
| North Carolina | 3,700,200 | 346,380 | 2,458,569 | | 6,505,149 |
| North Dakota | | 15,795 | 3,499,120 | | 3,514,915 |
| Ohio | | 184,206 | 2,666,406 | 161,260,000 | 164,110,612 |
| Oklahoma | | 1,079,800 | 464,975 | | 1,544,775 |
| Oregon | 22,451,400 | 29,800 | 983,200 | 85,226,510 | 108,690,910 |
| Pennsylvania | 1,000,604 | 387,474 | 1,702,582 | 514,980,797 | 518,071,457 |
| Rhode Island | 82,097 | 15,167 | 15,531 | | 112,795 |
| South Carolina | 500,000 | | | | 500,000 |
| South Dakota | 294,385 | 13,882 | 4,268,249 | | 4,576,516 |
| Texas | | 328,000 | 1,658,047 | | 1,986,047 |
| Utah | 7,500,000 | | | | 7,500,000 |
| Vermont | 316,095 | 32,760 | 748 | 61,660,000 | 62,009,603 |
| Virginia | 149,940 | 45,386 | | 40,355,225 | 40,550,551 |
| Washington | 47,893,261 | 235,000 | | 173,190,173 | 221,318,434 |
| West Virginia | 366,750 | 223,670 | 17,000 | | 607,420 |
| Wisconsin | 7,092,091 | 695,119 | 1,995,649 | 367,963,636 | 377,746,495 |
| Wyoming | 14,140,000 | | | | 14,140,000 |
| Total | 246,771,584 | 10,248,041 | 382,060,835 | 3,423,285,869 | 4,062,366,329 |

In presenting the foregoing tables the bureau wishes to emphasize that they do not form a complete statistical summary. They are submitted with a full knowledge that they are merely indicative of the general trend of fisheries conservation work on the part of the States. The data were compiled from information supplied by the State authorities, and in a number of instances all of the statistics requested were not furnished. In at least one instance no information whatever was forthcoming. These facts account for the existing voids and prevent the tables from presenting a completely accurate picture of the magnitude of State fish-cultural activities and expenditures. Furthermore, due to the fact that some of the States employ a fiscal year corresponding with the calendar year, while in others the end of June indicates the close of the business year, the periods covered by the data shown are not on the same basis in every case. The tables are submitted, therefore, merely as an approximation of an average year's endeavor in fish culture and allied fields on the part of the States. In every case the information covers the latest complete year for which statistics are available.

In comparison with data collected in an almost identical manner last year, it is noticeable that there was a reduction of over 800,000 in the number of fishing licenses issued and that receipts from the sale of licenses declined to the extent of slightly over $400,000. The character of the fishing licenses listed in the tables should be explained. The term "fishing licenses" as used comprises all licenses carrying the privilege of fishing. It, therefore, includes a very large number of the so-called combination licenses generally sold to residents which carry the privilege of fishing, hunting, and even trapping in a single permit. Obviously not all licensees of this class purchase a license for the purpose of fishing, but the figures are included as an indication of the number of potential anglers. The tables show an increase of 4 over last year in the number of State fish hatcheries and a decline of 73 in the number of employees. Expenditures for fish-cultural work receded somewhat, being some $200,000 below those of the previous year. The total output of fish of all species

is virtually the same as in the previous report, a decline of over a million in the output of bass being balanced by a corresponding increase in the distribution of trout and other game fish. The distribution of commercial species by the States was only slightly changed from the output of the previous year.

The curtailment of income of the State fish and game departments, resulting chiefly from a drop in number of licenses issued, is reflected in smaller expenditures for propagation. This handicap was largely overcome, however, by increased efficiency in conducting the work, and through such means the output of fish closely approximated the figures of preceding years.

Again the bureau wishes to stress a point emphasized in previous issues of its reports, namely, that a numerical comparison of output between the various States is misleading and unfair in the absence of definite knowledge as to the size of the fish distributed. It is obvious that a State distributing game fish of legal size, as a considerable number of them do, can not hope to compete in numbers with a State which plants newly hatched fish or small fingerlings. The fact that a State distributes twice or three times as many trout or bass as another should not constitute a basis for invidious comparison without taking into account the details of their respective distribution practices.

## SALVAGE OPERATIONS

The comparatively normal water conditions in the upper Mississippi River area, including the Upper Mississippi Wild Life Fish and Game Refuge territory, rendered extensive rescue or salvage operations unnecessary. The total collection of 51,611,367 stranded fish represents a marked reduction from the all-time record of the previous year, being only about one-third of the number handled in 1931. The rescued fishes were mainly returned, as usual, to the main channel of the Mississippi River, as is shown by the following tabulation:

*Number and disposition of fish rescued, fiscal year 1932*

| Locality and species | Delivered to applicants | Restored to original waters | Total number of fish rescued |
|---|---|---|---|
| All stations: | | | |
| Buffalofish | | 600, 830 | 600, 830 |
| Carp | | 20, 020, 600 | 20, 020, 600 |
| Catfish | 15, 730 | 12, 043, 900 | 12, 059, 630 |
| Crappie | 22, 335 | 6, 723, 105 | 6, 745, 440 |
| Fresh-water drum | | 525, 375 | 525, 375 |
| Largemouth black bass | 79, 980 | 178, 087 | 258, 067 |
| Pike and pickerel | | 58, 485 | 58, 485 |
| Sunfish | 66, 760 | 7, 826, 015 | 7, 892, 775 |
| White bass | | 16, 665 | 16, 665 |
| Yellow perch | 6, 655 | 266, 275 | 272, 930 |
| Miscellaneous | | 3, 160, 570 | 3, 160, 570 |
| Total | 191, 460 | 51, 419, 907 | 51, 611, 367 |
| Summary by stations: | | | |
| Bellevue, Iowa | 2, 000 | 9, 776, 885 | 9, 778, 885 |
| Homer, Minn | 98, 960 | 17, 912, 590 | 18, 011, 550 |
| La Crosse, Wis | 71, 490 | 6, 782, 080 | 6, 853, 570 |
| Lynxville, Wis | 9, 085 | 7, 159, 695 | 7, 168, 780 |
| Marquette, Iowa | 9, 925 | 9, 788, 657 | 9, 798, 582 |
| Total | 191, 460 | 51, 419, 907 | 51, 611, 367 |

## TRANSFERS OF EGGS BETWEEN STATIONS

The following table, showing transfers of eggs between the various stations of the bureau, illustrates the interdependence of a nation-wide system of hatcheries. Were it not possible to effect these transfers between the different units of the bureau's hatchery system, the receiving stations could secure their supplies only at a greatly increased cost, and at several stations no supplies whatever of certain species would be obtainable. A definite program is now under way for the development of certain stations, particularly the one at York Pond, N. H., and several of the stations in the Rocky Mountain area, as a source of supply for trout eggs for the remainder of the hatcheries handling these forms.

*Transfer of eggs between stations, fiscal year 1932*

| Species | Number of eggs | From— | To— |
|---|---|---|---|
| Atlantic salmon | 50,000 | Craig Brook, Me | Grand Lake Stream, Me. |
| Black-spotted trout | 225,000 | Creede, Colo | Leadville, Colo. |
| | 18,000 | Pittsford, Vt | Cape Vincent, N. Y. |
| | 27,000 | do | Leetown, W. Va. |
| | 271,000 | Springville, Utah | Bozeman, Mont. |
| | 77,000 | do | Creede, Colo. |
| | 97,000 | do | Leadville, Colo. |
| | 25,000 | Yellowstone Park, Wyo | Birdsview, Wash. |
| | 125,000 | do | Quilcene, Wash. |
| | 200,000 | do | Salmon, Idaho. |
| | 100,000 | do | Leadville, Colo. |
| | 25,000 | do | Quinault, Wash. |
| | 1,000,000 | do | Puget Sound stations. |
| Brook trout | 246,000 | Madison Valley, Mont | Bozeman, Mont. |
| | 250,000 | Craig Brook, Me | Cape Vincent, N. Y. |
| | 100,000 | do | Barneveld, N. Y. |
| | 150,000 | do | Cortland, N. Y. |
| | 600,000 | do | Erwin, Tenn. |
| | 250,000 | do | Manchester, Iowa. |
| | 1,000,000 | do | White Sulphur Springs, W. Va. |
| | 100,000 | do | Wytheville, Va. |
| | 350,000 | Leadville, Colo | Cape Vincent, N. Y. |
| | 75,000 | do | La Crosse, Wis. |
| | 250,000 | do | Manchester, Iowa. |
| | 5,000 | do | Springville, Utah. |
| | 100,000 | do | White Sulphur Springs, W. Va. |
| | 100,000 | Creede, Colo | Bozeman, Mont. |
| | 225,000 | do | Springville, Utah. |
| | 262,000 | Pittsford, Vt | Leetown, W. Va. |
| | 300,000 | Springville, Utah | Bozeman, Mont. |
| | 250,000 | do | Manchester, Iowa. |
| | 250,000 | do | Saratoga, Wyo. |
| Chinook salmon | 25,000 | Little White Salmon, Wash | Clackamas, Oreg. |
| | 2,000,000 | do | Salmon, Idaho. |
| | 2,650,000 | do | Puget Sound stations. |
| Chum salmon | 25,000 | do | Clackamas, Oreg. |
| | 2,600,000 | Quilcene, Wash | Duckabush, Wash. |
| Cisco | 400,000 | Cape Vincent, N. Y | Nashua, N. H. |
| Dolly Varden trout | 2,462,000 | Afognak, Alaska | Puget Sound stations. |
| Grayling | 6,000 | Pittsford, Vt | Leetown, W. Va. |
| Lake trout | 7,000 | Cape Vincent, N. Y | Nashua, N. H. |
| Landlocked salmon | 50,000 | Craig Brook, Me | Grand Lake Stream, Me. |
| | 25,000 | do | Nashua, N. H. |
| | 25,000 | do | St. Johnsbury, Vt. |
| | 400,000 | Grand Lake Stream, Me | Craig Brook, Me. |
| Loch Leven trout | 100,000 | Bozeman, Mont | Cape Vincent, N. Y. |
| | 100,000 | do | Erwin, Tenn. |
| | 400,000 | do | La Crosse, Wis. |
| | 200,000 | do | Leadville, Colo. |
| | 250,000 | do | Creede, Colo. |
| | 50,000 | do | Leetown, W. Va. |
| | 100,000 | do | Northville, Mich. |
| | 368,000 | do | Puget Sound Stations. |
| | 245,000 | do | Saratoga, Wyo. |
| | 495,000 | do | Spearfish, S. Dak. |
| | 193,000 | do | Crawford, Nebr. |
| | 458,000 | do | Springville, Utah. |
| | 345,000 | do | White Sulphur Springs, W. Va |
| | 100,000 | do | Wytheville, Va. |
| | 10,917,000 | Madison Valley, Mont | Bozeman, Mont. |

*Transfer of eggs between stations, fiscal year 1932*—Continued

| Species | Number of eggs | From— | To— |
|---|---|---|---|
| Rainbow trout | 1,025,000 | Madison Valley, Mont | Bozeman, Mont. |
| | 100,000 | do | Glacier Park, Mont. |
| | 75,000 | Salmon, Idaho | Birdsview, Wash. |
| | 293,000 | Manchester, Iowa | La Crosse, Wis. |
| | 375,000 | Neosho, Mo | Leadville, Colo. |
| | 237,000 | do | Saratoga, Wyo. |
| | 100,000 | Bourbon, Mo | Cortland, N. Y. |
| | 250,000 | do | La Crosse, Wis. |
| | 100,000 | do | Leetown, W. Va. |
| | 25,000 | do | Springville, Utah. |
| | 75,000 | Creede, Colo | Bozeman, Mont. |
| | 211,000 | do | Leadville, Colo. |
| | 75,000 | do | Saratoga, Wyo. |
| | 75,000 | do | Crawford, Nebr. |
| | 25,000 | Eagle Nest Lake, N. Mex | Barneveld, N. Y. |
| | 300,000 | do | Leadville, Colo. |
| | 142,000 | do | Creede, Colo. |
| | 170,000 | do | Saratoga, Wyo. |
| | 6,000 | Pittsford, Vt | Cape Vincent, N. Y. |
| | 185,000 | Spearfish, S. Dak | Crawford, Nebr. |
| | 500,000 | Springville, Utah | Bozeman, Mont. |
| | 100,000 | do | Leadville, Colo. |
| | 160,000 | do | Creede, Colo. |
| | 100,000 | White Sulphur Springs, W. Va. | Leetown, W. Va. |
| | 211,000 | Wytheville, Va | White Sulphur Springs, W. Va. |
| Silver salmon | 25,000 | Applegate Creek, Oreg | Clackamas, Oreg. |
| | 750,000 | Sultan, Wash | Birdsview, Wash. |
| Sockeye salmon | 3,145,000 | Yes Bay, Alaska | Puget Sound stations. |
| Steelhead salmon | 75,000 | Birdsview, Wash | Salmon, Idaho. |
| | 50,000 | Applegate Creek, Oreg | Charlevoix, Mich. |
| | 50,000 | do | Puget Sound stations. |
| | 30,000 | Birdsview, Wash | St. Johnsbury, Vt. |

## ASSIGNMENTS OF FISH EGGS TO STATES, TERRITORIES, AND FOREIGN COUNTRIES

The following data show the extent to which the bureau is able to aid fish-cultural activities in a number of the States. While some of the shipments listed were made on an exchange basis, and others were furnished as compensation for cooperative aid extended in making the collections, a very large number of the eggs supplied to the States constitute outright donations in the interest of fish conservation work. The total of 149,501,000 eggs thus disposed of represents an increase of approximately 50,000,000 over the number supplied in the previous year. Eggs were furnished to 23 States and the Territory of Alaska, as opposed to a total of 21 States and Alaska receiving such material in 1931. It will be noted that the majority of the shipments consisted of trout and salmon eggs, the species which are most amenable to shipment and for which there is the greatest demand.

While the assignment of over 2,000,000 eggs to foreign countries represents a numerical increase over the total of the preceding year, the actual extent of such shipments was in reality curtailed, since all but 75,000 of this number consisted of trout eggs furnished to the Canadian Government on an exchange basis. The small lots of trout eggs forwarded to South America and Central America were for experimental work in the acclimatization of these forms in the countries listed. The requests of foreign governments for eggs of American fishes have diminished appreciably in recent years, indicating either that earlier shipments have sufficed to provide an initial stock or that the introduced forms have failed to thrive under the changed conditions.

*Assignments of fish eggs, fiscal year 1932*

TO STATE AND TERRITORIAL FISH COMMISSIONS

| State, or country, and species | Number |
|---|---|
| Arizona: Loch Leven trout | 1,000,000 |
| California: | |
| Atlantic salmon | 25,000 |
| Chinook salmon | 3,780,000 |
| Colorado: | |
| Black-spotted trout | 224,000 |
| Brook trout | 100,000 |
| Lake trout | 100,000 |
| Loch Leven trout | 500,000 |
| Rainbow trout | 50,000 |
| Steelhead salmon | 50,000 |
| Connecticut: Loch Leven trout | 150,000 |
| Georgia: Rainbow trout | 200,000 |
| Hawaii: Steelhead salmon | 33,000 |
| Idaho: Rainbow trout | 775,000 |
| Iowa: Rainbow trout | 101,000 |
| Maine: | |
| Atlantic salmon | 400,000 |
| Lake trout | 300,000 |
| Maryland: Rainbow trout | 100,000 |
| Massachusetts: | |
| Loch Leven trout | 100,000 |
| Rainbow trout | 50,000 |
| Michigan: Landlocked salmon | 25,000 |
| Montana: | |
| Black-spotted trout | 271,000 |
| Loch Leven trout | 5,034,000 |
| Rainbow trout | 991,000 |
| Silver salmon | 500,000 |
| Whitefish | 5,000,000 |
| Nevada: | |
| Black-spotted trout | 189,000 |
| Rainbow trout | 400,000 |
| New Mexico: | |
| Black-spotted trout | 106,000 |
| Chinook salmon | 200,000 |
| Loch Leven trout | 1,000,000 |
| Rainbow trout | 1,439,000 |
| New York: Loch Leven trout | 250,000 |
| North Carolina: | |
| Loch Leven trout | 100,000 |
| Rainbow trout | 200,000 |
| Ohio: Pike perch | 104,050,000 |
| Oregon: | |
| Black-spotted trout | 1,000,000 |
| Chinook salmon | 8,353,000 |
| Chum salmon | 400,000 |
| Silver salmon | 400,000 |
| Steelhead salmon | 630,000 |
| Tennessee: Rainbow trout | 25,000 |
| Utah: | |
| Black-spotted trout | 50,000 |
| Lake trout | 100,000 |
| Loch Leven trout | 750,000 |
| Vermont: Loch Leven trout | 75,000 |
| Washington: | |
| Black-spotted trout | 25,000 |
| Chinook salmon | 6,010,000 |
| Loch Leven trout | 200,000 |
| Wyoming: | |
| Black-spotted trout | 1,000,000 |
| Brook trout | 500,000 |
| Chinook salmon | 100,000 |
| Lake trout | 100,000 |
| Loch Leven trout | 1,000,000 |
| Rainbow trout | 925,000 |
| Silver salmon | 65,000 |
| Total | 149,501,000 |

TO FOREIGN COUNTRIES

| | |
|---|---|
| Canada: | |
| Black-spotted trout | 766,000 |
| Lake trout | 250,000 |
| Loch Leven trout | 500,000 |
| Rainbow trout | 500,000 |
| Ecuador: Rainbow trout | 25,000 |
| Panama: | |
| Brook trout | 25,000 |
| Rainbow trout | 25,000 |
| Total | 2,091,000 |

## OUTPUT OF STATIONS AND SUBSTATIONS

The bureau's 1932 output of fish was derived from 84 stations and substations, located in 35 States and the Territory of Alaska. For various reasons three of the minor egg-collecting fields occupied the previous year were not opened, reducing by that number the total of fish-producing units in operation. This year's list shows a production for the new establishments at Leetown, W. Va., and Dexter, N. Mex. All of the main stations which were on a producing basis in 1931 were in operation in 1932.

*Stations and substations operated and the output of each, fiscal year 1932*

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings, and adults | Total [1] |
|---|---|---|---|---|
| Afognak, Alaska: | | | | |
| Dolly Varden trout | 2,462,000 | | | 2,462,000 |
| Sockeye salmon | | 19,920,512 | | 19,920,512 |
| Baird, Calif: | | | | |
| Chinook salmon | 4,536,000 | | 6,240,000 | 10,776,000 |
| Battle Creek, Calif.— | | | | |
| Chinook salmon | | | 9,507,300 | 9,507,300 |
| Mill Creek, Calif.— | | | | |
| Chinook salmon | 4,284,000 | 800,000 | 3,915,000 | 8,999,000 |
| Baker Lake, Wash.: | | | | |
| Brook trout | | | 25,375 | 25,375 |
| Loch Leven trout | | | 131,600 | 131,600 |
| Silver salmon | | 15,400 | | 15,400 |
| Sockeye salmon | | | 1,426,000 | 1,426,000 |
| Birdsview, Wash.— | | | | |
| Black-spotted trout | (*) | | 96,000 | 96,000 |
| Chinook salmon | | | 1,010,000 | 1,010,000 |
| Humpback salmon | | 3,743,000 | | 3,743,000 |
| Rainbow trout | | | 69,500 | 69,500 |
| Silver salmon | | 1,668,000 | 271,000 | 1,939,000 |
| Sockeye salmon | | | 92,540 | 92,540 |
| Steelhead salmon | *143,000 | | 616,000 | 759,000 |
| Duckabush, Wash.— | | | | |
| Chinook salmon | | | 535,000 | 535,000 |
| Chum salmon | | 9,179,500 | | 9,179,500 |
| Humpback salmon | | 2,790,000 | | 2,790,000 |
| Silver salmon | | | 302,000 | 302,000 |
| Steelhead salmon | | | 19,000 | 19,000 |
| Quilcene, Wash.— | | | | |
| Black-spotted trout | | | 115,000 | 115,000 |
| Brook trout | | | 13,000 | 13,000 |
| Chinook salmon | | | 530,000 | 530,000 |
| Chum salmon | (*) | 8,127,250 | | 8,127,250 |
| Humpback salmon | | 1,978,800 | | 1,978,800 |
| Silver salmon | | 540,000 | 629,000 | 1,169,000 |
| Steelhead salmon | 50,000 | | 380,000 | 430,000 |
| Sultan, Wash.— | | | | |
| Chinook salmon | | 200,000 | | 200,000 |
| Humpback salmon | | 33,000 | | 33,000 |
| Silver salmon | (*) | 1,850,000 | 100,000 | 1,950,000 |
| Steelhead salmon | | | 270,600 | 270,600 |
| Berkshire trout hatchery, Mass.: | | | | |
| Brook trout | *7,000 | | 272,860 | 279,860 |
| Catfish | | | 7,840 | 7,840 |
| Rainbow trout | | | 1,000 | 1,000 |
| Smallmouth black bass | | 56,000 | | 56,000 |
| Boothbay Harbor, Me.: | | | | |
| Cod | 915,741,000 | | | 915,741,000 |
| Winter flounder | | 2,243,417,000 | | 2,243,417,000 |
| Bozeman, Mont.: | | | | |
| Black-spotted trout | | | 1,394,700 | 1,394,700 |
| Brook trout | | | 272,885 | 272,885 |
| Golden trout | 38,000 | | 12,096 | 50,096 |
| Landlocked salmon | | | 13,000 | 13,000 |
| Loch Leven trout | *5,740,000 | | [2] 194,325 | 5,934,325 |
| Rainbow trout | 501,000 | | 1,271,991 | 1,772,991 |
| Glacier Park, Mont.— | | | | |
| Black-spotted trout | | | 489,200 | 489,200 |
| Rainbow trout | | | 400,200 | 400,200 |
| Madison Valley, Mont.— | | | | |
| Black-spotted trout | | | 732,900 | 732,900 |
| Brook trout | (*) | | | |
| Loch Leven trout | *9,081,900 | 3,064,400 | 2,701,800 | 14,848,100 |
| Rainbow trout | *620,300 | | 906,696 | 1,526,996 |

[1] Lost in transit 96,125.

[2] In addition to 32,000 fingerling Loch Leven trout turned over to the State of Montana in cooperative work.

*Stations and substations operated and the output of each, fiscal year 1932*—Contd.

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings, and adults | Total |
|---|---|---|---|---|
| Bozeman, Mont.—Continued. | | | | |
| Miles City, Mont.— | | | | |
| Largemouth black bass | | | [3] 55,210 | 55,210 |
| Catfish | | | [4] 9,450 | 9,450 |
| Crappie | | | [5] 44,925 | 44,925 |
| Sunfish | | | [6] 595,582 | 595,582 |
| Yellow perch | | | [7] 52,287 | 52,287 |
| Miscellaneous fishes | | | [8] 15,207 | 15,207 |
| Cape Vincent, N. Y.: | | | | |
| Black-spotted trout | | 17,000 | | 17,000 |
| Brook trout | | 44,000 | | 44,000 |
| Cisco | (*) | 23,000,000 | | 23,000,000 |
| Lake trout | (*) | 121,000 | | 121,000 |
| Loch Leven trout | | 87,500 | | 87,500 |
| Rainbow trout | | | 54,000 | 54,000 |
| Smallmouth black bass | | 257,000 | 33,715 | 290,715 |
| Whitefish | | 410,000 | | 410,000 |
| Yellow perch | | 1,800,000 | | 1,800,000 |
| Barneveld, N. Y.— | | | | |
| Brook trout | | | 302,995 | 302,995 |
| Lake trout | | | 25,900 | 25,900 |
| Loch Leven trout | | | 32,600 | 32,600 |
| Rainbow trout | | | 9,700 | 9,700 |
| Ithaca, N. Y.— | | | | |
| Brook trout | | | 35,200 | 35,200 |
| Lake trout | | | 200 | 200 |
| Loch Leven trout | | | [9] 64,650 | 64,650 |
| Swanton, Vt.— | | | | |
| Common sucker | 17,275,000 | | | 17,275,000 |
| Pike perch | 33,494,000 | [10] 29,800,000 | | 63,294,000 |
| Yellow perch | | 64,100,000 | | 64,100,000 |
| Watertown, N. Y.— | | | | |
| Brook trout | | | 275,455 | 275,455 |
| Lake trout | | | 19,400 | 19,400 |
| Loch Leven trout | | | 139,500 | 139,500 |
| Rainbow trout | | | 12,300 | 12,300 |
| Clackamas, Oreg.: | | | | |
| Brook trout | 1,000 | | 1,500 | 2,500 |
| Chinook salmon | | | 1,000,000 | 1,000,000 |
| Chum salmon | | | 22,000 | 22,000 |
| Loch Leven trout | | | 120,000 | 120,000 |
| Silver salmon | | | 16,900 | 16,900 |
| Applegate Creek, Oreg.— | | | | |
| Silver salmon | 400,000 | | 299,900 | 699,900 |
| Steelhead salmon | 950,000 | | | 950,000 |
| Big White Salmon, Wash.— | | | | |
| Brook trout | | | 63,600 | 63,600 |
| Chinook salmon | 8,934,000 | 450,000 | 7,764,000 | 17,148,000 |
| Loch Leven trout | | 15,000 | 25,000 | 40,000 |
| Steelhead salmon | | | 17,650 | 17,650 |
| Little White Salmon, Wash.— | | | | |
| Chinook salmon | * 7,120,000 | | 9,680,000 | 16,800,000 |
| Chum salmon | * 400,000 | 571,000 | 292,000 | 1,263,000 |
| Rogue River, Oreg.— | | | | |
| Chinook salmon | | | 3,054,870 | 3,054,870 |
| Salmon, Idaho— | | | | |
| Black-spotted trout | | | 187,100 | 187,100 |
| Chinook salmon | | | 2,588,500 | 2,588,500 |
| Rainbow trout | * 250,000 | | [11] 837,500 | 1,087,500 |
| Cold Springs, Ga.: | | | | |
| Largemouth black bass | | 182,000 | 471,300 | 653,300 |
| Catfish | | | 2,340 | 2,340 |
| Sunfish | | | 372,500 | 372,500 |
| Valdosta, Ga.— | | | | |
| Largemouth black bass | | | 1,420 | 1,420 |
| Catfish | | | 200 | 200 |
| Sunfish | | | [12] 7,165 | 7,165 |

[3] In addition to 30,450 fingerling largemouth black bass turned over to the State of Montana in cooperative work.
[4] In addition to 7,325 fingerling catfish turned over to the State of Montana in cooperative work.
[5] In addition to 27,775 fingerling crappie turned over to the State of Montana in cooperative work.
[6] In addition to 403,225 fingerling sunfish turned over to the State of Montana in cooperative work.
[7] In addition to 42,005 fingerling yellow perch turned over to the State of Montana in cooperative work.
[8] Turned over to the State of Montana in cooperative work.
[9] In addition to 10,000 fingerling Loch Leven trout turned over to the State of New York in cooperative work.
[10] In addition to 11,018,000 fry pike perch turned over to the State of Vermont in cooperative work.
[11] In addition to 270,000 fingerling rainbow trout turned over to the State of Idaho in cooperative work.
[12] In addition to 500 fingerling sunfish turned over to the State of Texas in cooperative work.

*Stations and substations operated and the output of each, fiscal year 1932*—Contd.

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings, and adults | Total |
|---|---|---|---|---|
| Craig Brook, Me.: | | | | |
| Atlantic salmon | * 425,000 | | 537,150 | 962,150 |
| Brook trout | (*) | | 905,150 | 905,150 |
| Landlocked salmon | * 50,000 | | [13] 595,900 | 645,900 |
| Grand Lake Stream, Me.— | | | | |
| Atlantic salmon | | | 151,300 | 151,300 |
| Brook trout | | | 30,370 | 30,370 |
| Landlocked salmon | (*) | | 297,900 | 297,900 |
| Dexter, N. Mex.: | | | | |
| Largemouth black bass | | [14] 18,000 | [15] 48,450 | 66,450 |
| Duluth, Minn.: | | | | |
| Brook trout | | | 167,900 | 167,900 |
| Lake trout | 150,000 | 6,750,000 | [16] 1,209,750 | 8,109,750 |
| Pike perch | | 15,960,000 | | 15,960,000 |
| Whitefish | | 870,000 | | 870,000 |
| Edenton, N. C.: | | | | |
| Largemouth black bass | | [17] 371,500 | [18] 84,355 | 455,855 |
| Crappie | | | 450 | 450 |
| Glut herring | | 55,000,000 | | 55,000,000 |
| Sunfish | | | [19] 1,805 | 1,805 |
| White perch | | 7,000,000 | | 7,000,000 |
| Yellow perch | | [20] 4,500,000 | 300 | 4,500,300 |
| Weldon, N. C.— | | | | |
| Striped bass | | 1,676,000 | | 1,676,000 |
| Erwin Tenn.: | | | | |
| Largemouth black bass | | | 36,000 | 36,000 |
| Brook trout | | | 264,700 | 264,700 |
| Rainbow trout | | | [21] 67,303 | 67,303 |
| Rock bass | | | 6,455 | 6,455 |
| Sunfish | | | 24,056 | 24,056 |
| Fairport, Iowa: | | | | |
| Largemouth black bass | | | 56,540 | 56,540 |
| Crappie | | | 16,250 | 16,250 |
| Smallmouth black bass | | | 13,805 | 13,805 |
| Sunfish | | | 4,660 | 4,660 |
| Fort Humphreys, Va.: | | | | |
| Shad | | 29,757,000 | | 29,757,000 |
| Yellow perch | | [22] 97,452,000 | 804 | 97,452,804 |
| Dumfries, Va.— | | | | |
| Largemouth black bass | | | 1,100 | 1,100 |
| Common pike | | | 1,500 | 1,500 |
| Yellow perch | | 14,040,000 | | 14,040,000 |
| Featherstone, Va.— | | | | |
| Largemouth black bass | | | 3,500 | 3,500 |
| Sunfish | | | 25,000 | 25,000 |
| Lakeland, Md.— | | | | |
| Largemouth black bass | | 187,500 | 2,265 | 189,765 |
| Crappie | | | 275 | 275 |
| Sunfish | | | 65,000 | 65,000 |
| Ogletown, Pa.— | | | | |
| Brook trout | | | 31,000 | 31,000 |
| Gloucester, Mass.: | | | | |
| Cod | 354,322,000 | 272,969,000 | | 627,291,000 |
| Haddock | 283,544,000 | 76,242,000 | | 359,786,000 |
| Pollock | | 14,670,000 | | 14,670,000 |
| Winter flounder | | 53,085,000 | | 53,085,000 |
| La Crosse, Wis.: | | | | |
| Largemouth black bass | | | [23] 62,965 | 62,965 |
| Brook trout | | | 443,270 | 443,270 |
| Buffalofish | | | 15,975 | 15,975 |
| Carp | | | 2,746,000 | 2,746,000 |
| Catfish | | | 2,010,000 | 2,010,000 |
| Crappie | | | [24] 799,740 | 799,740 |
| Loch Leven trout | | | 275,900 | 275,900 |

[13] In addition to 9,000 fingerling landlocked salmon turned over to the State of Maine in cooperative work.
[14] Turned over to the State of New Mexico in cooperative work.
[15] In addition to 16,000 fingerling largemouth black bass turned over to the State of New Mexico in cooperative work.
[16] In addition to 237,250 fingerling lake trout turned over to the State of Minnesota in cooperative work.
[17] In addition to 68,000 fry largemouth black bass turned over to the State of North Carolina in cooperative work.
[18] In addition to 64,200 fingerling largemouth black bass turned over to the State of North Carolina in cooperative work.
[19] In addition to 100 fingerling sunfish turned over to the State of North Carolina in cooperative work.
[20] In addition to 400,000 fry yellow perch turned over to the State of North Carolina in cooperative work.
[21] In addition to 15,000 fingerling rainbow trout turned over to the State of Georgia in cooperative work.
[22] In addition to 79,300,000 fry yellow perch turned over to the State of Virginia in cooperative work.
[23] In addition to 1,500 fingerling largemouth black bass turned over to the State of Wisconsin in cooperative work.
[24] In addition to 7,000 fingerling crappie turned over to the State of Wisconsin in cooperative work.

*Stations and substations operated and the output of each, fiscal year 1932*—Contd.

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings, and adults | Total |
|---|---|---|---|---|
| La Crosse, Wis.—Continued. | | | | |
| Pike and pickerel | | | 10,625 | 10,625 |
| Rainbow trout | | | 253,200 | 253,200 |
| Sunfish | | | [25] 940,075 | 940,075 |
| White bass | | | 900 | 900 |
| Yellow perch | | | 16,590 | 16,590 |
| Miscellaneous fishes | | | 250,700 | 250,700 |
| Bellevue, Iowa— | | | | |
| Largemouth black bass | | | 8,365 | 8,365 |
| Buffalofish | | 164,150,000 | 204,300 | 164,354,300 |
| Carp | | 114,000,000 | 8,609,000 | 122,009,000 |
| Catfish | | | 53,200 | 53,200 |
| Crappie | | | 45,400 | 45,400 |
| Fresh-water drum | | | 120 | 120 |
| Pike and pickerel | | | 80 | 80 |
| Sunfish | | | 588,200 | 588,200 |
| White bass | | | 12,860 | 12,860 |
| Yellow perch | | | 60 | 60 |
| Miscellaneous fishes | | | 257,300 | 257,300 |
| Guttenburg, Iowa— | | | | |
| Buffalofish | 17,850,000 | | | 17,850,000 |
| Carp | 28,000,000 | | | 28,000,000 |
| Harpers Ferry, Iowa— | | | | |
| Buffalofish | 73,255,000 | | | 73,255,000 |
| Carp | 85,000,000 | | | 85,000,000 |
| Homer, Minn.— | | | | |
| Largemouth black bass | | | 143,815 | 143,815 |
| Buffalofish | | | 24,655 | 24,655 |
| Carp | | | 3,423,100 | 3,423,100 |
| Catfish | | | 3,329,450 | 3,329,450 |
| Crappie | | | 3,690,200 | 3,690,200 |
| Fresh-water drum | | | 525,230 | 525,230 |
| Pike and pickerel | | | 11,770 | 11,770 |
| Sunfish | | | 4,374,000 | 4,374,000 |
| White bass | | | 1,805 | 1,805 |
| Yellow perch | | | 211,180 | 211,180 |
| Miscellaneous fishes | | | 2,276,345 | 2,276,345 |
| Lynxville, Wis.— | | | | |
| Largemouth black bass | | | [26] 26,840 | 26,840 |
| Buffalofish | | | 134,900 | 134,900 |
| Carp | | | 2,312,500 | 2,312,500 |
| Catfish | | | 2,311,980 | 2,311,980 |
| Crappie | | | [27] 937,100 | 937,100 |
| Fresh-water drum | | | 25 | 25 |
| Pike and pickerel | | | 28,235 | 28,235 |
| Sunfish | | | [28] 1,258,500 | 1,258,500 |
| White bass | | | 1,025 | 1,025 |
| Yellow perch | | | 36,150 | 36,150 |
| Miscellaneous fishes | | | 121,525 | 121,525 |
| Marquette, Iowa— | | | | |
| Largemouth black bass | | | 16,082 | 16,082 |
| Buffalofish | | | 221,000 | 221,000 |
| Carp | | | 2,390,000 | 2,390,000 |
| Catfish | | | 4,355,000 | 4,355,000 |
| Crappie | | | 1,273,000 | 1,273,000 |
| Pike and pickerel | | | 7,775 | 7,775 |
| Sunfish | | | 732,000 | 732,000 |
| White bass | | | 75 | 75 |
| Yellow perch | | | 8,950 | 8,950 |
| Miscellaneous fishes | | | 254,700 | 254,700 |
| Leadville, Colo.: | | | | |
| Black-spotted trout | | | 296,600 | 296,600 |
| Brook trout | * 1,205,000 | | 3,581,000 | 4,786,000 |
| Loch Leven trout | | | 65,000 | 65,000 |
| Rainbow trout | | | 602,350 | 602,350 |
| Creede, Colo.— | | | | |
| Black-spotted trout | * 100,400 | | 655,120 | 755,520 |
| Brook trout | (*) | | 1,289,780 | 1,289,780 |
| Loch Leven trout | | | 258,690 | 258,690 |
| Rainbow trout | * 50,160 | | 551,750 | 601,910 |

[25] In addition to 35,250 fingerling sunfish turned over to the State of Wisconsin in cooperative work.
[26] In addition to 650 fingerling largemouth black bass turned over to the State of Wisconsin in cooperative work.
[27] In addition to 7,870 fingerling crappie turned over to the State of Wisconsin in cooperative work.
[28] In addition to 106,005 fingerling sunfish turned over to the State of Wisconsin in cooperative work.

*Stations and substations operated and the output of each, fiscal year 1932*—Contd.

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings, and adults | Total |
|---|---|---|---|---|
| Leadville, Colo.—Continued. | | | | |
| Eagle Nest Lake, N. Mex.— | | | | |
| Rainbow trout | * 820,000 | | 205,000 | 1,025,000 |
| Leetown, W. Va.: | | | | |
| Brook trout | | | 80,100 | 80,100 |
| Loch Leven trout | | | 100 | 100 |
| Rainbow trout | | | 50,100 | 50,100 |
| Louisville, Ky.: | | | | |
| Largemouth black bass | | 45,000 | 12,020 | 57,020 |
| Crappie | | | 500 | 500 |
| Rock bass | | | 300 | 300 |
| Smallmouth black bass | | 178,000 | [29] 5,132 | 183,132 |
| Sunfish | | | 2,300 | 2,300 |
| Mammoth Spring, Ark.: | | | | |
| Largemouth black bass | | | 171,470 | 171,470 |
| Rock bass | | | 42,500 | 42,500 |
| Smallmouth black bass | | | 177,350 | 177,350 |
| Sunfish | | | 55,500 | 55,500 |
| Lonoke, Ark. (in cooperation with State)— | | | | |
| Largemouth black bass | | | 15,900 | 15,900 |
| Catfish | | | 150 | 150 |
| Crappie | | | 400 | 400 |
| Rock bass | | | 2,000 | 2,000 |
| Sunfish | | | 2,600 | 2,600 |
| Manchester, Iowa: | | | | |
| Brook trout | | | [30] 806,650 | 806,650 |
| Rainbow trout | * 235,000 | | [31] 300,000 | 535,000 |
| Rock bass | | | 5,000 | 5,000 |
| Smallmouth black bass | | | 3,200 | 3,200 |
| Nashua, N. H.: | | | | |
| Atlantic salmon | | | [32] 5,000 | 5,000 |
| Brook trout | | | 358,370 | 358,370 |
| Catfish | | | 630 | 630 |
| Landlocked salmon | | | [33] 15,000 | 15,000 |
| Rainbow trout | | | 24,800 | 24,800 |
| Smallmouth black bass | | 150,500 | 900 | 151,400 |
| Neosho, Mo.: | | | | |
| Largemouth black bass | | | 86,533 | 86,533 |
| Catfish | | | 1,500 | 1,500 |
| Crappie | | | 70,750 | 70,750 |
| Loch Leven trout | | | 1,310 | 1,310 |
| Rainbow trout | (*) | | [34] 165,722 | 165,722 |
| Rock bass | | | 2,500 | 2,500 |
| Sunfish | | | 45,450 | 45,450 |
| Bourbon, Mo.— | | | | |
| Rainbow trout | * 1,820,000 | | | 1,820,000 |
| Langdon, Kans.— | | | | |
| Largemouth black bass | | | 87,745 | 87,745 |
| Catfish | | | 44,710 | 44,710 |
| Crappie | | | 25,250 | 25,250 |
| Sunfish | | | 57,055 | 57,055 |
| Yellow perch | | | 5,220 | 5,220 |
| Tishomingo, Okla.— | | | | |
| Largemouth black bass | | | 5,172 | 5,172 |
| Catfish | | | 127 | 127 |
| Crappie | | | 7,140 | 7,140 |
| Sunfish | | | 161,292 | 161,292 |
| Northville, Mich.: | | | | |
| Brook trout | | | 1,251,950 | 1,251,950 |
| Loch Leven trout | | | 87,800 | 87,800 |
| Rainbow trout | | | 84,800 | 84,000 |
| Smallmouth black bass | | | 11,100 | 11,100 |
| Alpena, Mich.— | | | | |
| Lake trout | | 487,750 | | 487,750 |
| Pike perch | | [35] 26,500,000 | | 26,500,000 |

[29] In addition to 1,500 fingerling smallmouth black bass turned over to the State of Maryland in cooperative work.
[30] In addition to 9,600 fingerling brook trout turned over to the State of Iowa in cooperative work.
[31] In addition to 56,000 fingerling rainbow trout turned over to the State of Iowa in cooperative work.
[32] Turned over to the State of New Hampshire in cooperative work.
[33] Turned over to the State of New Hampshire in cooperative work.
[34] In addition to 9,546 fingerling rainbow trout turned over to the State of Kansas in cooperative work.
[35] In addition to 1,000,000 fry pike perch turned over to the State of Michigan in cooperative work.

*Stations and substations operated and the output of each, fiscal year 1932*—Contd.

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings, and adults | Total |
|---|---|---|---|---|
| Northville, Mich.—Continued. | | | | |
| Charlevoix, Mich.— | | | | |
| Lake trout | 725,000 | [36] 16,091,000 | | 16,816,000 |
| Pike perch | | 10,300,000 | | 10,300,000 |
| Steelhead salmon | | | 49,000 | 49,000 |
| Whitefish | 5,000,000 | [37] 2,600,000 | | 7,600,000 |
| Orangeburg, S. C.: | | | | |
| Largemouth black bass | | | 217,782 | 217,782 |
| Sunfish | | | 98,217 | 98,217 |
| Warmouth bass | | | 5,915 | 5,915 |
| Put in Bay, Ohio: | | | | |
| Pike perch | 114,050,000 | 171,500,000 | | 285,550,000 |
| Whitefish | | 61,000,000 | | 61,000,000 |
| Quinault, Wash.: | | | | |
| Chinook salmon | 6,000 | | 24,600 | 30,600 |
| Silver salmon | 1,015,740 | 16,158,000 | | 17,173,740 |
| Sockeye salmon | | 9,458,000 | 2,053,735 | 11,511,735 |
| St. Johnsbury, Vt.: | | | | |
| Largemouth black bass | | | 1,075 | 1,075 |
| Brook trout | | 1,188,000 | 22,259 | 1,210,259 |
| Landlocked salmon | | 10,000 | 14,841 | 24,841 |
| Loch Leven trout | | | 6,050 | 6,050 |
| Steelhead salmon | | | 27,275 | 27,275 |
| Pittsford, Vt.— | | | | |
| Black-spotted trout | (*) | | 2,530 | 2,530 |
| Brook trout | (*) | | 67,196 | 67,196 |
| Grayling | (*) | | 1,093 | 1,093 |
| Rainbow trout | (*) | | 5,071 | 5,071 |
| York Pond, N. H.— | | | | |
| Brook trout | | 386,222 | [38] 391,312 | 777,534 |
| San Marcos, Tex.: | | | | |
| Largemouth black bass | | 143,000 | 109,070 | 252,070 |
| Catfish | | | 850 | 850 |
| Crappie | | | 8,480 | 8,480 |
| Rio Grande perch | | | 16,300 | 16,300 |
| Rock bass | | | 400 | 400 |
| Sunfish | | | 37,825 | 37,825 |
| Warmouth bass | | | 200 | 200 |
| Lake Worth, Tex.— | | | | |
| Largemouth black bass | | 39,000 | 190,490 | 229,490 |
| Crappie | | | 8,575 | 8,575 |
| Sunfish | | | 114,305 | 114,305 |
| Warmouth bass | | | 900 | 900 |
| Saratoga, Wyo.: | | | | |
| Black-spotted trout | | | 607,350 | 607,350 |
| Brook trout | | | 617,450 | 617,450 |
| Loch Leven trout | | | 139,600 | 139,600 |
| Rainbow trout | | | 342,100 | 342,100 |
| Spearfish, S. Dak.: | | | | |
| Brook trout | | | 544,065 | 544,065 |
| Loch Leven trout | | | 455,450 | 455,450 |
| Rainbow trout | * 134,610 | | 92,708 | 227,318 |
| Crawford, Nebr.— | | | | |
| Largemouth black bass | | | 10,300 | 10,300 |
| Brook trout | | | 140,000 | 140,000 |
| Catfish | | | 42,350 | 42,350 |
| Loch Leven trout | | | 143,000 | 143,000 |
| Rainbow trout | | | 133,260 | 133,260 |
| Sunfish | | | 3,000 | 3,000 |
| Yellow perch | | | 47,900 | 47,900 |
| Springville, Utah: | | | | |
| Black-spotted trout | * 346,000 | [39] 379,000 | [40] 748,275 | 1,473,275 |
| Brook trout | (*) | | 241,000 | 241,000 |
| Loch Leven trout | | | 45,000 | 45,000 |
| Rainbow trout | * 1,150,000 | | [41] 701,591 | 1,851,591 |
| Tupelo, Miss.: | | | | |
| Largemouth black bass | | 300,500 | 99,765 | 400,265 |
| Sunfish | | | 457,225 | 457,225 |
| Aliceville, Ala.— | | | | |
| Largemouth black bass | | | 8,525 | 8,525 |
| Sunfish | | | 34,350 | 34,350 |

[36] In addition to 14,241,000 fry lake trout turned over to the State of Michigan in cooperative work.
[37] In addition to 1,000,000 fry whitefish turned over to the State of Michigan in cooperative work.
[38] In addition to 400 fingerling brook trout turned over to the State of New Hampshire in cooperative work.
[39] Turned over to the State of Nevada in cooperative work.
[40] In addition to 16,900 fingerling black-spotted trout turned over to the State of Utah in cooperative work.
[41] In addition to 4,700 fingerling rainbow trout turned over to the State of Utah in cooperative work.

*Stations and substations operated and the output of each, fiscal year 1932*—Contd.

[Asterisk (*) denotes transfer of eggs. See table, p. 542]

| Stations, substations, and species | Eggs | Fry | Fingerlings, yearlings and adults | Total |
|---|---|---|---|---|
| White Sulphur Springs, W. Va.: | | | | |
| Largemouth black bass | | | 40,000 | 40,000 |
| Brook trout | 25,000 | | [43] 2,066,066 | 2,091,066 |
| Loch Leven trout | | | 232,200 | 232,200 |
| Rainbow trout | 350,600 | | [44] 672,740 | 1,023,340 |
| Rock bass | | | 8,106 | 8,106 |
| Sunfish | | | 45,000 | 45,000 |
| Woods Hole, Mass.: | | | | |
| Cod | 14,495,000 | 71,239,000 | | 85,734,000 |
| Haddock | 440,365,000 | | | 440,365,000 |
| Mackerel | | 15,245,000 | | 15,245,000 |
| White perch | | | 325 | 325 |
| Winter flounder | 81,965,000 | 680,657,000 | | 762,632,000 |
| Wytheville, Va.: | | | | |
| Largemouth black bass | | 12,000 | 64,758 | 76,758 |
| Brook trout | | | [45] 319,740 | 319,740 |
| Catfish | | | [46] 4,436 | 4,436 |
| Loch Leven trout | | | 39,300 | 39,300 |
| Rainbow trout | * 100,000 | | [46] 317,165 | 417,165 |
| Rock bass | | | 9,806 | 9,806 |
| Smallmouth black bass | | | 1,029 | 1,029 |
| Sunfish | | | 83,292 | 83,292 |
| Yellowstone Park, Wyo.: | | | | |
| Black-spotted trout | * 7,337,000 | | 3,146,000 | 10,483,000 |
| Grayling | | 40,000 | | 40,000 |
| Yes Bay, Alaska: | | | | |
| Brook trout | | | 77,050 | 77,050 |
| Humpback salmon | | 317,000 | | 317,000 |
| Sockeye salmon | 3,144,960 | | | 3,144,960 |

[43] In addition to 874,200 fingerling brook trout turned over to the State of West Virginia and 5,000 turned over to the State of Virginia in cooperative work.
[44] In addition to 1,400 fingerling rainbow trout turned over to the State of Kentucky and 229,015 turned over to the State of West Virginia in cooperative work.
[45] In addition to 89,900 fingerling brook trout turned over to the State of Virginia and 6,350 turned over to the State of West Virginia in cooperative work.
[46] In addition to 750 fingerling catfish turned over to the State of West Virginia in cooperative work.
[46] In addition to 10,100 fingerling rainbow trout turned over to the State of Virginia and 4,125 turned over to the State of West Virginia in cooperative work.

## EGG COLLECTIONS

The collection of eggs, both from station brood stock and from wild fish, including those taken as a by-product of the commercial fisheries, shows a decline of over a billion as compared with the collections of the previous year. The greater part of this drop is due to a sharp curtailment in the take of winter flounder eggs, the collections of that species being less than in 1931 to the extent of over 900,000,000. Scattering declines will also be noted in the egg collections of whitefish, cisco, all species of Pacific salmon except the sockeye, rainbow trout, black-spotted trout and lake trout, and in other minor groups. It is noteworthy that notwithstanding this rather marked decline in egg collections the drop in output or actual production of fish was considerably less than proportional, indicating a higher percentage of results in hatching and rearing.

*Comparison of egg collections, fiscal years 1932 and 1931*

| Species | 1932 | 1931 |
|---|---|---|
| Buffalofish | | 103, 162, 000 |
| White sucker | 17, 275, 000 | 7, 375, 000 |
| Carp | | 113, 250, 000 |
| Shad | 37, 342, 000 | 19, 122, 000 |
| Glut herring | 117, 220, 000 | 104, 715, 000 |
| Whitefish | 133, 215, 000 | 359, 122, 000 |
| Cisco | 35, 200, 000 | 92, 520, 000 |
| Chinook salmon | 73, 432, 400 | 64, 770, 500 |
| Chum salmon | 20, 035, 000 | 19, 560, 000 |
| Humpback salmon | 8, 432, 000 | 20, 726, 670 |
| Silver salmon | 8, 168, 300 | 9, 333, 500 |
| Sockeye salmon | 69, 123, 220 | 54, 999, 270 |
| Steelhead salmon | 2, 791, 000 | 3, 670, 430 |
| Landlocked salmon | 994, 980 | 1, 241, 720 |
| Rainbow trout | 18, 807, 710 | 22, 327, 230 |
| Black-spotted trout | 11, 484, 300 | 25, 417, 000 |
| Loch Leven trout | 21, 674, 200 | 20, 502, 700 |
| Lake trout | 43, 982, 930 | 68, 649, 800 |
| Brook trout | 24, 115, 810 | 13, 005, 150 |
| Dolly Varden trout | 2, 731, 420 | |
| Grayling | 768, 000 | 1, 000, 000 |
| Pike perch | 717, 393, 190 | 564, 240, 000 |
| Yellow perch | 178, 080, 000 | 131, 640, 000 |
| Striped bass | 2, 095, 000 | 13, 370, 000 |
| White perch | 13, 700, 000 | |
| Cod | 1, 715, 437, 000 | 1, 632, 253, 000 |
| Haddock | 820, 894, 000 | 421, 524, 000. |
| Pollock | 21, 212, 000 | 388, 130, 000 |
| Winter flounder | 3, 398, 941, 000 | 4, 333, 487, 000 |
| Mackerel | 16, 782, 000 | 12, 050, 000. |
| Total | 7, 531, 227, 460 | 8, 621, 163, 970 |

## NOTES ON OPERATIONS

### COMMERCIAL SPECIES

*Pacific salmons.*—In the Pacific coast field, including Alaska, the main activity is the propagation of salmon, with the object of maintaining the important industry dependent upon the fisheries for these species. In connection with this work during 1932 there was a moderate decrease in the output of all the Pacific salmons with the exception of the chum and the steelhead salmons. In certain areas, however, particularly in California, where hatcheries are operated at Baird and near-by substations, and on the Columbia River, capacity collections of eggs were made, and a considerable portion of the run was allowed to spawn naturally, due to insufficient room to care for the eggs. In the Puget Sound field, where five stations are operated, one of the most striking features was the damage caused by floods during the early spring. In the Columbia River area salmon flesh to the extent of more than 14 tons was frozen and held in cold storage for the purpose of feeding it to the millions of fish held for rearing to fingerling size. It was reported that at the Yes Bay (Alaska) station one of the best runs of sockeye salmon noted in years was in evidence.

Various major improvements were made at a number of points, including a complete rehabilitation of the water supply system for the Clackamas (Oreg.) station, which comprised a new pump and replacement of the water-supply line. Over a half-mile length of new water-supply line was also installed at the Little White Salmon (Wash.) substation. Salmon propagation at the Snake River (Idaho) substation gave unsatisfactory results but a considerable degree of success attended the handling of rainbow trout. A discussion of the construc-

tion of a new hatchery at Butte Falls, Oreg., appears elsewhere. Extensive marking experiments, for the purpose of securing data on the migration of sockeye salmon, were conducted by the superintendent of the Birdsview (Wash.) station. A new highway, permitting access by means other than the pack-horse method to the Baker Lake (Wash.) station, was under construction by the United States Bureau of Public Roads. Close observation of the run of salmon in Baker River, so seriously affected by the large power dam at Concrete, Wash., was maintained during the year and revealed a run somewhat larger than that of the previous year. It is becoming increasingly evident, however, that this structure is having a most injurious effect upon an important fishery resource.

*Great Lakes species.*—Output figures show a decline from last year in all of the commercial species of the Great Lakes with the exception of pike perch. Whitefish and cisco were produced in numbers materially less than in the previous year. The unusually prolonged period of warm weather prevailing during the late fall and early winter had a noticeable effect on the collections of whitefish and lake trout eggs, and it resulted in a somewhat poor quality of eggs taken during the early part of the season.

The work with the commercial species was quite heavily curtailed in the New York field. Only negligible quantities of whitefish and lake trout eggs were secured from Lake Ontario for stocking the Cape Vincent hatchery, and the cisco (lake herring) egg collections were sharply reduced from the average production. Extensive subsidiary activities connected with the propagation of game fish were in progress at the Cape Vincent station, however. This work comprises the operation of smallmouth bass ponds and the results of the year's work were very successful, almost 300,000 fingerlings and advanced fry being produced and distributed. The artificial cultivation of daphnia, a live food for the young bass, has been developed at this station to a high degree of practical efficiency. The Cape Vincent station also maintains substations for the rearing of trout at Barneveld, Cortland, and Watertown, N. Y., and from these points approximately 1,000,000 trout of four species were distributed in the course of the year. The substation at Swanton, Vt., maintained cooperatively by the States of Pennsylvania and Vermont and the Bureau of Fisheries, is administered by the Cape Vincent station for the propagation of pike perch. During the early part of the spawning season weather and other conditions indicated that the output of pike perch would be limited. Toward the close of the season, however, a large number of fish appeared on the spawning grounds and egg collections were increased to a very satisfactory degree.

Throughout the entire Great Lakes area there was a phenomenal run of pike perch during the spawning season, with the result that all of the bureau's Michigan hatcheries and the hatchery at Put-in Bay, Ohio, were filled to capacity with eggs, as were also the State hatcheries within this area. Furthermore, the eggs were of good quality and an excellent percentage of hatch was attained. The closure of Isle Royale (Mich.) waters to commercial fishing materially reduced the collection of lake trout and whitefish eggs in the Minnesota field, and approximately 8,000,000 lake trout and less than 1,000,000 whitefish constituted the year's output of these species from the Duluth hatchery. Pike perch eggs, collected in cooperation with the State

of Minnesota, were also incubated at the Duluth station. In the Michigan field the handling of eggs of the commercial species was on a limited scale at the Alpena substation. On the other hand, quite satisfactory egg collections were obtained for the Charlevoix hatchery, though the quality of some of them was below normal, thus curtailing the year's output. Operations at the main station at Northville, Mich., were confined to the propagation of game fishes, including the trouts and the smallmouth bass. This work was conducted on the usual basis with a normal output, notwithstanding the fact that the trout rearing operations were somewhat complicated by an outbreak of disease. The two large cooperative trout nurseries supervised by the Northville station yielded satisfactory results.

*Marine species.*—From a numerical standpoint the three marine stations in New England handled more eggs and fish by far than the remainder of the bureau's hatcheries combined. An outstanding feature of the year's work was the unfavorable season for pollock propagation at the Gloucester (Mass.) station. The prevailing low market prices discouraged fishing and prevented satisfactory egg collections. The cod output in this field was somewhat below normal, but a very successful season was experienced in the propagation of haddock. It is the practice at Gloucester station to detail spawn-takers to the commercial fishing vessels operating in the offshore waters for the purpose of fertilizing eggs of the cod and haddock and planting them on the fishing grounds of the region. During the season over 130,000,000 eggs of these species were thus salvaged. The attempts made to handle flatfish or flounder at Gloucester failed to produce average results, due to the destruction of fishing gear by storms.

At the Boothbay Harbor (Me.) station an extensive program of overhauling and renovating the plant, including residences, docks, etc., was carried on throughout the year. The output of flat fish was lower than that of the previous year, due to the smaller average egg yield, which amounted to 181,000 per fish in comparison with an average of 250,000 in previous years. The same conditions which curtailed pollock operations at Gloucester restricted the output of the Boothbay Harbor hatchery, the prevailing low prices discouraging fishing and making it difficult to obtain eggs in satisfactory numbers.

The propagation of cod, winter flounder, and mackerel is only one of the numerous activities carried on at the Woods Hole (Mass.) station. The station personnel is responsible for the upkeep of the extensive structures and equipment needed for scientific investigations and the fish-cultural work. During the year a new concrete floor was installed in the hatching room, replacing an old wooden floor in bad condition. Considerable work was also required in connection with the upkeep of the station residences and water supply system. The output of cod closely approximated the average production over a period of years. A satisfactory season was experienced in the propagation of winter flounder and nearly 17,000,000 mackerel eggs were secured from local traps and incubated. In connection with flounder propagation over 1,000 adult fish were marked or tagged for scientific purposes before being released.

*Commercial anadromous species of the Atlantic coast.*—Several of the Atlantic coast stations propagate commercial anadromous forms in addition to the cultivation of other species of fish. These stations

are located at East Orland, Me., Edenton, N. C., Fort Humphreys, Va., and Orangeburg, S. C. The station at East Orland, Me., receives annually an allotment of Atlantic salmon eggs from the Canadian Government, the quantity varying with the supply available in Canada and the number of trout eggs which can be furnished from the bureau's hatcheries in exchange. During the past year the station received a million eggs and allotted approximately half of them to the State hatcheries in Maine. Normal success was attained in the incubation of the eggs and the distribution of the resulting fry. It is reported that while the run of salmon in the Penobscot River was not as large as in the previous year, an improvement over conditions existing in recent years was evident and the fish taken were of excellent size. The imposition of restrictions on commercial fishing for this species, together with continued distributions of fingerling salmon by the State of Maine and the bureau should result in a decided improvement in the status of this desirable commercial and sport fish.

Adverse weather conditions at the Edenton station restricted the collection of yellow perch breeders and curtailed the output of that species to 4,500,000 fry. Though satisfactory catches of shad were reported by fishermen in the lower portions of Albemarle Sound, no shad propagation whatever was possible at Edenton, owing to an entire absence of mature roe shad on the spawning grounds accessible to the station in its upper reaches. The Fort Humphreys station, which comprises the principal shad hatching unit in the United States at the present time, reported an average season in the propagation of yellow perch and a distribution of 29,000,000 shad fry, this number exceeding somewhat the shad production of the previous year. In cooperation with the State of South Carolina, the Orangeburg station, primarily a pond-fish plant, conducted shad propagation at two temporary field hatcheries at Jacksonboro and Yemassee, S. C. The output of slightly less than 3,000,000 fry was practically the same as the results of the previous year's work in these fields.

### ROCKY MOUNTAIN GAME FISH PROPAGATION

Notwithstanding the vast area, the comparatively sparse population, and the extensive stream mileage, the fish-hatchery work in the Rocky Mountain section, both Federal and State, is proving a very important factor in maintaining this part of the country as one of the outstanding trout-angling territories on the North American continent. The importance of the Federal fish-cultural work is intensified by the tremendous acreage of the public domain, which includes national forests, national parks, Indian reservations, and reclamation districts, all of them depending heavily upon strictly Federal hatcheries for the maintenance of the fish supply in their waters. In addition to producing large numbers of fry, fingerling, and larger trout for stocking Rocky Mountain areas, collections of eggs from wild trout yield a surplus available for transfer to State and Federal hatcheries in other sections of the United States, where the production of domesticated eggs is impracticable and their purchase expensive. The Meadow Creek substation, operated as an auxiliary of the Bozeman (Mont.) station, is located in one of the most productive

fields in this district. At this point collections of Loch Leven trout eggs in excess of 15,000,000 are available annually for maintaining the local supply and for shipment on an extensive scale to other parts of the country. The main station at Bozeman experienced a highly successful year, producing an output requiring 25 trips of the bureau's railroad cars to distribute, in addition to 12 loads carried by tank trucks. Operations at the Miles City (Mont.) substation, constituting the largest pond fish cultural unit in the Northwest, are directed jointly by the Bozeman station and the Montana Fish and Game Commission. During 1932 this unit produced over 600,000 pond fish, including black bass, crappie, sunfish, catfish, and minor species. Its efficiency was materially increased by the construction of a new water supply ditch 1¼ miles in length.

Included for administrative reasons within the Rocky Mountain group is the Crawford (Nebr.) unit, which is gradually expanding its production of pond fish by the establishment of ponds on the Fort Robinson Military Reservation. The Spearfish (S. Dak.) hatchery, which serves the Black Hills region, is now concentrating on the production of larger sized fish in preference to increased numbers. The work at that point was hampered by the virtual disappearance of the hatchery spring water supply during the early spring. By resorting to various expedients the crop of fish was cared for and on resumption of the normal flow it became evident that the season's output would not be seriously affected.

Second only to the Bozeman station is the Leadville (Colo.) hatchery with its two auxiliaries at Creede and Crystal Lake, near Leadville, the last named now being in course of establishment. The constructions to date have consisted of a dwelling, service buildings, and a water-supply system, preparatory to the installation of rearing ponds. A lake on the property has been stocked with 75,000 brook trout fingerlings. The main station at Leadville made its usual field collections of brook and rainbow trout eggs, amounting close to 8,500,000. The efficiency of the Creede substation has been materially increased by the provision of a new water supply adequate for the full capacity of the hatchery.

Rainbow-trout operations at the Saratoga (Wyo.) station were hampered by the recent draining of the Pathfinder Reservoir, which in the past has yielded millions of eggs of this species. Satisfactory egg collections were secured for the Springville (Utah) station but severe epidemics occurring during the fry stages of the resulting fish caused a very heavy mortality among all species of trout on hand. An investigation traced these losses to a bacterial infection, which arose apparently from the unprotected water supply. Various expedients, including improvement of the spring source and the use of city water, are being planned for in an effort to avert this difficulty in future. The Springville station has now built up a sufficient stock of brood rainbow trout to enable it to ship a number of eggs to other points. As the season for the propagation of black-spotted trout in the Yellowstone Park extends through June into the late summer, a report on the year's operations must necessarily include only part of the work performed during any given season. Egg collections in this field during the spring of 1932 amounted to 17,500,000, exceeding the take of the two previous years. Experimental lots of grayling eggs were handled also. An extensive series of rearing pools in course of

construction at the Mammoth Hot Springs auxiliary was completed and placed in operation during the fish-cultural season. With the completion of the residences now undergoing construction the Yellowstone Park unit will be one of the most adequate and complete of the bureau's hatcheries.

The establishment of the new pond fish cultural station at Dexter, N. Mex., was started on October 7, 1931, and by the end of the fiscal year the work had been carried to a point making possible a distribution of over 50,000 bass, with a large number of fingerlings remaining in the ponds for later shipment. Three residences, a garage and shop building, an office building, and a pump house were erected; and a pond area comprising almost 100 acres was completed and placed in service, making this station one of the largest bass and pond fish plants operated by the bureau. The rapidity with which this station was placed on a productive basis is noteworthy, and it was particularly needed for the propagation of warm water fish for stocking an extensive area throughout the Southwest which is not suitable for trout.

In addition to the strictly fish-cultural work conducted in Rocky Mountain territory investigations previously undertaken in connection with a biological study of the national parks and national forests were continued. As a result of these inquiries reports were rendered as a basis for a stocking policy on 15 separate national forests in Colorado, Wyoming, and Utah, and on the Rocky Mountain National Park. Biological surveys of a more scientific character were made by field parties of the waters of Teton National Park and the Wasatch National Forest, in Utah, and near the close of the fiscal year a party of investigators had entered Glacier National Park to resume studies previously instituted along the same lines. It is interesting to note in this connection that the Wasatch National Forest has been designated by the Forest Service as an experimental field for fish-cultural work. Further recognition of the biological character of the work of the bureau's Salt Lake City staff is evidenced by the invitation extended to the bureau's district supervisor by the University of Utah to establish his office headquarters on space allotted by the university.

The staff of regional investigators and fish-culturists devoted some time during the year to a study of fish diseases and feeding experiments, principally at the Springville station. At Bear Lake, Utah, a tract of land has been donated for use as an auxiliary trout-rearing station and plans for its development were being considered at the close of the year. A similar auxiliary on a smaller scale has been installed for Teton National Park, and a survey has been made of a tract of Government-owned land known as Powell Slough, which has been made available for bass and other pond fish rearing operations. Certain difficulties as to title have delayed the inception of actual construction on this site. The greater part of the activities outside of routine fish-cultural operations at the older hatcheries has been developed within the past two years, since regional headquarters were instituted at Salt Lake City. The wisdom of establishing this new administrative unit has been well demonstrated by the advances made and the interest displayed by State fish and game authorities and sportsmen generally throughout the intermountain region.

## GAME FISH PROPAGATION IN NEW ENGLAND

The work of the hatcheries in New England is confined mainly to the propagation of trout, though at several of them a few pond fish are produced. As a whole the year's operations at this group were quite successful. The Hartsville (Mass.) station increased its formerly inadequate water supply by digging wells and installing a pump. In addition to fish-cultural work on the usual scale, conditions at the Nashua (N. H.) station were improved by the construction of 1,500 feet of new fencing. In cooperation with the Connecticut fisheries authorities, this station also secured 120,000 smallmouth bass fry in certain reservoirs in that State where fishing is prohibited and utilized them in stocking other waters. This collection was greatly in excess of any that has been available for New England waters in recent years.

Activities in general at the Pittsford (Vt.) experimental hatchery were continued along formerly established lines. Feeding experiments and selective breeding experiments, carried on under the direction of the division of scientific inquiry, constituted the basic activity, and as a result of such work brook trout eggs and fingerlings in considerable quantity were made available for distribution and for transfer to other stations. A noteworthy item was the taking and hatching of eggs from Montana grayling which had been reared from the egg stage at the Pittsford station. In view of the difficulty heretofore experienced in handling grayling, this is considered to be a notable achievement in fish culture. It is also pertinent to point out that as a result of selective breeding, the average number of eggs per fish taken from selected brook trout breeders has been increased from 958 to 1,606 within a period of three years. A virtual reconstruction of the Pittsford hatchery building became necessary during the year, in order to prevent serious depreciation, and the general improvements included the extension of the pond rearing system.

The two largest establishments in the New England area are the one at East Orland, Me., and the St. Johnsbury (Vt.) station, with its important auxiliary at York Pond, N. H. At the last-named point the development work in progress under a special appropriation is nearing completion. The more important constructions include a new cement block hatchery and a stable and garage building. The water-supply system was also improved and additional rearing facilities installed. At this substation, which is the main producing unit for brook trout eggs to meet the bureau's requirements throughout the country, the egg collections exceeded those of any previous year. The former practice of securing the eggs from wild fish taken in closed streams within the national forest areas has been abandoned and dependence is now placed on domesticated stock maintained under seminatural conditions. At the St. Johnsbury station routine fish-cultural work was prosecuted with average results.

In addition to its work with the Atlantic salmon, a discussion of which appears elsewhere, the station at East Orland, Me., collected nearly 3,750,000 brook trout eggs, shipped over 2,000,000 in the eyed stage to other stations, and produced and distributed a large output of fingerling trout. A constant effort is being made to expand the facilities of the station and improve the property, and the various minor changes made during the year were effected with that aim in mind. Under the supervision of the East Orland station the auxili-

ary at Grand Lake Stream, Me., concentrated, as heretofore, on the collection of landlocked salmon eggs. Almost a million were taken, slightly below the record of the previous year. A considerable number of the fish resulting from these eggs are held in rearing ponds, for distribution as fingerlings 2 inches or more in length. In addition to work with the landlocked salmon, a considerable number of brook trout and a few Atlantic salmon were handled at this point.

### GAME FISH PROPAGATION AT COMBINATION TROUT AND POND FISH STATIONS

Located in the Middle West and southeastern sections of the country, where water conditions favor the existence of both cold and warm water fishes, are the several stations devoted to the culture of both trout and the pond fishes. The propagation of trout is the more important feature, however, at most of these establishments.

At the Wytheville (Va.) station, one of the oldest in the service, a very important feature of the year's work was the development of auxiliary rearing plants on leased property and the transfer of fish thereto from the main hatchery for rearing. At two of these, one within 3 miles of the station and the other at Newcastle, Va., facilities for such work were improved by the erection of necessary buildings and the provision of additional pond space. The White Sulphur Springs (W. Va.) station handled over 5,000,000 trout eggs during the year, which, in view of its comparatively limited size, is considered an excellent record. The same cooperative relations that have existed in the past were maintained with the State of West Virginia. Under this arrangement the State purchased 1,000,000 brook trout eggs which were incubated at the bureau's hatchery and the resulting fry were turned over to be handled by the State. The propagation of warm water pond fish at this station, including bass, bream, and a limited number of rock bass, gave somewhat more successful results than in previous years. Considerable attention was given to maintaining the appearance of buildings and grounds, since this hatchery is located at a point where it is subject to inspection by numerous visitors.

Work at the Erwin (Tenn.) station was conducted along the usual lines, though rainbow trout propagation was curtailed somewhat by a reduced brood stock, as a result of unusual mortality and the culling of the older fish. A satisfactory output of both trout and pond fish was secured at Manchester, Iowa, with no striking deviations from hitherto established records. After prolonged and intensive effort this station has succeeded in eradicating furunculosis, a disease which has been taking a heavy toll of the rainbow brood stock. The Neosho (Mo.) station administers substations at Bourbon, Mo., Langdon, Kans., Tishomingo, Okla., and Natchitoches, La. The former is a cooperative establishment conducted for the sole purpose of securing rainbow trout eggs, while the three latter are pond-fish stations. In all respects the results at Neosho were equal to the records of previous years. While the work at Bourbon was interfered with by a water shortage, it was possible to exceed the egg collections of any previous year at this point to the extent of 300,000. The shortage of water was reflected in the incidence of parasitic affection. Reference to activities of substations propagating pond fish exclusively appears elsewhere.

## POND-FISH STATIONS

The output of stations in the Southern States engaged in the propagation of the so-called warm water pond fishes is devoted to the stocking of comparatively small bodies of water, many of them ranging down to a half acre in area. Since there is a multitude of such ponds in many sections of the country, the demand for bass, sunfish, crappie, etc., is extremely heavy and great difficulty is experienced by the bureau in keeping abreast of the work of filling applications for these species. A review of the year's operations makes evident the fact that the output was seriously affected by unusually severe weather conditions. Storms and unseasonably low temperatures resulted in the loss of numerous nests of eggs during early March and retarded spawning over the entire territory covered by the pond-fish hatcheries. Notwithstanding this handicap, the results obtained from later spawning were very satisfactory. The Tupelo (Miss.) station has continued to operate on a highly successful scale and during the past year it produced and distributed, in seven different States, close to 900,000 bass and sunfish. The recently established Dexter (N. Mex.) station has already proved of inestimable value in supplying bass to a territory which has in the past been difficult and expensive to reach. With an available total of only about 2,000 brood fish of all species the station produced and distributed well over 50,000 young bass, and at the close of June the ponds still contained many fingerling bass, in addition to large numbers of crappie, catfish, warmouth bass, and bream.

The Warm Spring (Ga.) station established a new high record, its output of fish for the year exceeding 1,000,000, over half of which were bass fingerlings. The prolonged period of extremely dry weather prevailing in the Valdosta (Ga.) field reduced the station water supply to a point where only a negligible production of fish was possible. This difficulty will continue to handicap the Valdosta work until funds for completing the station in accordance with the original plans are made available, these plans including the provision of an adequate water supply, obtainable in the immediate vicinity. In addition to its work with the anadromous species, which is discussed elsewhere, the Edenton (N. C.) station propagated and distributed almost 500,000 fingerling bass. This record was made possible largely by giving increased attention to the fertilization of the limited pond area available for the work. At the Louisville (Ky.) station, where the principal activity is the propagation of smallmouth black bass, various conditions, including unfavorable weather and an inadequate supply of brood fish, curtailed the year's output to a point considerably below the normal annual production in that field. Although this station also has a very limited pond area, experience has shown that it will be necessary in the future to rear its own brood stock in preference to depending upon collections obtained from outside sources.

The Mammoth Spring (Ark.) station, which concentrates on the propagation of both largemouth and smallmouth bass, reported the most successful output of both species produced in this field in recent years. The superintendent continued to cooperate with the Arkansas State authorities, and by the reciprocal filling of requests for fish it has been possible to avoid an accumulation of unfilled applications. The Orangeburg (S. C.) station has been working on an enlargement

and development plan, authorized under the terms of the 5-year building program. This has included the construction of a concrete-lined ditch over 1,500 feet long for the diversion of surface water, and the construction of an additional pond approximating three-fourths of an acre in area. It is noteworthy that this pond yielded in excess of 100,000 bass fry and fingerlings during the spring of 1932, and several schools containing more than 8,000 fingerlings were taken. Enlargement and improvement of the station pond system is to be continued. In addition to the propagation of shad, which was carried on in conjunction with the State of South Carolina, the Orangeburg station experimented in the use of abandoned rice fields for the rearing of bass fry. Though many difficulties were encountered in this undertaking, the results of the season's efforts were fairly satisfactory.

Average success was attained in the fish-cultural work at the San Marcos (Tex.) station and its auxiliaries at Fort Worth and New Braunfels, Tex. The brood bream on hand were attacked by a sudden epidemic, however, and all of them died within a space of 48 hours. Attempts made to renew the brood stock by the introduction of fish from other points also resulted in a total mortality. The nature and cause of this epidemic have not as yet been ascertained. A large pond, constructed by erecting a dam in a slough of the San Marcos River, has not been a success, due to the fact that backwater conditions produced stagnation, resulting in the loss of some of the brood fish. In addition to its fish-cultural work the Fort Worth substation is being used by the division of scientific inquiry as a base for the experimental culture of mussels. A number of tanks for the development of daphnia were installed there during the year. The new substation at Natchitoches, La., had been practically completed by the close of the year and efforts were being made to collect an adequate brood stock. At Tishomingo, Okla., gradually increased production has been achieved from the improvements carried on at this comparatively new station during the past year. The Fairport (Iowa) biological station, the center of investigation of pond fish cultural methods, yielded a considerable number of fish, amounting to four carloads. The majority of these were bass.

## RESCUE OPERATIONS AND UPPER MISSISSIPPI WILD LIFE REFUGE

Administration of the Upper Mississippi Wild Life Refuge and the bureau's Mississippi River salvage operations overlap, since a considerable proportion of the area covered by the river crews falls within the boundaries of the refuge. The bureau's work in that territory is centered at La Crosse, Wis., and field operations are carried on during the rescue season from Homer, Minn., and several other points. Due to a protracted water shortage, resulting from a continuation of the drought of the previous year, there was a sharp drop in the season's collections, the total of the 16 or more species handled amounting to 51,611,367, representing less than half the results of an average season. All of these fish were returned to parental waters with the exception of 191,460, which were utilized in the general distribution work. The greater part of the collections were made in fields contiguous to the Homer substation. The cost of the season's work amounted to 27$\frac{7}{10}$ cents per thousand fish handled.

The rescue work is supplemented by the propagation of fish in semicontrolled ponds adjacent to some of the substations, and a large rearing pond adjoining the La Crosse station is also utilized. Three ponds over which full control is exercised by the bureau are now in use and there are six others within the boundaries of the refuge which may be operated in favorable seasons under the same conditions as ordinary hatchery ponds. In addition to its other activities the La Crosse station does an important work in trout propagation. It is the chief source for trout for stocking waters in Minnesota and Wisconsin, and during the fiscal year 1932 it produced nearly a million brook, rainbow, and Loch Leven trout for distribution in those States, a considerable proportion being assigned for cooperative nursery work. These cooperative establishments, numbering 42 in Wisconsin and 12 in Minnesota, required a considerable amount of attention from the La Crosse personnel in their supervision and guidance. An effort is being made to extend this cooperative work to include the rearing of bass and other warm-water fishes.

With regard to operations pertaining strictly to the Upper Mississippi Wild Life and Fish Refuge, the first half of the fiscal year, comprising the summer and fall of 1931, covered the final activities of the division of scientific inquiry in making biological investigations in that area. The principal accomplishments were (1) continuation of a scientific investigation of slough bottoms, (2) the chemical control of weeds, (3) seminatural propagation of fish in selected slough areas. After an inspection in the fall of 1931 it was decided that this particular phase of the work had reached its maximum usefulness, and that main attention thereafter should be given to propagation activities. During a high stage of the river in the spring of 1932 many of the sloughs which had been the scene of previous experiments were flooded, illustrating the wisdom of discontinuing that phase of the work. The funds made available by this change were utilized for the development of rearing ponds in many favorable places, and by such means additional pond space to the extent of over 30 acres was made available for the work. Even in these comparatively high elevations the operations were hampered by high-water stages during the spring.

## FISH-CULTURAL NOTES

### POND-CLEANING PUMPS

The division of fish culture is conducting experiments for the purpose of developing a satisfactory pond-cleaning pump for the removal by suction of loose débris and filth from trout ponds and raceways. There are on the market a number of so-called trash pumps and portable, gasoline-operated, centrifugal pumps which are designed to pass solid material of fairly large dimensions. Fish-cultural agencies have for a number of years been giving thought to equipment of this kind, really applying the vacuum-cleaner principle in water. While the equipment tried out by the bureau thus far has not been fully satisfactory, the results of the experiments have been sufficiently encouraging to warrant further study of the problem in cooperation with pump manufacturers.

### SPECIAL DISTRIBUTION TRUCKS

For over a year the bureau has operated several units of the special type of oxygen tank distribution trucks. These are now manufactured and sold as complete units, and are used by a number of the States and by various private fish culturists. The bureau's experience with such equipment, on the Pacific coast and elsewhere, leads to the conclusion that under certain conditions it will meet distribution requirements and render efficient service.

### EFFECT OF WEATHER ON SOUTHERN POND STATIONS

During the early part of March a period of exceedingly severe weather was experienced over the greater part of the United States. The effect of these storms and unseasonably low temperatures was reflected in the reports from the bureau's southern pond stations, the majority of them recording the loss of all bass spawn which had been deposited. It is especially noteworthy that stations located at widely separated points were subjected to the same weather conditions.

### REARING OF GRAYLING

The Pittsford (Vt.) experimental station is now rearing a second generation of domesticated grayling. Heretofore it has been the commonly accepted opinion among fish culturists that it was not practicable or hardly possible to rear grayling even to the fingerling stage. However, the lot of fish referred to was successfully brought to maturity under artificial conditions at the Pittsford station, and eggs in considerable numbers were taken from them and hatched. The resulting fry are now being reared with the same measure of success that attended the hatching of the parent fish.

### ERADICATION OF FURUNCULOSIS

When a trout hatchery has become infected with the furunculosis disease it has been the practice in too many cases to accept the difficulty as one which can not be surmounted, and to trust to luck that it will either die out naturally or that its ravages will prove sporadic. Recent experience at two of the bureau's stations has shown that it is quite practicable by the adoption of rigorous measures to eliminate all traces of the disease. Several years ago at the Barneveld (N. Y.) substation and during the past year at the Manchester (Iowa) station a program of pond disinfection and other measures appears to have eliminated the infection as an active factor in fish-cultural work. The experience at these stations indicates the necessity for the adoption of heroic treatment, accompanied by a willingness to sacrifice infected fish, equipment, and material. In other words, the entire plant must undergo a complete overhauling from the water supply source throughout the entire system of ponds, troughs, and other equipment used.

### NEW FORM OF POND CONSTRUCTION

Circular trout ponds of a new type are being constructed in connection with the development of several of the new stations, and as circumstances and funds permit ponds of the same design will be installed at the bureau's older stations. All reports received on this

form of construction from States and other agencies who have tested it indicate that it has a high value, and the limited experience the bureau has had with it confirms this viewpoint. The new ponds are merely saucer-shaped pools with the outlet at the center and the water supply entering at a tangent, to give a rotary circulation. It is claimed that ponds of this design are capable of carrying increased numbers of trout in a comparatively small water supply and that the fish in them are more evenly distributed than in ponds of the older types.

### TAGGING OF BASS

While the tagging of trout has been practiced quite extensively by some of the States, by private clubs, and by the bureau, operations of this nature with bass have been rather rare. Recent conditions at the Cape Vincent (N. Y.) station have afforded an unusual opportunity for such work with the smallmouth bass. Brood bass for the ponds at that station are obtained from the St. Lawrence River, under a permit issued by the State of New York. In accordance with the terms of this permit the fish are returned to the river after spawning is over, and prior to their release they are tagged with gill cover tags, with the view of checking up on their recapture by anglers. The information gained as a result of two years' tagging operations indicates that there is very little migration on the part of smallmouth bass, the maximum distance covered being from 12 to 15 miles.

### USE OF NICKEL MESH FOR HATCHING MARINE EGGS

A very satisfactory report has been received from the Woods Hole (Mass.) station on the use of nickel hardware cloth as a covering for the bottoms of trays used in the tidal hatching boxes. This material shows a high resistance to salt-water corrosion, no evidence of deterioration being discernible after a full season's use, though the metal tacks used in attaching it were seriously corroded. The substitution of nickel fastenings should overcome this difficulty.

Several advantages are cited for the use of this nickel mesh in preference to scrim or one of the other cotton fabrics commonly employed in marine hatcheries. It evidently has a life of several years, thus eliminating frequent replacement of the tray covering, whereas the best quality of scrim covering must be renewed every 10 or 12 days during a hatching season. Freedom from the necessity of removing and driving tacks in recovering saves the edges of the trays and extends their period of service. Nickel hardware cloth of the same mesh as scrim will remain open to the free circulation of water for many hours after cotton fabric has lost its permeability. It is stated that in collecting cod eggs from the overflow of the spawning cistern the use of scrim has necessitated a change of trays every 2 or 3 hours to overcome clogging, whereas trays covered with the nickel mesh function satisfactorily through 8 to 10 hour periods without attention. The higher first cost of the metal is its chief disadvantage, but it is probable that on a long-time basis its use would result in an appreciable saving.

### THE AQUARIUM

The new aquarium, located directly under the main lobby of the Department of Commerce Building, was completed late in February and on March 1 steps were taken for the removal of the aquarium stock from the old Bureau of Fisheries building to the new quarters. The move, completed within a week, involved the transfer of about 250 fish of 20 species, together with all aquarium accessories, equipment, and supplies. A supplementary collection, which had been accumulated gradually and held in Chicago at the John G. Shedd and Lincoln Park aquariums, was brought to Washington on March 16 by means of United States Fisheries car No. 7. This collection comprised 255 specimens of 24 species, in addition to a number of trout which had been transported by the car from the Montana station and other stations en route. When fully stocked the aquarium constituted a splendid display of the fresh-water fishes native to this country. Five small aquaria, maintained under balanced conditions, were stocked with the popular tropical aquarium fishes, making a most interesting exhibit and demonstrating the possibilities of handling fish with artificial light only. With the installation of a background of local rock and aquatic plants, many of the aquaria provide a good representation of the native habitat of the fishes shown. The aquarium is equipped with 3 tanks of 2,000 gallons capacity, 20 holding 1,000 gallons, and 24 of 50 gallons capacity. There are now on display approximately 550 specimens, representing 46 varieties of food, game, and predacious fishes, in addition to turtles, frogs, and several odd brackish water types. Six large and six small aquaria are on a small refrigerating system which is used during warm weather to provide cold water for the trouts. A water storage capacity of 1,500 gallons is available and is frequently used in the holding of fish destined for distribution.

## Part 2.—DISTRIBUTION OF FISH AND FISH EGGS

[E. C. Fearnow, Superintendent of Distribution]

Notwithstanding the limited output at the rescue stations along the Mississippi River, the bureau was able to fill practically all of its applications for the so-called warm-water fishes in the Middlewestern States from its pond stations at Langdon, Kans., Fairport, Iowa, and Miles City, Mont. The total output of the three stations aggregated 21 large carload shipments.

In distributing the bureau's annual output of fish, its distribution cars traveled a total of 110,996 miles of which 11,479 were free. Detached messengers traveled 364,044 miles of which 68,261 were free. Automobile trucks in making deliveries of fish traveled 64,965 miles.

The following table summarizes the distribution of fish and fish eggs during the fiscal year to applicants in the United States and its Territories. It also shows the plants of fish made by the bureau in public waters of the country in connection with the propagation of commercial fishes, and the salvage of fish from temporarily flooded lands.

*Summary, by species, of the distribution of fish, 1932*

| State and species | Number |
|---|---|
| Alabama: | |
| Catfish | 1,350 |
| Rainbow trout | 1,500 |
| Largemouth black bass | 375,920 |
| Sunfish | 203,190 |
| Alaska: | |
| Sockeye salmon | 19,920,512 |
| Humpback salmon | 317,000 |
| Brook trout | 77,050 |
| Arizona: | |
| Rainbow trout | 25,000 |
| Loch Leven trout | 200,000 |
| Brook trout | 25,000 |
| Largemouth black bass | 225 |
| Sunfish | 100 |
| Yellow perch | 225 |
| Arkansas: | |
| Catfish | 150 |
| Rainbow trout | 23,680 |
| Crappie | 2,700 |
| Largemouth black bass | 101,330 |
| Smallmouth black bass | 112,500 |
| Rock bass | 25,300 |
| Sunfish | 7,900 |
| California: | |
| Chinook salmon | 19,662,300 |
| Atlantic salmon | 25,000 |
| Colorado: | |
| Steelhead salmon | 150,000 |
| Rainbow trout | 892,310 |
| Black-spotted trout | 660,700 |
| Loch Leven trout | 224,890 |
| Lake trout | 100,000 |
| Brook trout | 2,728,490 |
| Largemouth black bass | 4,450 |
| Crappie | 5,375 |
| Sunfish | 53,500 |
| Yellow perch | 2,875 |
| Connecticut: | |
| Catfish | 500 |
| Rainbow trout | 2,850 |
| Brook trout | 20,950 |
| Smallmouth black bass | 24,000 |
| Yellow perch | 36 |
| Delaware: | |
| Crappie | 450 |
| Largemouth black bass | 1,650 |
| Sunfish | 250 |
| Florida: | |
| Largemouth black bass | 140 |
| Georgia: | |
| Catfish | 2,040 |
| Rainbow trout | 230,000 |
| Brook trout | 23,500 |
| Largemouth black bass | 364,580 |
| Warmouth bass | 270 |
| Sunfish | 231,965 |
| Idaho: | |
| Catfish | 375 |
| Chinook salmon | 2,528,500 |
| Rainbow trout | 1,518,000 |
| Black-spotted trout | 2,465,000 |
| Largemouth black bass | 4,300 |
| Illinois: | |
| Silver salmon | 200,000 |
| Rainbow trout | 2,700 |
| Loch Leven trout | 2,500 |
| Crappie | 1,875 |
| Largemouth black bass | 13,895 |
| Sunfish | 1,100 |
| Yellow perch | 140 |
| Indiana: | |
| Catfish | 8,670 |
| Rainbow trout | 12,450 |
| Loch Leven trout | 39,600 |
| Brook trout | 58,100 |
| Crappie | 4,190 |
| Largemouth black bass | 32,890 |
| Smallmouth black bass | 23,600 |
| Sunfish | 48,165 |
| Yellow perch | 2,295 |
| Pike perch | 1,500,000 |
| Iowa: | |
| Catfish | 4,408,200 |
| Buffalofish | 255,680,300 |
| Carp | 239,000,000 |
| Rainbow trout | 172,105 |
| Brook trout | 1,200 |
| Pike and pickerel | 66,260 |
| Crappie | 1,318,400 |
| Largemouth black bass | 24,447 |
| Sunfish | 1,320,200 |
| Yellow perch | 9,010 |
| White bass | 12,935 |
| Fresh-water drum | 120 |
| Miscellaneous fishes | 512,000 |
| Kansas: | |
| Catfish | 5,200 |
| Rainbow trout | 22,268 |
| Crappie | 12,880 |
| Largemouth black bass | 10,215 |
| Sunfish | 7,375 |
| Yellow perch | 600 |
| Kentucky: | |
| Rainbow trout | 5,350 |
| Crappie | 500 |
| Largemouth black bass | 71,040 |
| Smallmouth black bass | 65,672 |
| Rock bass | 300 |
| Sunfish | 6,850 |
| Louisiana: | |
| Catfish | 75 |
| Crappie | 250 |
| Largemouth black bass | 845 |
| Sunfish | 16,160 |
| Maine: | |
| Atlantic salmon | 1,088,450 |
| Landlocked salmon | 943,800 |
| Lake trout | 300,000 |
| Brook trout | 988,000 |
| Smallmouth black bass | 16,100 |
| Cod | 915,741,000 |
| Winter flounder | 2,243,417,000 |
| Maryland: | |
| Rainbow trout | 108,370 |
| Brook trout | 40,550 |
| Largemouth black bass | 52,750 |
| Smallmouth black bass | 4,895 |
| Sunfish | 7,760 |
| Massachusetts: | |
| Catfish | 6,710 |
| Rainbow trout | 55,100 |
| Loch Leven trout | 100,000 |
| Brook trout | 234,420 |
| Mackerel | 15,245,000 |
| Smallmouth black bass | 50,000 |
| Pike perch | 510,000 |
| Yellow perch | 456 |
| White perch | 325 |
| Cod | 713,025,000 |
| Haddock | 800,151,000 |
| Pollock | 14,670,000 |
| Winter flounder | 815,707,000 |
| Michigan: | |
| Whitefish | 8,470,000 |
| Steelhead salmon | 74,000 |
| Landlocked salmon | 25,000 |
| Rainbow trout | 21,800 |
| Loch Leven trout | 47,200 |
| Lake trout | 24,960,750 |
| Brook trout | 1,205,000 |
| Crappie | 500 |
| Largemouth black bass | 6,940 |
| Smallmouth black bass | 7,800 |
| Sunfish | 11,450 |
| Pike perch | 36,800,000 |
| Yellow perch | 950 |
| Minnesota: | |
| Catfish | 3,313,900 |
| Buffalofish [1] | 24,655 |
| Carp [1] | 3,423,100 |
| Rainbow trout | 52,475 |
| Loch Leven trout | 19,800 |
| Lake trout | 312,750 |

[1] Rescued fishes planted in Mississippi River.

*Summary, by species, of the distribution of fish, 1932*—Continued

| State and species | Number |
|---|---|
| Minnesota—Continued. | |
| Brook trout | 154,860 |
| Pike and pickerel | 11,770 |
| Crappie | 3,960,200 |
| Largemouth black bass | 143,815 |
| Smallmouth black bass | 400 |
| Sunfish | 4,374,000 |
| Pike perch | 15,960,000 |
| Yellow perch | 210,180 |
| White bass | 1,805 |
| Fresh-water drum | 525,375 |
| Miscellaneous fishes | 3,160,570 |
| Mississippi: | |
| Largemouth black bass | 311,770 |
| Smallmouth black bass | 125 |
| Sunfish | 261,925 |
| Missouri: | |
| Catfish | 1,500 |
| Rainbow trout | 251,388 |
| Crappie | 23,125 |
| Largemouth black bass | 82,091 |
| Smallmouth black bass | 5,825 |
| Rock bass | 1,000 |
| Sunfish | 31,930 |
| Montana: | |
| Catfish | 7,325 |
| Whitefish | 5,000,000 |
| Silver salmon | 500,400 |
| Landlocked salmon | 13,000 |
| Rainbow trout | 3,016,427 |
| Golden trout | 5,690 |
| Black-spotted trout | 3,080,000 |
| Loch Leven trout | 10,914,200 |
| Brook trout | 374,100 |
| Crappie | 29,775 |
| Largemouth black bass | 3,000 |
| Sunfish | 448,650 |
| Yellow perch | 45,005 |
| Miscellaneous fishes | 15,000 |
| Nebraska: | |
| Catfish | 22,560 |
| Largemouth black bass | 15,560 |
| Rainbow trout | 117,860 |
| Loch Leven trout | 128,900 |
| Brook trout | 126,400 |
| Sunfish | 9,500 |
| Yellow perch | 10,825 |
| Nevada: | |
| Rainbow trout | 525,000 |
| Black-spotted trout | 1,347,200 |
| New Hampshire: | |
| Catfish | 300 |
| Landlocked salmon | 7,800 |
| Rainbow trout | 17,200 |
| Lake trout | 4,000 |
| Brook trout | 347,090 |
| Smallmouth black bass | 12,400 |
| New Jersey: | |
| Loch Leven trout | 1,500 |
| Brook trout | 8,000 |
| Crappie | 750 |
| Largemouth black bass | 6,819 |
| Smallmouth black bass | 1,000 |
| Sunfish | 7,800 |
| Yellow perch | 275 |
| New Mexico: | |
| Catfish | 8,000 |
| Chinook salmon | 200,000 |
| Rainbow trout | 1,494,000 |
| Black-spotted trout | 75,000 |
| Brook trout | 105,900 |
| Crappie | 600 |
| Largemouth black bass | 71,740 |
| Sunfish | 10,600 |
| Yellow perch | 1,350 |
| New York: | |
| Catfish | 290 |
| Cisco | 23,000,000 |
| Whitefish | 410,000 |
| Chinook salmon | 5,000 |
| Steelhead salmon | 35,000 |
| New York—Continued. | |
| Landlocked salmon | 275,000 |
| Rainbow trout | 46,500 |
| Loch Leven trout | 196,575 |
| Lake trout | 58,800 |
| Brook trout | 386,685 |
| Crappie | 1,710 |
| Largemouth black bass | 24,706 |
| Smallmouth black bass | 233,310 |
| Sunfish | 14,400 |
| Yellow perch | 2,134,763 |
| Pike perch | 960,000 |
| Winter flounder | 98,154,000 |
| North Carolina: | |
| Glut herring | 55,000,000 |
| Rainbow trout | 208,300 |
| Loch Leven trout | 102,100 |
| Brook trout | 129,900 |
| Crappie | 300 |
| Largemouth black bass | 281,505 |
| Rock bass | 1,800 |
| Sunfish | 21,446 |
| Yellow perch | 11,560,120 |
| White perch | 7,000,000 |
| Striped bass | 1,676,000 |
| North Dakota: | |
| Catfish | 125 |
| Crappie | 900 |
| Largemouth black bass | 900 |
| Sunfish | 2,240 |
| Ohio: | |
| Catfish | 3,120 |
| Whitefish | 61,000,000 |
| Chinook salmon | 1,000 |
| Silver salmon | 250,020 |
| Steelhead salmon | 50,000 |
| Rainbow trout | 3,400 |
| Loch Leven trout | 300 |
| Brook trout | 5,050 |
| Crappie | 4,300 |
| Largemouth black bass | 20,380 |
| Smallmouth black bass | 56,700 |
| Sunfish | 5,030 |
| Pike perch | 442,600,000 |
| Oklahoma: | |
| Catfish | 5,127 |
| Rainbow trout | 15,966 |
| Crappie | 27,595 |
| Largemouth black bass | 40,347 |
| Sunfish | 74,645 |
| Yellow perch | 375 |
| Oregon: | |
| Chinook salmon | 4,054,870 |
| Chum salmon | 22,000 |
| Silver salmon | 737,900 |
| Steelhead salmon | 750,000 |
| Loch Leven trout | 120,000 |
| Brook trout | 2,500 |
| Pennsylvania: | |
| Catfish | 31,411 |
| Common sucker | 17,275,000 |
| Rainbow trout | 299,637 |
| Loch Leven trout | 211,800 |
| Lake trout | 3,000 |
| Brook trout | 927,781 |
| Crappie | 14,476 |
| Largemouth black bass | 19,393 |
| Rock bass | 120 |
| Sunfish | 73,671 |
| Yellow perch | 5,461 |
| Pike perch | 43,494,000 |
| Rhode Island: Brook trout | 200 |
| South Carolina: | |
| Rainbow trout | 31,630 |
| Loch Leven trout | 6,600 |
| Brook trout | 22,850 |
| Largemouth black bass | 216,292 |
| Rock bass | 500 |
| Warmouth bass | 5,800 |
| Sunfish | 97,200 |

*Summary, by species, of the distribution of fish, 1932*—Continued

| State and species | Number |
|---|---|
| South Dakota: | |
| Catfish | 7,100 |
| Rainbow trout | 90,500 |
| Loch Leven trout | 417,150 |
| Brook trout | 454,050 |
| Largemouth black bass | 1,750 |
| Sunfish | 5,500 |
| Yellow perch | 12,075 |
| Tennessee: | |
| Catfish | 700 |
| Rainbow trout | 109,350 |
| Loch Leven trout | 68,500 |
| Brook trout | 121,150 |
| Crappie | 200 |
| Largemouth black bass | 110,305 |
| Smallmouth black bass | 2,000 |
| Rock bass | 4,000 |
| Sunfish | 41,306 |
| Texas: | |
| Catfish | 1,820 |
| Crappie | 17,055 |
| Largemouth black bass | 481,560 |
| Rock bass | 8,800 |
| Warmouth bass | 1,100 |
| Sunfish | 151,130 |
| Rio Grande perch | 22,900 |
| Yellow perch | 225 |
| Utah: | |
| Chinook salmon | 500,000 |
| Rainbow trout | 1,040,686 |
| Black-spotted trout | 730,975 |
| Loch Leven trout | 29,000 |
| Lake trout | 100,000 |
| Brook trout | 251,000 |
| Vermont: | |
| Steelhead salmon | 25,900 |
| Landlocked salmon | 34,541 |
| Atlantic salmon | 2,000 |
| Rainbow trout | 500 |
| Loch Leven trout | 70,000 |
| Lake trout | 103,000 |
| Brook trout | 1,089,089 |
| Grayling | 1,063 |
| Largemouth black bass | 330 |
| Smallmouth black bass | 5,000 |
| Pike perch | 28,510,000 |
| Yellow perch | 58,600,000 |
| Virginia: | |
| Catfish | 950 |
| Shad | 29,757,600 |
| Rainbow trout | 131,243 |
| Loch Leven trout | 121,080 |
| Brook trout | 384,386 |
| Pike | 1,500 |
| Largemouth black bass | 232,725 |
| Smallmouth black bass | 15,994 |
| Rock bass | 11,900 |
| Virginia—Continued. | |
| Sunfish | 170,075 |
| Yellow perch | 112,492,000 |
| Washington: | |
| Chinook salmon | 22,354,600 |
| Chum salmon | 18,169,750 |
| Silver salmon | 5,375,500 |
| Sockeye salmon | 22,875,145 |
| Humpback salmon | 8,544,800 |
| Steelhead salmon | 1,385,000 |
| Rainbow trout | 84,900 |
| Black-spotted trout | 1,403,000 |
| Loch Leven trout | 266,600 |
| Brook trout | 37,870 |
| Dolly Varden trout | 2,462,000 |
| West Virginia: | |
| Catfish | 2,550 |
| Rainbow trout | 317,190 |
| Loch Leven trout | 14,800 |
| Brook trout | 1,066,780 |
| Crappie | 4,000 |
| Largemouth black bass | 34,108 |
| Smallmouth black bass | 44,325 |
| Rock bass | 5,100 |
| Sunfish | 31,520 |
| Wisconsin: | |
| Catfish | 4,321,980 |
| Buffalofish | 150,875 |
| Carp | 5,085,500 |
| Rainbow trout | 580,200 |
| Loch Leven trout | 275,900 |
| Brook trout | 1,201,000 |
| Pike and pickerel | 38,860 |
| Crappie | 1,736,840 |
| Largemouth black bass | 89,805 |
| Smallmouth black bass | 2,300 |
| Sunfish | 2,198,675 |
| Pike perch | 1,575,000 |
| Yellow perch | 52,140 |
| White bass | 1,025 |
| Fresh-water drum | 25 |
| Miscellaneous fishes | 372,225 |
| Wyoming: | |
| Catfish | 12,400 |
| Chinook salmon | 100,000 |
| Silver salmon | 65,280 |
| Rainbow trout | 1,990,000 |
| Golden trout | 50,400 |
| Black-spotted trout | 5,838,920 |
| Loch Leven trout | 1,900,600 |
| Lake trout | 100,000 |
| Brook trout | 1,222,410 |
| Grayling | 40,000 |
| Crappie | 9,450 |
| Largemouth black bass | 9,375 |
| Sunfish | 65,440 |
| Yellow perch | 7,945 |

## METHOD OF DISTRIBUTION

Blanks on which application for fish may be made are furnished to applicants on request. These blanks call for a complete description of waters to be stocked and from the information furnished the bureau determines the species that are suitable.

Upon receipt of the applications the applicants are notified in regard to the species that will be furnished and the approximate date of delivery and are given instructions for receiving and caring for the consignment. Before shipment is made a second notice is given, usually by telegram, stating the exact time the fish will arrive at the railroad station. Fish are delivered at the railroad stations of applicants free of charge.

Applicants are expected to provide suitable receptacles for carrying fish, such vessels to be in readiness at the railroad station specified in the advance notice of delivery. The vessels should be uncovered and empty.

The bureau experiences considerable difficulty in making deliveries of fish to points on branch lines where the train service is poor. It will facilitate delivery if the applicant will designate a railroad station on a line where there is good train service.

It frequently occurs that shipments of fish are forwarded a great distance and the messenger in charge must make deliveries to a number of applicants at different points. In order to facilitate deliveries, the messenger sometimes asks applicants to meet their fish at a point other than the one designated on the application.

In making allotments of fish the bureau takes into consideration the area of the water to be stocked, the size and number of fish available, and the distance the fish must be transported. The bureau distributes fish as fingerlings and yearlings. However, at some stations it is necessary to distribute a portion of the output as fry to prevent overcrowding.

Shipments of trout from the bureau's eastern stations are usually made during May and June and applications received after April 1 will be carried on file for attention during the following year. The distribution of trout in the Rocky Mountain regions is made from May to October and applications for that section should be submitted prior to May 1 in order to assure early delivery. Requests for bass, sunfish, and crappie should be made prior to May 1 as deliveries of such species are made between May and December.

Detailed information on the bureau's method of distribution is contained in Fisheries Circular No. 8 entitled "Stocking Interior Waters of the United States."

O