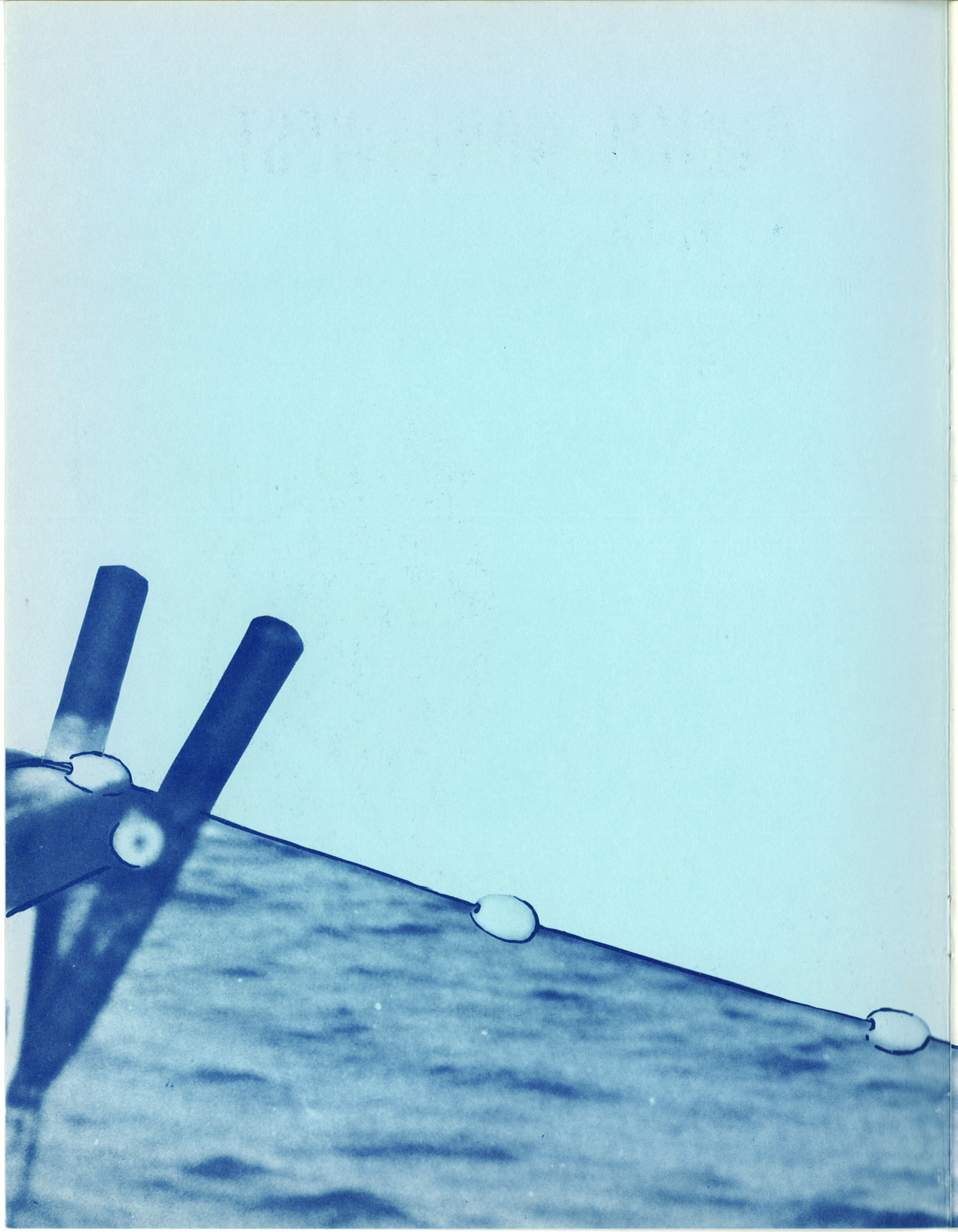
PACIFIC NORTHWEST REGION

BUREAU OF COMMERCIAL FISHERIES

CIRCULAR 207



UNITED STATES DEPARTMENT OF THE INTERIOR
Stewart L. Udall, *Secretary*
John A. Carver, *Under Secretary*
Stanley A. Cain, *Assistant Secretary for Fish and Wildlife*
FISH AND WILDLIFE SERVICE, Clarence F. Pautzke, *Commissioner*
BUREAU OF COMMERCIAL FISHERIES, Donald L. McKernan, *Director*

DESIGNED AND COMPILED
by Don Ingalls

THE PACIFIC NORTHWEST REGION OF THE BUREAU OF COMMERCIAL FISHERIES

SAMUEL J. HUTCHINSON
Regional Director
Seattle, Washington

WASHINGTON, D. C.
April, 1965
(Revision of Circular 108)

Let us begin . . .

"The seas offer a wealth of nutritional resources. They already are a principal source of protein. They can provide many times the current food supply if we learn how to garner and husband this self-renewing larder. To meet the vast needs of an expanding population, the bounty of the sea must be made more available. Within two decades, our own nation will require over a million more tons of sea-food than we now harvest."

JOHN F. KENNEDY
35th President of the United States

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ORGANIZATION CHART

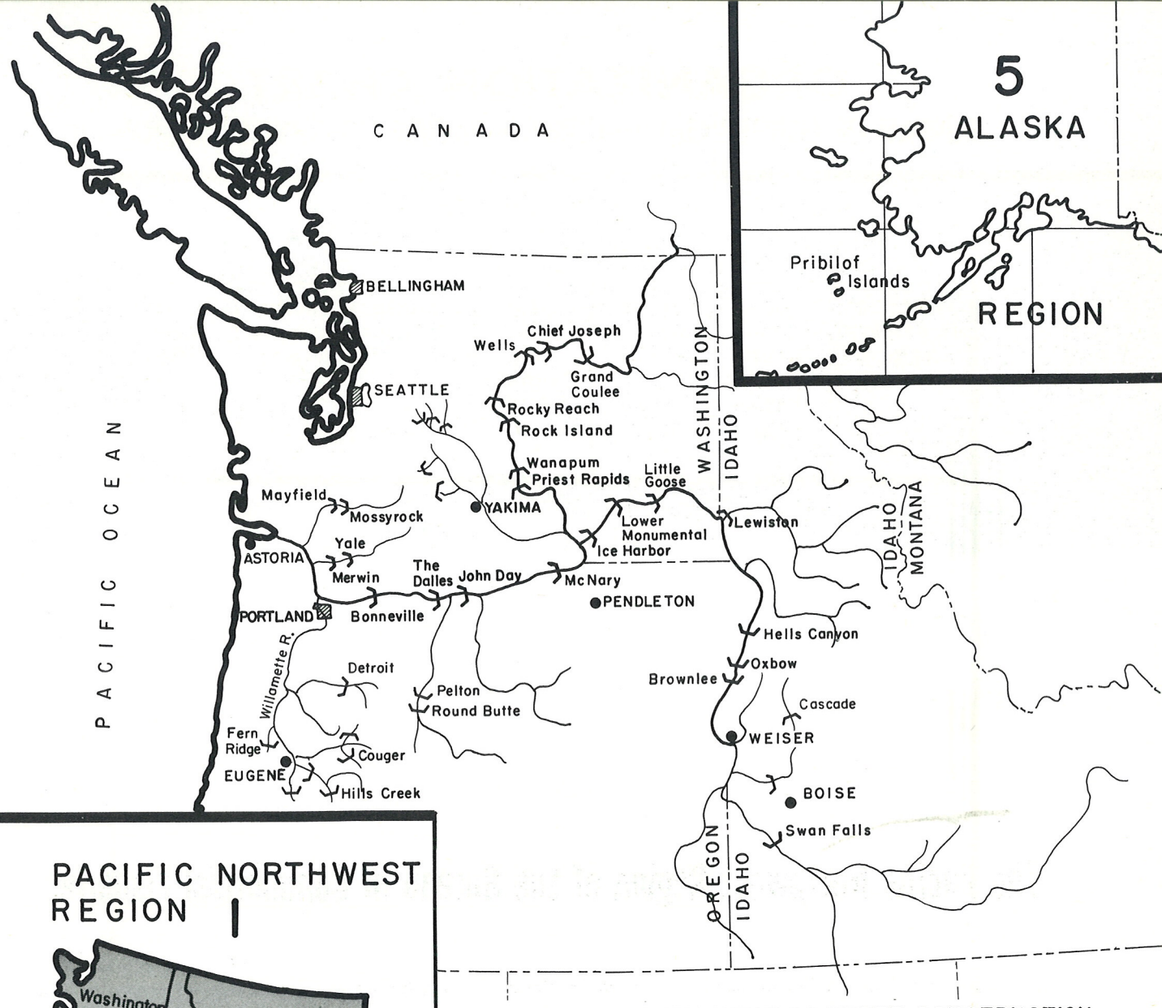
BUREAU OF COMMERCIAL FISHERIES • PACIFIC NORTHWEST REGION

DIRECTOR

Washington, D. C.

PACIFIC NORTHWEST REGION	Gulf and South Atlantic Region	North Atlantic Region	Great Lakes and Central Region	Alaska Region	Pacific Southwest Region	Hawaii Area Office
1	2	3	4	5	6	

- ADMINISTRATION
- BIOLOGICAL RESEARCH
- TECHNOLOGICAL RESEARCH
- FISH-PASSAGE RESEARCH
- EXPLORATORY FISHING AND GEAR RESEARCH
- MARINE MAMMAL RESEARCH AND MANAGEMENT
- COLUMBIA FISHERIES PROGRAM OFFICE
- MARKET NEWS AND STATISTICS
- MARKETING
- ENFORCEMENT
- LOANS AND GRANTS



PRINCIPAL DAMS BUILT OR UNDER CONSTRUCTION IN THE COLUMBIA RIVER BASIN.

PACIFIC NORTHWEST REGION 1

Seattle, Washington	PACIFIC NORTHWEST REGIONAL OFFICE (SEE PAGE 1)
North Bonneville, Washington	LABORATORY SUBSTATION
Astoria, Oregon	ENFORCEMENT OFFICE
Bellingham, Washington	ENFORCEMENT OFFICE
Portland, Oregon	COLUMBIA FISHERIES PROGRAM OFFICE
Eugene, Oregon	PROGRAM OFFICE FIELD STATION
Boise, Idaho	PROGRAM OFFICE FIELD STATION
Weiser, Idaho	FIELD OFFICE AND LABORATORY SUBSTATION
St Paul, Alaska	FUR SEAL PROGRAM FIELD OFFICE
St George, Alaska	FUR SEAL PROGRAM FIELD OFFICE

AREA OF THE PACIFIC NORTHWEST REGION AND PRINCIPAL OFFICES.

Seattle's metropolitan area fronts on a deep, protected harbor which provides superb anchorage for ships. The bulk of Seattle's fishing industry is located along the waterfront. (Courtesy Port of Seattle).

The Pacific Northwest Region of the Bureau of Commercial Fisheries

Puget Sound was a fishing center in the Pacific Northwest long before white men stepped ashore at Alki Point in West Seattle. Fish were the important food for the Indians living on the shores of this vast natural waterway. As the white settlement grew, fisheries became one of the prosperous industries. The methods of fishing were varied and included a combination of methods adopted from East Coast fishermen and the local Indians. Salting was the principal early technique used to preserve the fish. As time progressed, newer and larger boats with more efficient gear led to a greater harvest from the sea, and the preservation techniques were improved manyfold. The fishermen soon learned, however, that fishery stocks were not inexhaustible and felt the need for fishery research.

During the late 1920's, many foresighted men visualized the future importance of Seattle as a fishery center. One of these was the U. S. Commissioner of Fisheries, Henry O'Malley. He selected Seattle as the site for a Federal fishery research laboratory. Thus, Seattle became a center for fishery research and was the logical site for the office of the Pacific Northwest Region when the Bureau of Commercial Fisheries was established under the U. S. Fish and Wildlife Act of 1956.

The activities of the Bureau range from basic research on the populations of fish and the many factors influencing their abundance, to the finished product on the consumer's table. Between these extremes, the Bureau's work involves various types of problems in many fields of science and technology. The Bureau's program is financed from two major sources: (1) an annual appropriation by Congress and (2) Saltonstall-Kennedy funds, which represent a percentage of the duties paid on imported fishery products.

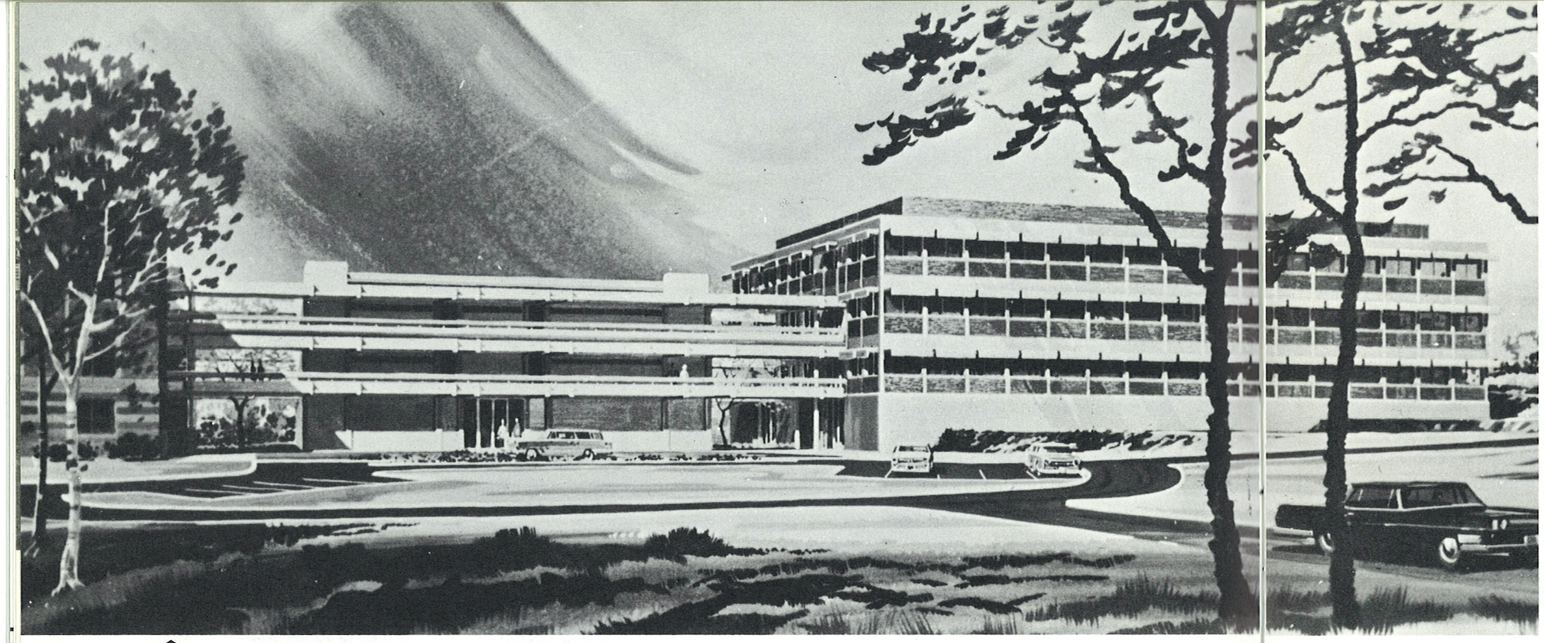
Many pressing fishery problems in the Pacific Northwest concern the Western States. Through persistent research by the fishery agencies of these States and the Bureau of Commercial Fisheries, such problems are being solved. Important to this effort is the supply of fishery scientists, educated in the colleges and universities throughout the world.

With Federal-State cooperation and with dedicated people in the employ of the various agencies, we are confident the great fish resources will always be productive and contribute to the economy and well-being of our Nation.

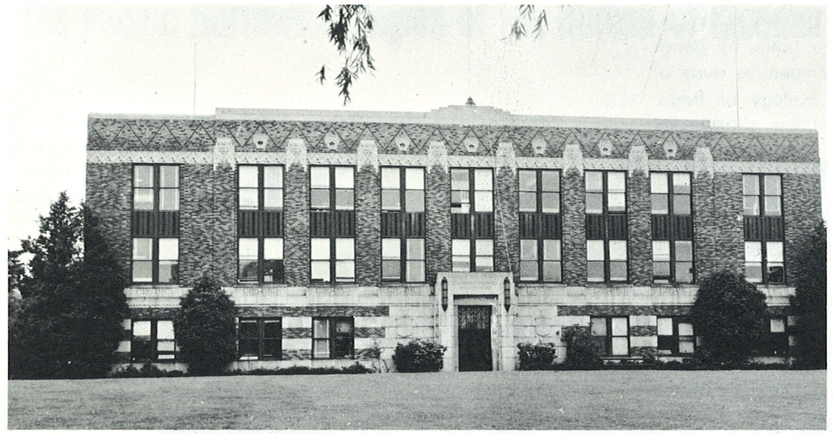
Food science and the study of food preservation: Examination of the condition of commercially-raised trout as part of our studies on preservation by freezing.

Fishery students at the University of Washington sampling shore fishes by beach seine as part of their intensive study of the life history and ecology of fishes.

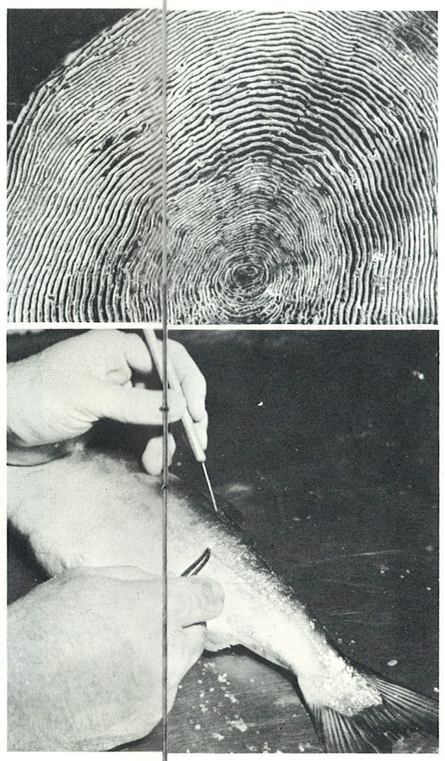
(Courtesy of Paul V. Thomas).



This new 65,000-square-foot laboratory addition was completed in December 1964. It and the original laboratory are the home of the Biological and Technological Laboratories, Exploratory Fishing and Gear Research Base, Marketing Office, and the Branch of Reports.



The original "Montlake Laboratory" is now an integral part of the Bureau's research complex. Built in 1931, it housed all the Bureau's research activities until recent years. This now historic building has been the scene of many international commission meetings, where decisions of importance to world fisheries have been made.

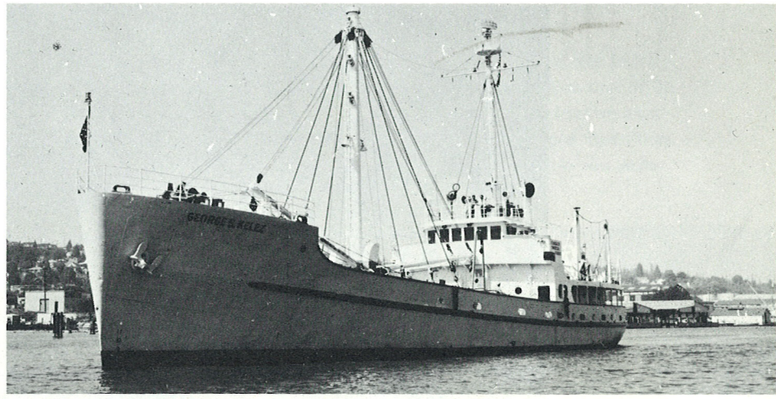


Scales are removed from salmon and magnified, and the growth rings studied to determine the age and origin of the individual fish.

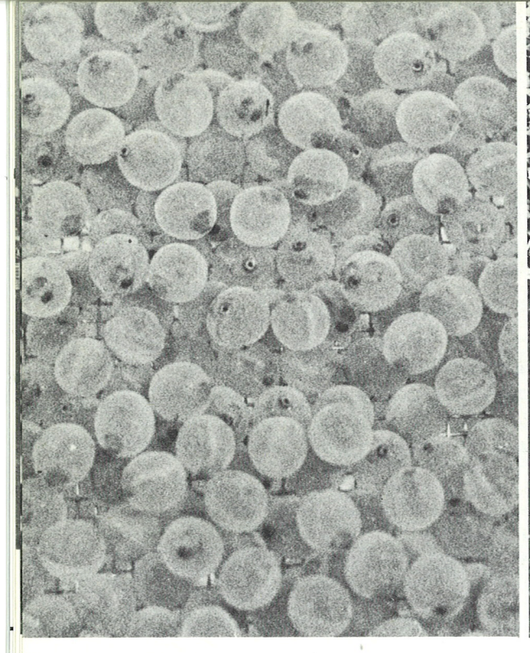
Biological Laboratory

The principal function of the Bureau's Biological Laboratory, Seattle, Wash., is to conduct research on the coastal and high seas fishes in the Pacific Northwest Region. Research on salmon behavior patterns and survival and the influences of environment provides an understanding of the fluctuations in abundance of coastal stocks. Considerable research is directed toward providing safe passage for migratory fishes at water-use projects, such as hydroelectric and flood-control dams, and irrigation systems.

In the critical international North Pacific fishery, unique research tools have been developed to distinguish Asiatic from North American stocks of salmon and determine their distribution.

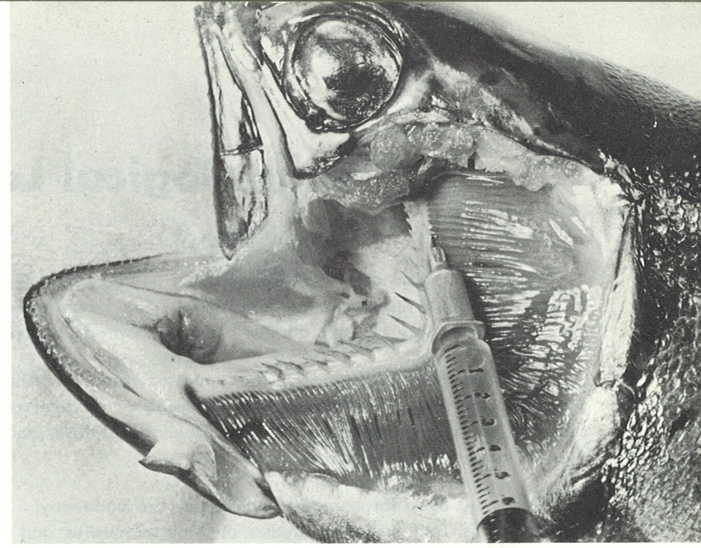


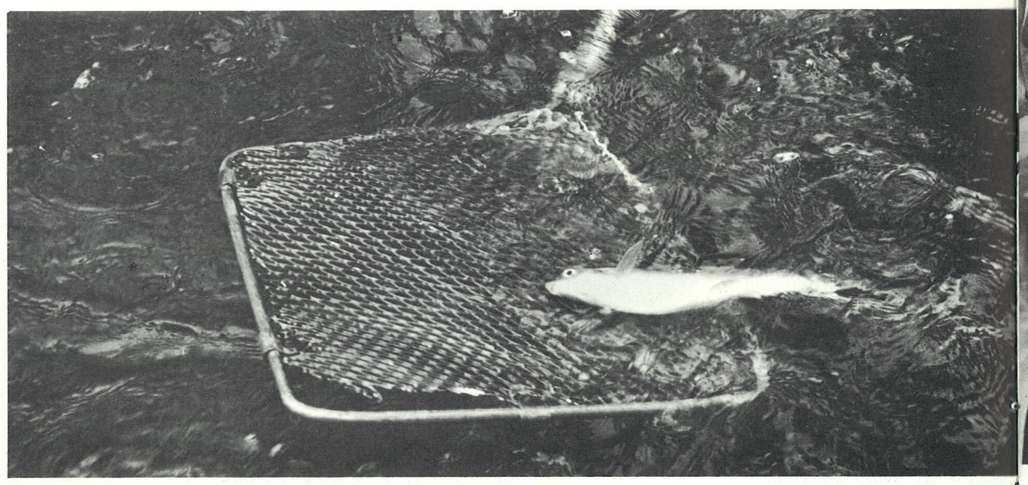
The **George B. Kelez,** a converted military vessel, is the Biological Laboratory's first high seas research vessel. She was commissioned in July 1962. This 176-foot vessel is engaged in salmon gill netting and longline fishing and oceanographic work.



Planting salmon eggs in gravel of a man-made stream where optimum conditions are provided for incubation.

Surgical and physiological techniques are often necessary in fishery research. On a dead fish from which the gill cover has been removed, the technique of direct injections into the blood stream is illustrated. Serological studies have provided valuable means of investigating genetic differences among fish populations, and serology has proven to be a sensitive method of detecting maturity.

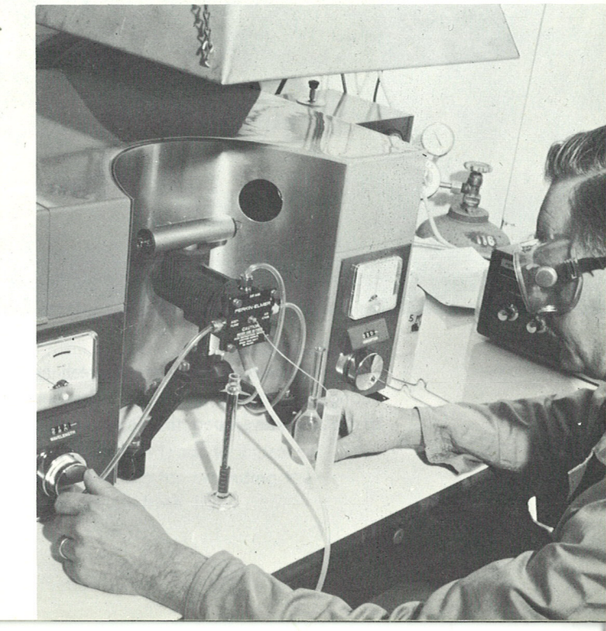




Fish attracted to anode of specialized electro-fishing gear that enables biologists to sample predatory stream fishes in salmon survival studies.

Salmon being tagged on the high seas to obtain information on growth rates, mortality, and migration during periods of ocean life — especially to measure the effects of high seas salmon fisheries.

The oceanographic program investigates the fertility and biological production of the ocean as one of its many facets of research. Here a chemist uses an atomic spectrophotometer to measure minute quantities of the dissolved nutrient metals present in sea water.

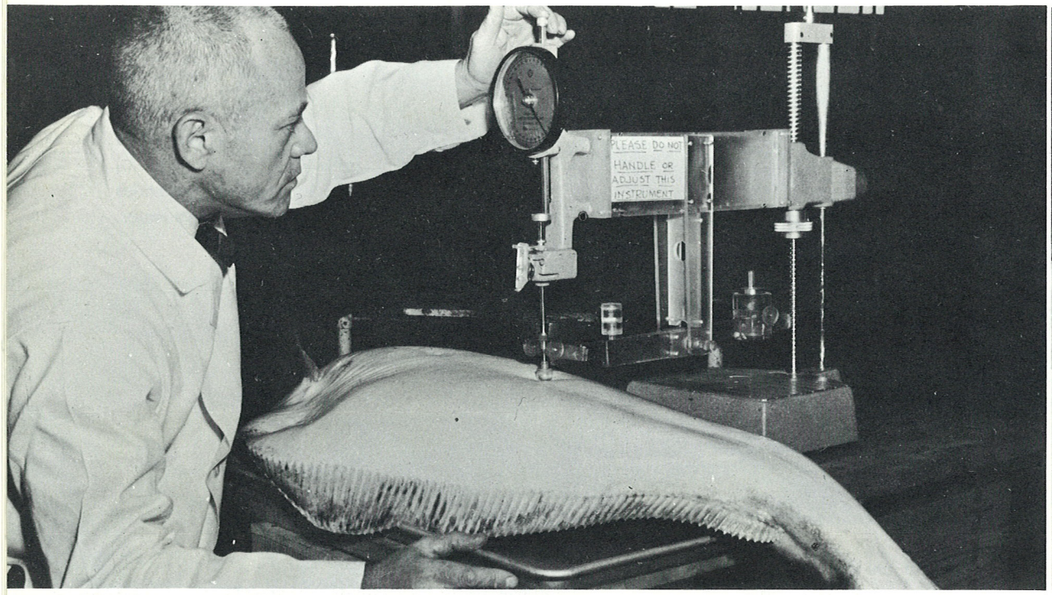


Technological Laboratory

The Bureau's Technological Laboratory in Seattle conducts research that will provide knowledge necessary to use our fishery resources more effectively. The laboratory maintains liaison with industry so that the commercial fisheries may be kept abreast of research progress and may obtain information on problem areas.

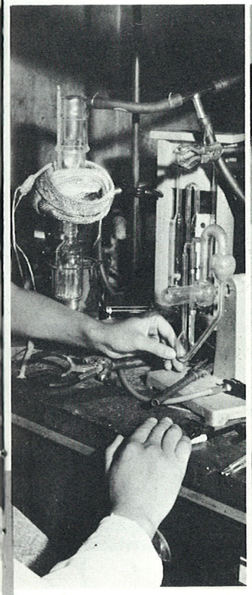
The laboratory has two principal units of research. The Chemical Research Unit is concerned largely with basic changes in the chemical, biochemical, or physical components of fish. The Preservation and Processing Research Unit deals with the microbiology of fresh and processed fish, and the physical and chemical changes occurring in the processing of fish.

Currently, three large research programs are underway. The first aims at improving and expanding the market for fish oils, including studies on their properties and chemical reactions, and on the preparation of new products from fish oils. The second involves irradiation pasteurization of several fish products as a means of extending their storage or shelf life. The third deals with developing standards for quality that will assure the customer of high-quality fresh and frozen fish.

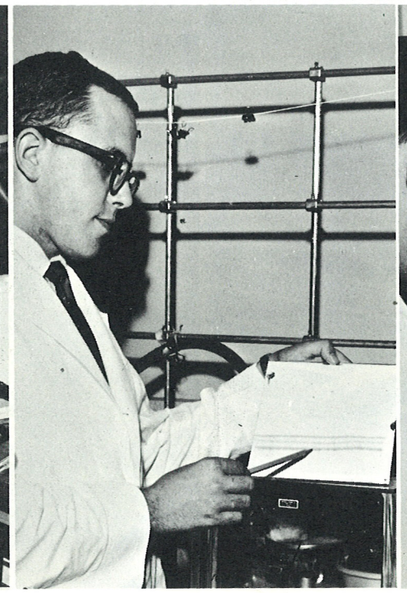


Measuring relative firmness of fresh halibut in a study of the quality changes in iced dressed fish. The Bureau's Technological Laboratory at Seattle developed this instrument.

Organic and analytical chemists perform a molecular distillation of phosphorus derivatives of fatty acids. Fish oil is an ingredient in fire-retardant paints and lubricant additives.

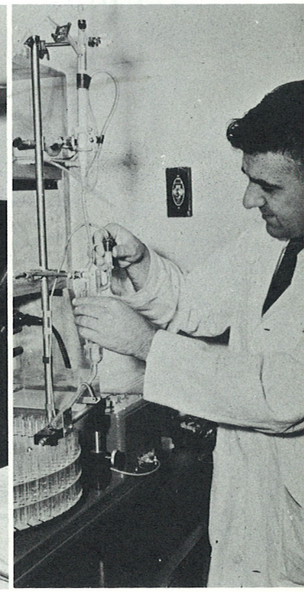


A chemist examines a thin-layer chromatographic plate used in the analysis of fish oil derivatives.



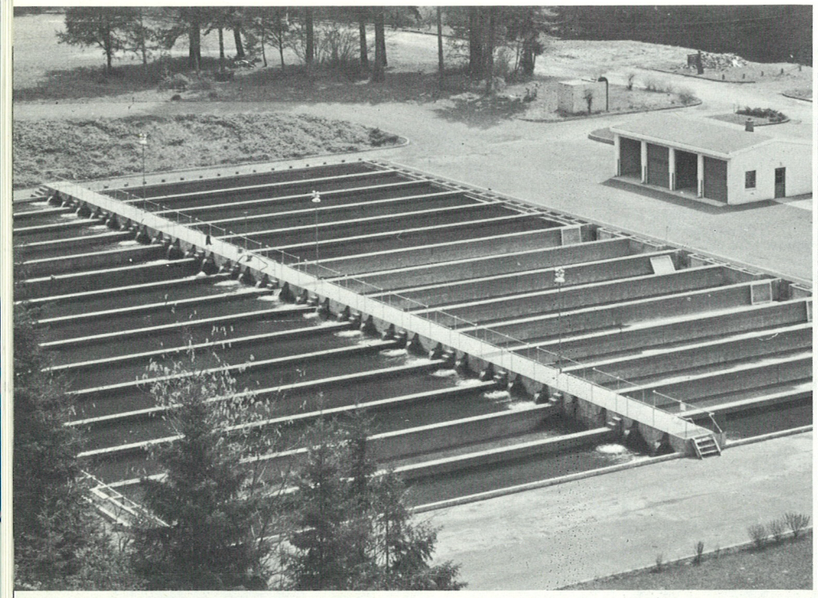
Nitrogenous compounds that indicate freshness or spoilage are extracted and separated from fresh fish as part of the study on radiation preservation of chilled fish fillets.

A microbiologist examines a culture of anaerobic bacteria found in the marine environment. Information from such studies leads to improvement of methods for extending the storage life of fresh fish.

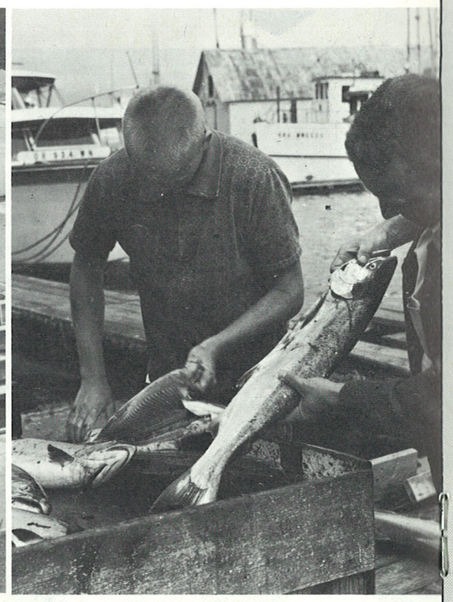


Columbia Fisheries Program Office

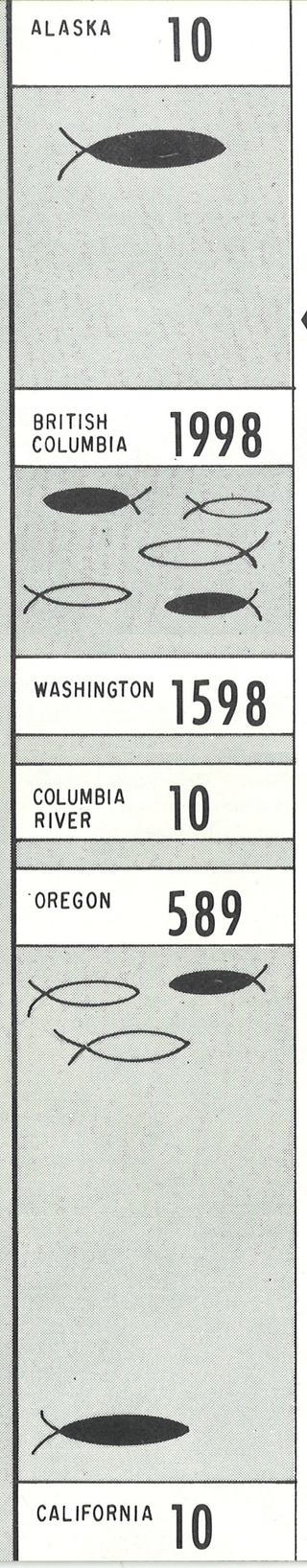
In 1949 the Congress authorized Federal funds to initiate a program to rehabilitate the salmon runs in the lower Columbia River; however, since 1938 the Federal Government has been engaged in fishery development work in this area. The present program is based on the recognized loss of fish and fish habitat at Federal water-use projects. The objective is the maximum development of the salmon and steelhead runs in the tributaries of the Columbia River. To supervise this work, the Columbia Fisheries Program Office is ideally located in Portland, Oreg., on the Columbia and Willamette Rivers. In addition to grant-in-aid functions, the Program Office is staffed to review water-development projects affecting anadromous fish resources and develop functional designs for a wide variety of fish facilities.



A part of the Columbia River Fishery Development Program has been the construction or reconstruction of 21 salmon and steelhead hatcheries in Oregon and Washington.



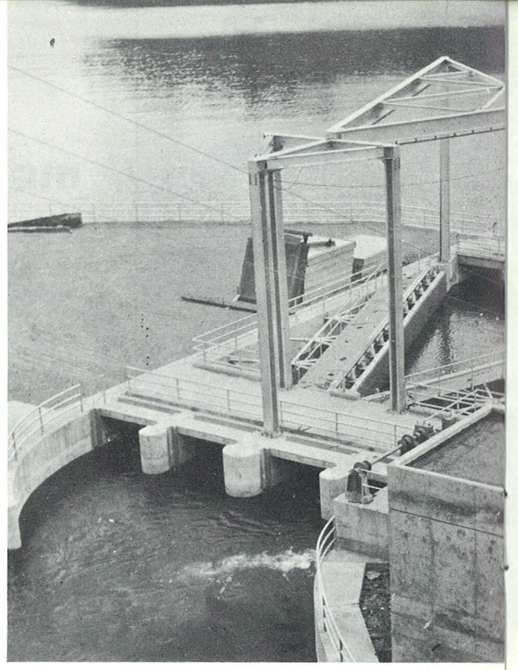
Biologists examining sport-caught adult fall chinook for scars where fins were clipped off. Missing fins indicate Program hatchery origin. First marked fish from this enormous hatchery evaluation program returned in 1964.

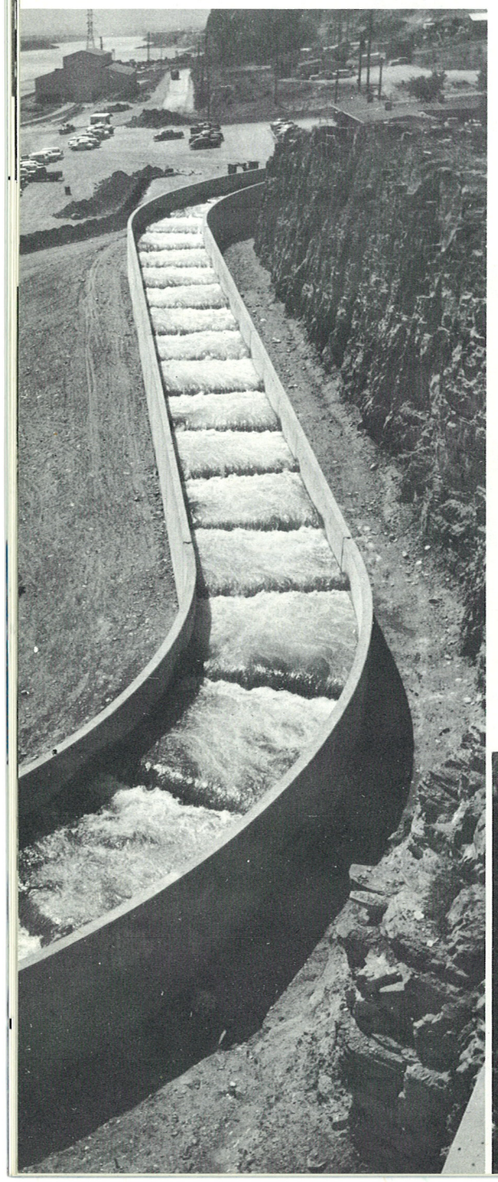


In an evaluation of the hatcheries of the Columbia River, 22,000,000 fall chinook salmon fingerlings have been marked by removing fins. An additional 8,000,000 will be marked in 1965. The location and number of fish recovered as of August 8, 1964, are indicated in the chart to the left. This evaluation will continue for several years.

Adult chinook salmon collected in the fishery, with the adipose fin missing, came from a hatchery.

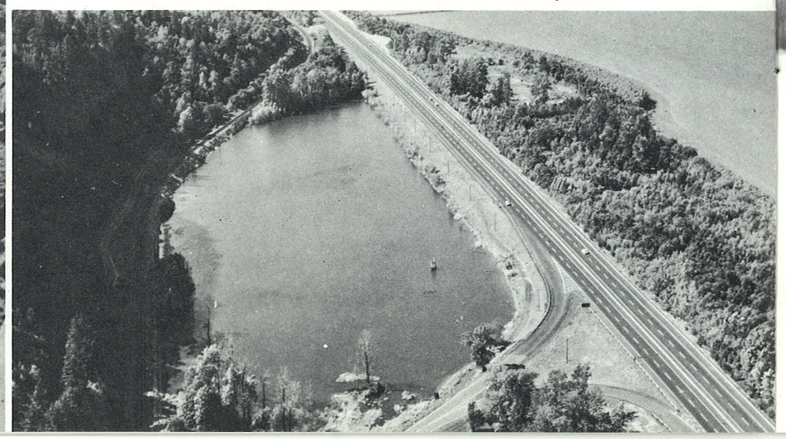
The safe passage of downstream migrating salmon and steelhead fingerlings is an important feature of many water development projects. Shown here is the right bay of a huge louver facility at Mayfield Dam on the Cowlitz River, Wash. The facility diverts downstream migrants into a bypass around the turbines. The functional design was developed at the Columbia Fisheries Program Office.





Dams and natural obstructions often completely block the upstream migration of salmon and steelhead. The efficient fishway at Rocky Reach Dam on Columbia River was designed with the aid of engineers in the Columbia Fisheries Program.

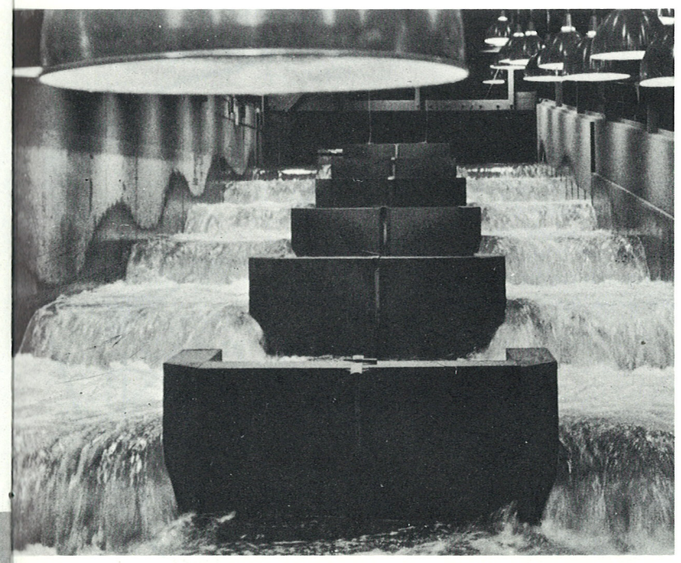
The use of natural and artificial impoundments for rearing salmon and steelhead is one of the more recent developments in fishery management. Regular hatchery production is supplemented by utilizing ponds such as this one created by highway construction along the Columbia River.

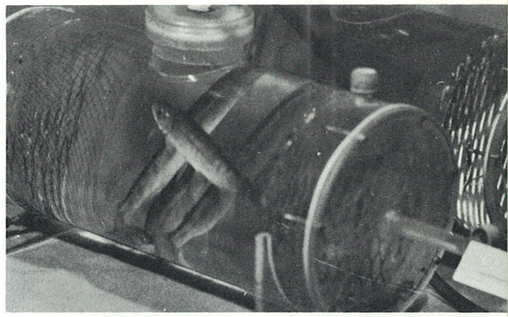


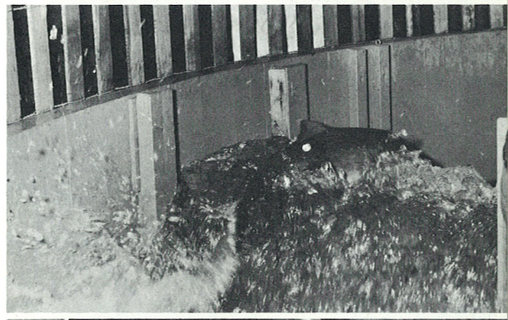
Fish-Passage Research

A large-scale program of research directed toward the solution of major fish-passage problems is being performed in cooperation with fishery agencies of the States of Washington, Oregon, and Idaho. The studies include research on the effect of impoundments created by dams on fish migration, methods of collecting (and guiding) downstream migrants from streams and rivers, passage of migrant fish at dams, and adaptability of salmon to new environments created by dams.

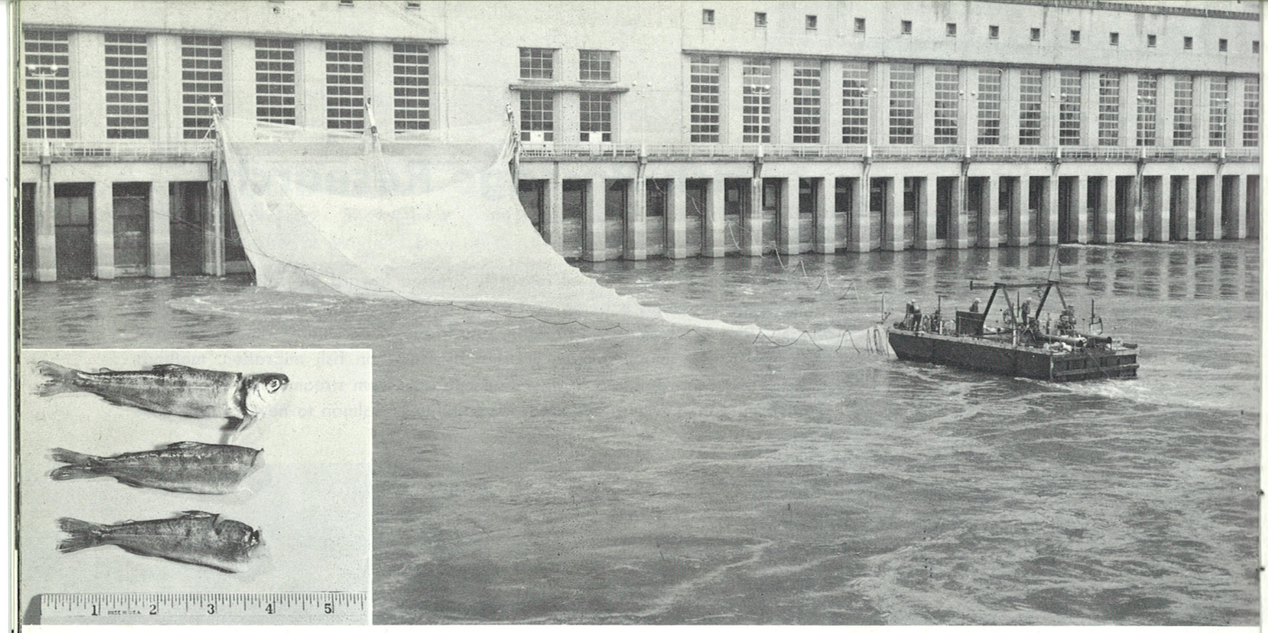
Testing of salmon and steelhead passage in full-scale models of the Ice Harbor Dam fishway weirs.



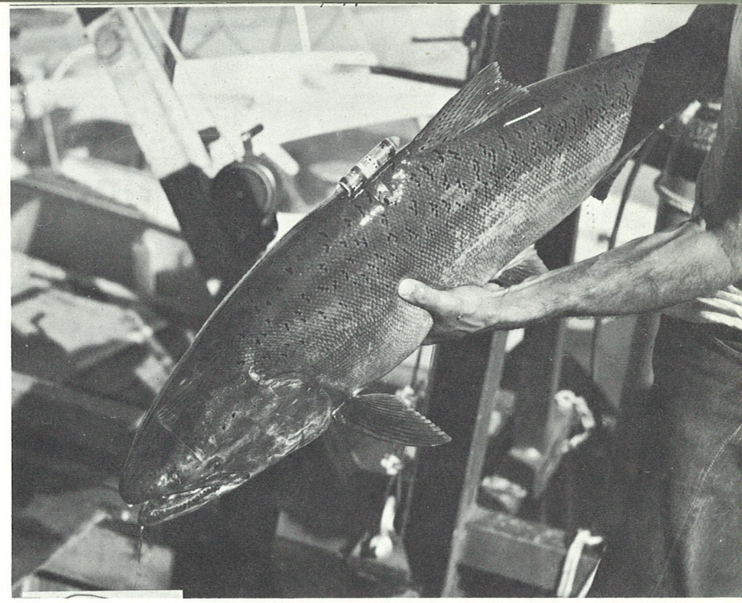




Behavior and response (1) Salmon fingerlings in a "respiratory chamber" yield information on daily oxygen use. (2) An adult chinook salmon swims over a weir in a Seattle laboratory after a long truck ride from Bonneville Dam. (3) Biologists stuff cotton in nasal cavity of adult salmon to determine importance of sense of smell for locating home stream (spawning grounds).

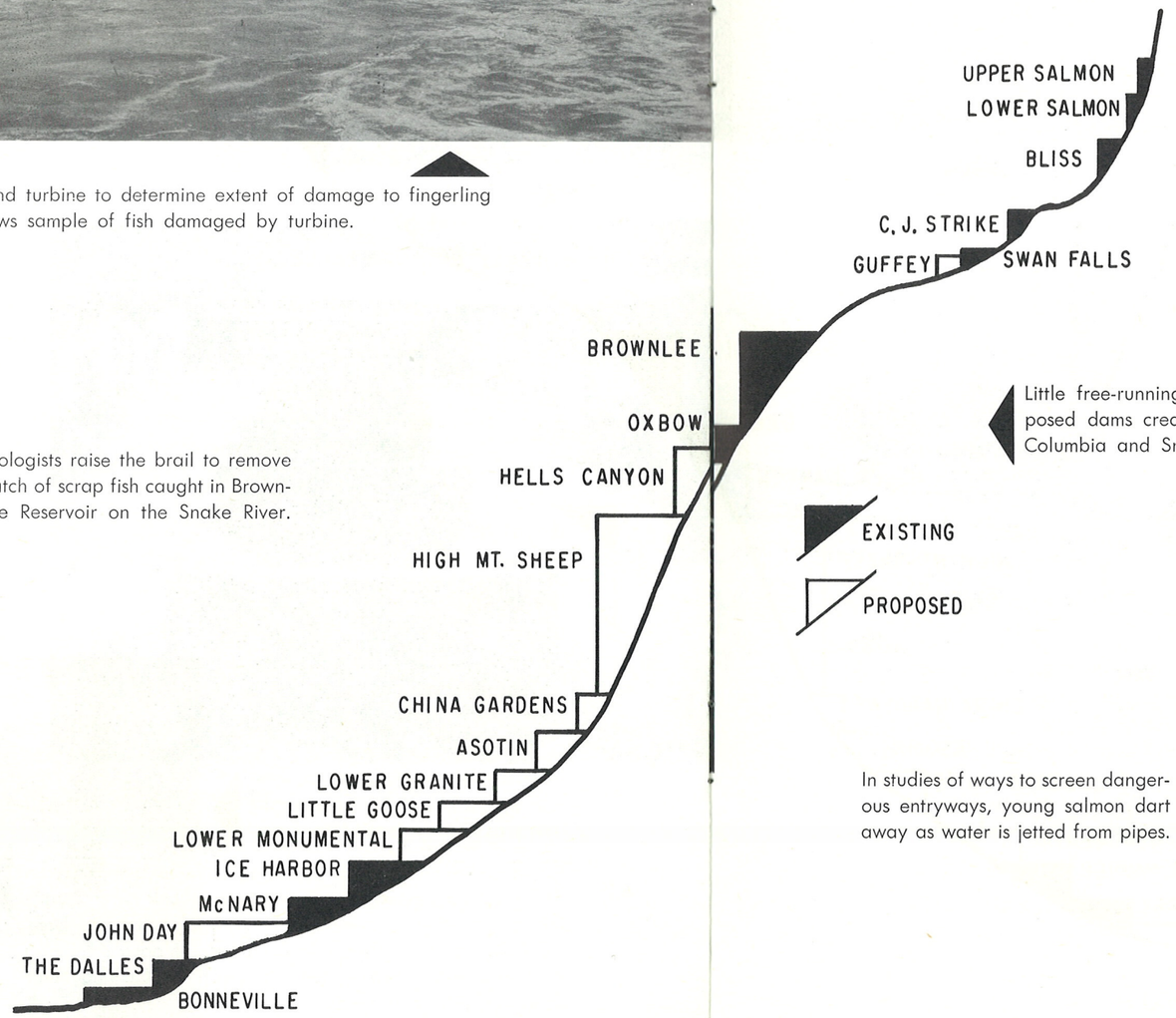


A giant net is lowered behind turbine to determine extent of damage to fingerling passing through. Insert shows sample of fish damaged by turbine.

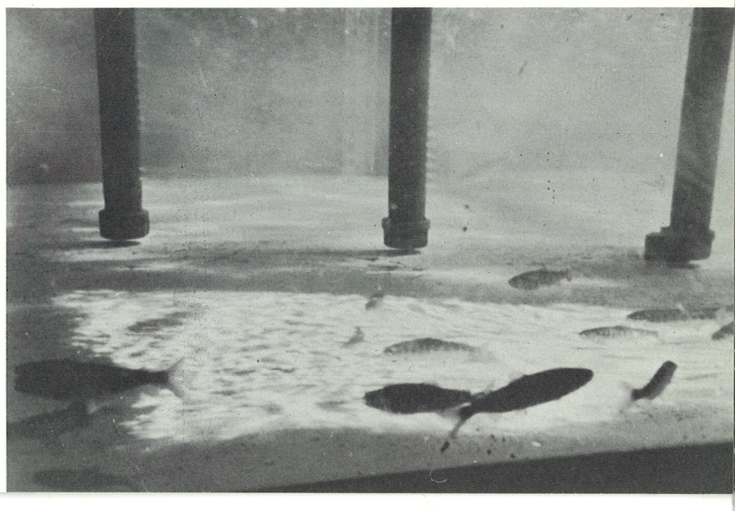


Large chinook salmon wears a sonic tag (miniature sonar pinger). The tagged fish can be followed by biologists in a boat specially equipped to detect the sonic pings.

Biologists raise the brail to remove catch of scrap fish caught in Brownlee Reservoir on the Snake River.



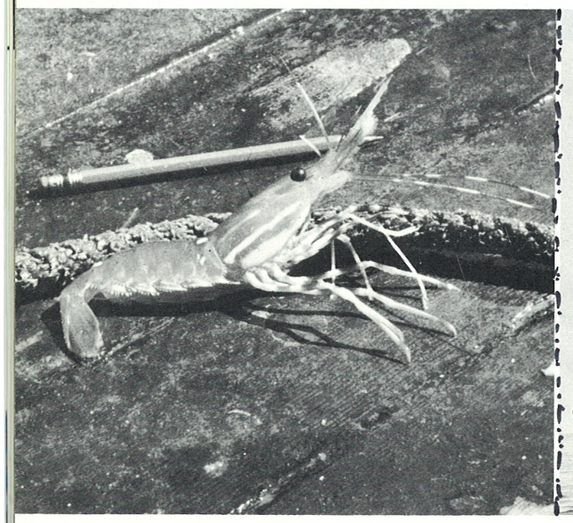
Little free-running river will be left when present and proposed dams create a series of pools and reservoirs in the Columbia and Snake Rivers.



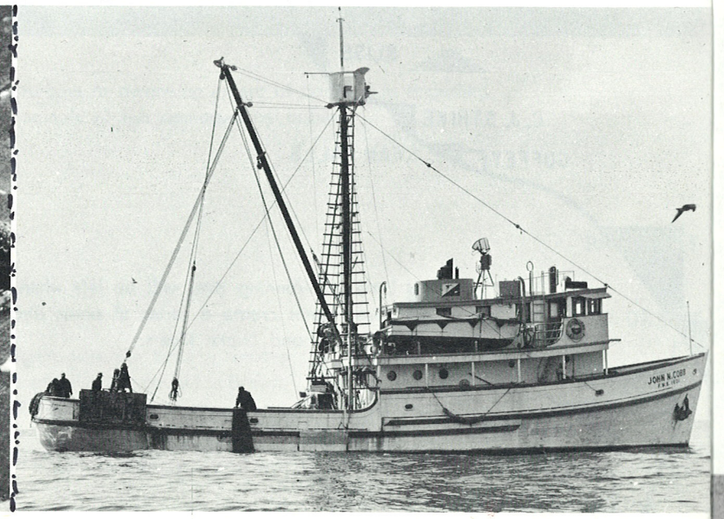
In studies of ways to screen dangerous entryways, young salmon dart away as water is jetted from pipes.

Exploratory Fishing and Gear Research

Exploratory fishing aids the growth of our commercial fisheries by expanding present fishing grounds, diversifying effort on present grounds, and discovering new fisheries. By developing better gear and improving fishing methods, research can help the domestic industry compete with foreign imports.



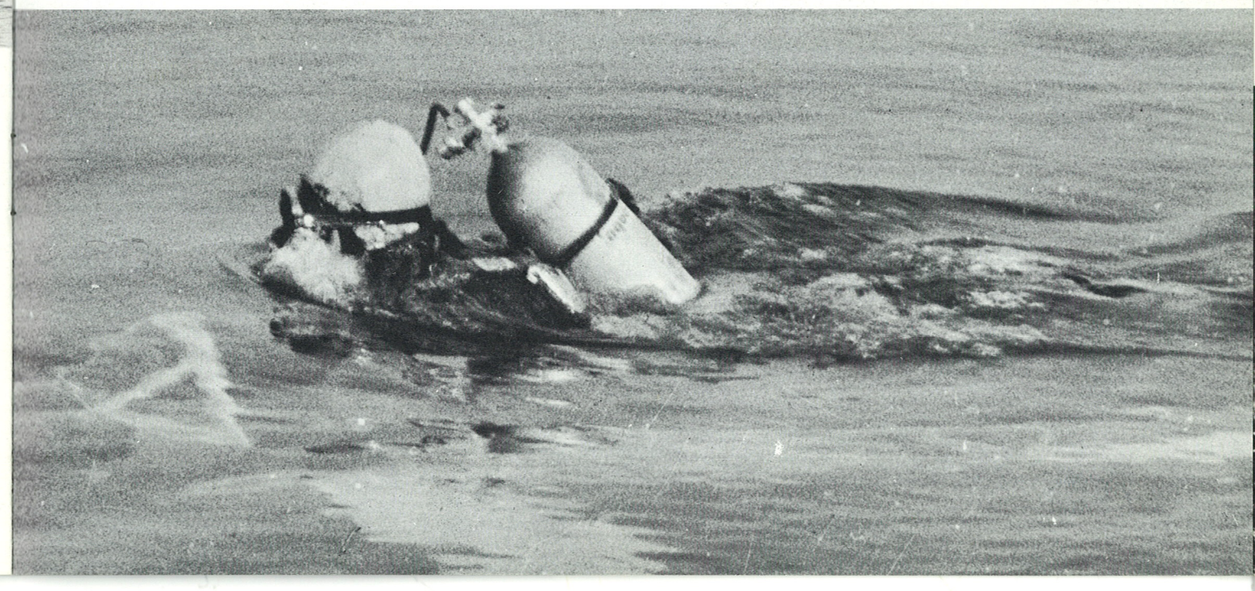
Large populations of shrimp have been located off the coasts of Oregon and Washington and in the waters of Central and Southeast Alaska. These discoveries have aided the expansion of the commercial shrimp industries of the Pacific Northwest.



The **John N. Cobb** is engaged in a wide variety of exploratory fishing and gear research programs. This 93-foot vessel carries eight crew members and normally two to four scientists.

Exploratory surveys have produced up to 60,000 pounds of hake per one-half hour of fishing time. This catch off the Washington coast was taken with a newly-developed midwater trawl and electronic telemetering gear to monitor the fishing depth of the net. Surveys suggest that hake comprise one of the largest unexploited fishery resources available in Pacific Northwest waters.

SCUBA diver preparing to descend aboard sea sled to observe midwater trawl in action. These observations provide a better understanding of gear design and operation.

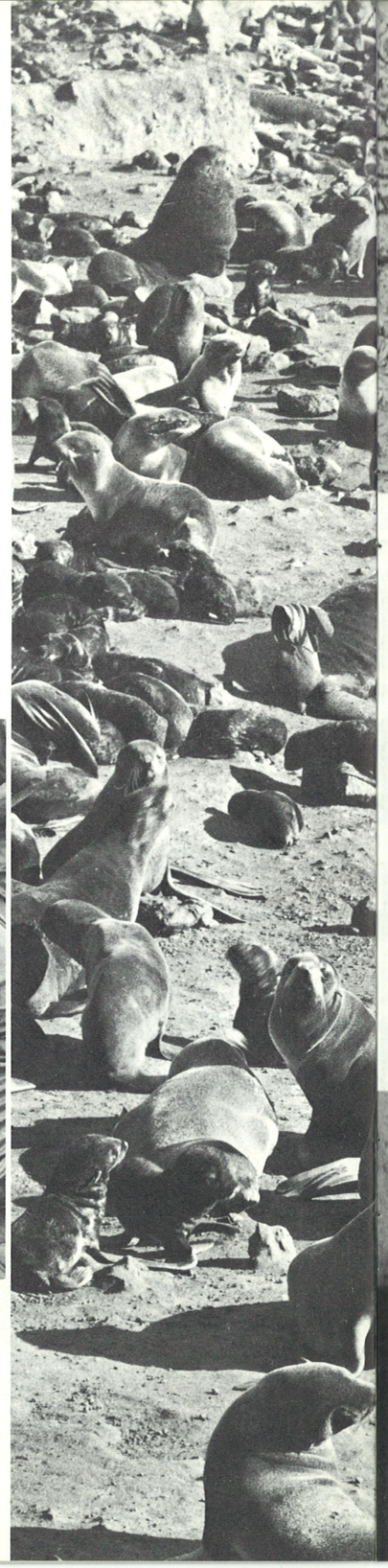


Marine Mammal Research and Management

Once nearly exterminated by fur hunters, the fur seal herds of the Pribilof Islands are now approaching their peak abundance under the research and management of the Bureau of Commercial Fisheries, whose success with the seals is an outstanding example of conservation in action. The Bureau also has a small research program on whales.

The United States has netted about $1,500,000 annually from its share of the seal pelts during the last 15 years. Japan and Canada receive shares of the seal pelts taken by the United States under the provisions of the Interim Convention on Conservation of North Pacific Fur Seals. The Soviet Union is also a participating nation under this Convention. The Bureau, in its Pribilof Islands Program, provides for the health, education, and welfare of about 600 Aleut resident natives.

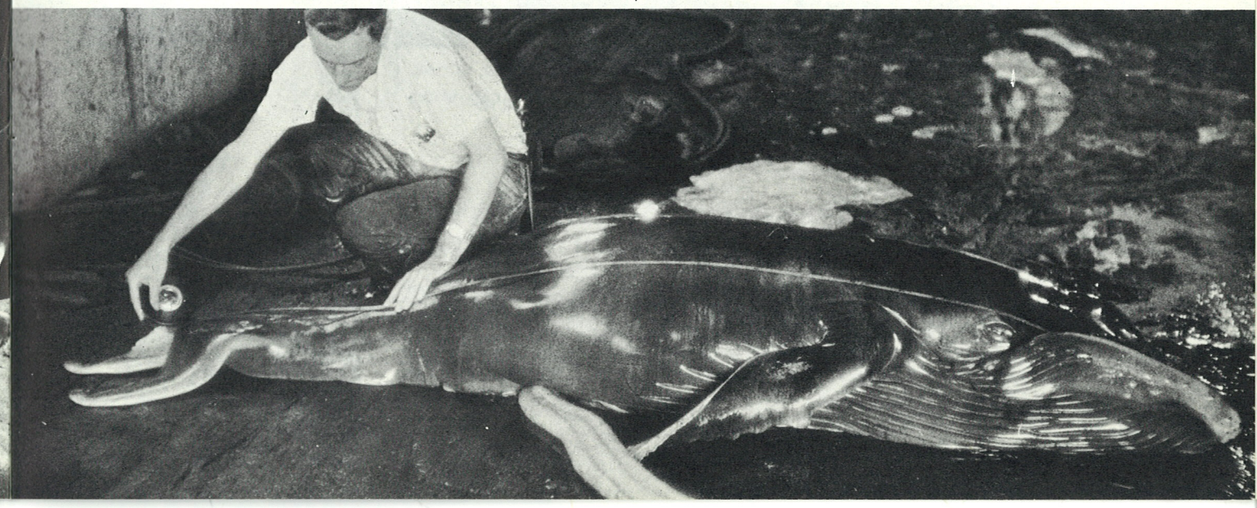
Biologists and Pribilof Islanders marking a fur seal pup by shearing hair patches. Marking provides valuable information on the abundance of the annual seal crop



Bull and females on fur seal rookery (Little Polovina) on St. Paul Island, Alaska. A bull may have as many as 100 females in a harem.

Measuring and weighing seals taken during pelagic fur seal research conducted in the Bering Sea.

Biologists obtain information about the whales taken by the two land stations located at Richmond, Calif., on San Francisco Bay. The fetus of the humpback whale shown is nearly eight feet long. At birth it would be about 15 feet long. An international management plan for whales of the North Pacific is a conservation need.



Marketing

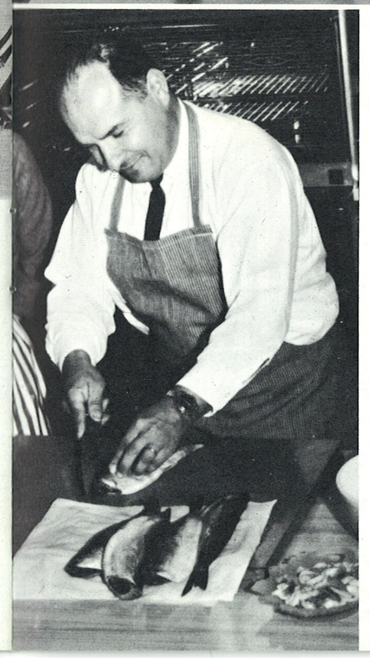
The basic aims of the Branch of Marketing are (1) to promote the free flow of domestically produced fishery products, (2) to develop and expand markets for fishery products of domestic origin, and (3) to promote the improvement of marketing practices. These aims are achieved through a broad range of educational, market development, and promotional activities designed to reach all segments from the producing fisherman to the consumer.

BG

A marketing specialist discusses merchandising with a fresh-fish retailer.

Educational exhibits are provided by the Bureau to promote the use of fishery products. Exhibiting at meetings and conventions also provides a point of contact to discuss marketing and use of fishery products with industry and food service personnel.

The housewife learns fish cookery through television demonstrations. Bureau Home Economists appear frequently on TV and radio. Other fish cookery demonstrations are given to institutions, restaurants, and other consumer groups, and, in cooperation with the Department of Agriculture, for the National School Lunch Program.



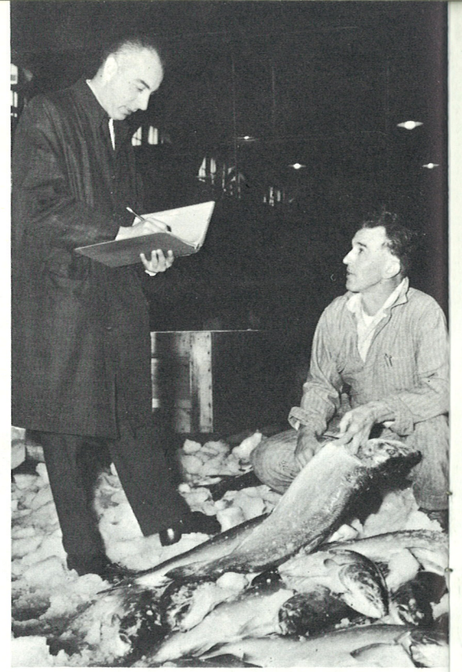
The educational program includes clinics for retailers, distributors, and institutional handlers of seafoods. A Bureau Marketing Specialist demonstrates the filleting technique.

Ordered BF ✓

Market News and Statistics

The Seattle Market News Service office is one of seven such offices strategically located throughout the United States. Through the daily publication of the landings, receipts, stocks, prices, and market conditions, this Service encourages the orderly marketing of fishery products and byproducts. In addition to the daily "Fishery Products Reports," many other types of reports of importance to the fishing industry are issued, including monthly and annual summaries. The Seattle office reports are mailed to nearly every State, and many foreign countries.

One of the 35 field offices of the Branch of Statistics is in Region 1, at Seattle, Wash. It is responsible for assembling data for Washington and Oregon on the number of fishermen, fishing craft, and quantity of gear engaged in taking fish and shellfish in these States; and volume and value of the catch; the production of manufactured fishery commodities; and related information. The data are compiled from the records of the State fishery departments or by surveys of fishermen, fishery wholesale dealers, and manufacturers. Statistical information on the fisheries is released in monthly and annual bulletins in the Current Fishery Statistics series and in the Bureau's annual digest, "Fishery Statistics of the United States."

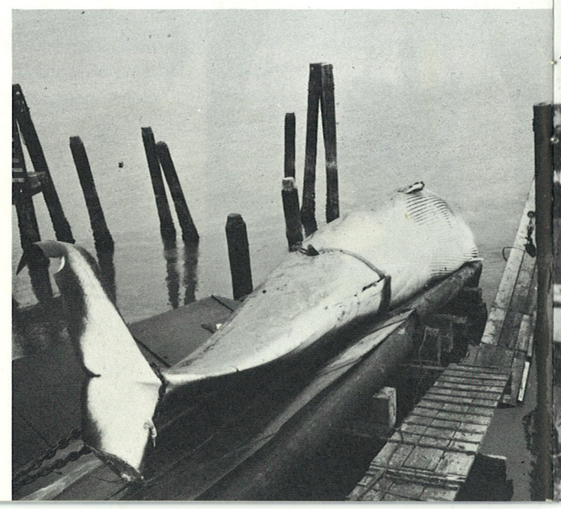


Market News reporter talks daily with industry personnel to obtain information for reports.

Enforcement

The Bureau of Commercial Fisheries, Branch of Enforcement, is responsible for enforcing international treaties, acts, and regulations for protection of the fisheries and marine mammals in our coastal waters. In cooperation with the U. S. Coast Guard and Washington State Department of Fisheries, aerial and surface patrols are made of international and territorial waters, to curtail infractions of the various acts, treaties, and regulations that were imposed to protect fishes and marine mammals.

A 65-foot fin whale being landed at a whaling station for processing. Regulations governing the time, size, and species of whales that may be taken are enforced by the governments of the countries participating in the whale fishery.



Loans and Grants

The Branch of Loans and Grants administers a fisheries loan program in the states of Washington and Oregon for financing and refinancing operations, maintenance, replacement, and repair of commercial fishing vessels damaged by explosion, fire, sinking, or collision. Loans valued at 3 million have been awarded to vessel owners in this Region. The Branch also conducts a mortgage and loan insurance program and a differential subsidy program for the construction of fishing vessels.

Vessels damaged by 1964 Alaska quake. The Bureau furnished loans to replace and rebuild lost and damaged vessels.

Created in 1849, the Department of the Interior—a department of conservation—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

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UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE