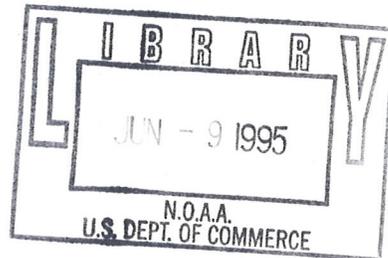
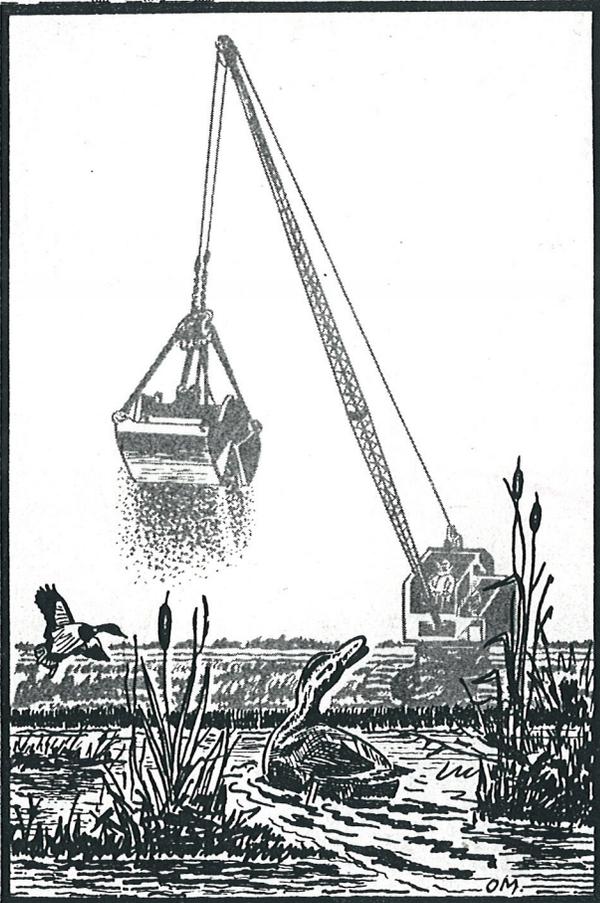


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**SUPPLEMENTARY
REPORT
June 1965**

on the
**COASTAL
WETLANDS**
INVENTORY
of
RHODE ISLAND



UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE,
BUREAU OF SPORT FISHERIES AND WILDLIFE, REGION - V BOSTON, MASS.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
DIVISION OF RIVER BASIN STUDIES
BOSTON, MASSACHUSETTS

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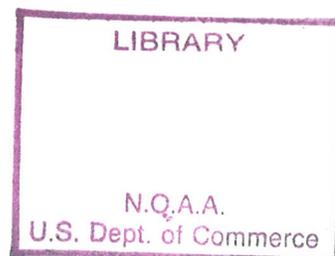


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Introduction

The 1964 resurvey of coastal wetlands was a part of a continuing periodic inventory and analysis of these valuable and irreplaceable natural resources. It was conducted by the Northeast Region, Bureau of Sport Fisheries and Wildlife, in cooperation with the State fish and game departments.

Earlier surveys revealed alarming wetland losses. As a result, increasing numbers of individuals and organizations were convinced of the urgent need to conserve and enhance the remaining marshes and the fish and wildlife dependent on these wetlands. Action was initiated. The Congress authorized the Accelerated Wetlands Acquisition program. A number of States began to develop legislation designed to preserve and protect marshes. Others expedited green acres programs, marshland purchases and options or agreements with landowners to accomplish the same purpose.

A brief summary of the various surveys completed during the past decade follows. Each survey was limited by the available time and manpower.

Increasing losses of wetlands of value to wildlife caused by agricultural drainage, filling for industry, housing, recreation, and other causes led to a national inventory of the marshes remaining in 1953-1954. This task was undertaken by the United States Fish and Wildlife Service in cooperation with the fish and game agencies of the States. The purpose of the inventory was to determine the location, quality, and acreage of the remaining wetlands used by wildlife. Data collected were published in 1956 in Wetlands of the United States, Circular 39,

U. S. Fish and Wildlife Service, Washington, D. C.

The national inventory was limited to those regions which contained 90 percent of the wetlands of importance to waterfowl in the individual states. In Rhode Island, this inventory excluded wetlands of less than 40 acres in size as too difficult to survey within a reasonable time. It was completed in October 1953. The data gathered during that survey appeared in the report Wetlands Inventory of Rhode Island, published in January 1954.

In 1954 - 1955, another survey was conducted to determine the vulnerability status of all high, moderate, low and negligible-value wetlands. The primary purposes of the vulnerability survey were to determine which wetlands were in danger of being destroyed and to identify the decimating factors. Each of the wetland units inventoried was classified and mapped according to the following criteria:

Class 1 - A wetland in which a known agent is adversely affecting the area for wildlife or is expected to do so within a 5-year period.

Class 2 - A wetland in which no known agent is adversely affecting the area for wildlife, but where there is a possibility that some factor will become operative in the near future.

Class 3 - A wetland in which no loss of value is anticipated.

In May 1959, a resurvey was initiated. Location and acreage of wetlands destroyed since 1954 were determined, as was the vulnerability to destruction of the remaining marshes. State-wide coverage included wetlands of high and moderate value equal to or exceeding 40 acres in size. In addition, coastal

marshes of all sizes and of low and negligible value were inventoried. The latter were included because of growing recognition of the importance of all coastal marshes to shellfish, finfish, and many wildlife species other than waterfowl. The role of these marshes in the accumulation and release of basic nutrients essential to maintenance of marine life of great commercial and recreational value and as spawning and nursery areas was recognized. In spite of this recognition, the official classification of values continued to be based solely upon original appraisals of value to waterfowl in order to facilitate comparisons. Data gathered during this survey appeared in the report Wetlands Inventory of Rhode Island, published in June 1960.

In May-June 1964, a second resurvey was completed to determine locations and acreages of coastal wetlands destroyed during the previous five years and to ascertain changes in vulnerability. This survey covered marshes of high, moderate, low, and negligible value earlier classified, in whole or in part, as coastal fresh or coastal saline (wetland types 12, 13, 16-18, as defined in Fish and Wildlife Circular 39). A number of these marshes included varying acreages of inland fresh areas (wetland types 2-4, 6,7). In such cases, the entire marsh was included in the survey.

The data for the various surveys were obtained with the cooperation of Thomas J. Wright, Chief; John Cronan, Supervisor of Fish and Game Management; Albert Zirllinden, District Game Biologist - all of the Rhode Island Division of Fish and Game; and William Snow, Game Management Agent, Bureau of Sport Fisheries and Wildlife.

Procedures

All wetlands covered in the various inventories were delineated on U.S.G.S. topographic maps. Waterfowl values for the majority of these areas were supplied by State game technicians - mainly by Mr. Wright. These values were

based on aerial waterfowl censuses and other records available in the files of the Rhode Island Division of Fisheries and Game. In cases where specific data were not available, evaluations were based on comparison with similar areas in the same vicinity.

The coastal wetlands were classified as to wetland type by field inspection. Acreages of each wetland, habitat types within individual wetlands, and losses were ascertained by either planimetry or by use of grid overlays.

Information relative to the vulnerability, ownership, and land-use of the wetlands was compiled during field examinations and supplemented with information provided by personnel of the Division of Fisheries and Game.

The 1964 resurvey was done on the ground by automobile and on foot. Location and extent of losses occurring since the 1959 inventory were plotted on the topographic maps in the field. Acreages destroyed were subsequently measured by planimeter.

Coverage

The 1964 resurvey covered 24 wetlands located in Bristol, Newport, and Washington Counties. These marshes totaled 2,315 acres at the time of the original survey. At least 90 percent of the coastal units of all sizes and values to waterfowl were covered. The 1964 survey data could be compared with that gathered during the previous inventories of 1959 and 1954, because the information obtained on the high, moderate, low, and negligible-value coastal wetlands was a common feature of all three surveys.

Insofar as possible, causes of destruction and current vulnerability to destruction were based on the ground inventory. These data were supplemented by State biologists. Vulnerability was interpreted and projected in terms of

trends indicated by the original 1954 survey and the two resurveys of 1959 and 1964.

Findings and Discussion

The 123 acres of coastal wetlands lost between 1954 and 1964 (table 1) represent 5.3 percent of such wetlands existent in 1954. There are no complete records of destruction prior to 1953. Acreages destroyed during each of the two five-year periods covered by the inventories decreased slightly; from 71 acres during 1954-1959 to 52 acres during 1959-1964.

Table 1. Acreage of Coastal Wetlands Lost, Rhode Island, 1954 - 1964

County	1954 Acreage	Losses 1954 - 1959	1959 Acreage	Losses 1959 - 1964	1964 Acreage	Total Losses 1954 - 1964
Bristol	755	10	745		745	10
Newport	700	6	694	10	684	16
Washington	860	55	805	42	763	97
Totals	2,315	71	2,244	52	2,192	123

The rate of destruction also decreased slightly if each of the five-year periods is considered separately. About 3.1 percent of the marshes existent at the beginning of the period were destroyed during 1954-59. In contrast, 2.3 percent of the marshes existent at the beginning of the period were lost during 1959-64.

The above data indicate both the limited acreage of the wetlands and the attendant drastic effects in terms of percentages of loss caused by the destruction of relatively small marshes. Obviously, Rhode Island can ill-afford any further loss of marshes.

The extensive type of survey used in both 1959 and 1964 was not designed to reveal with exactitude any destruction or damage other than the physical loss of marshes. There was, of course, destruction of wetland other than marsh. This was largely within the saline sounds and bays or coastal open fresh water.

Mudflats and other areas exposed at mean low tide, the open water seaward from mean low tide, and open fresh coastal waters (wetland types 19, 19p, and 14 respectively) are integral parts of the wetland complex and are vital to a variety of wildlife and fish. Mud flats are particularly valuable as feeding areas for wintering waterfowl. Because there was no systematic measurement of these losses, no data on the three wetland types listed above are included in this report.

This exclusion of the above wetland types is an important factor in Rhode Island. The State contains extensive acreages of permanent waters in the series of salt water ponds extending along the entire shoreline. Although not included in this inventory, these ponds are valuable waterfowl habitat. Because of their importance as producers of shellfish and finfish, these ponds remain relatively undisturbed.

In addition, the quality of many of the remaining marshes declined. Siltation from adjacent fill, deliberate or incidental diking, drainage, and mosquito-control resulted in marsh deterioration due to loss of basic productivity or interference with the tidal interchange of nutrients. Such deterioration may be marked only by slow changes in plant zonation; i.e., almost imperceptible shifts from one cordgrass (Spartina alterniflora) to another (S. patens) or from the latter species to other plants adapted to still dryer conditions. Damages resulting from pollutants were not measured.

Finally, there was a further reduction in the value of relatively undamaged wetland to wildlife, particularly to waterfowl. It was measurable in decreasing use and was attributable to added disturbance and stress. The basic causes were the intensified use of areas adjoining the marshes by increasing numbers of people and the dwindling sizes of many of the larger marshes.

Based on wetlands existent in 1954, losses during the succeeding ten years by counties were: Bristol, 10 acres (1 percent); Newport, 16 acres (2 percent); and Washington, 97 acres (11 percent).

The major causes of wetland losses were, as could be expected in the Northeast, associated with population growth and industrialization (table 2). Bridges, roads, and parking accounted for more wetland losses than any other cause. Seventy-five acres, or 61 percent of the destruction during the period 1954 - 1964, were attributable to this cause.

Marinas, docks, and channels were the second most significant cause of losses. Twenty acres of wetlands, 16 percent of the loss, was the result of these water-associated developments.

Table 2. Causes of Coastal Wetlands Losses, Rhode Island, 1954 - 1964

Cause of Loss	County (Acres)						Acres	%
	Bristol		Newport		Washington			
	1954-59	1959-64	1954-59	1959-64	1954-59	1959-64		
Bridges, roads, and parking	10	---	---	3	50	12	75	61
Marinas, docks, and channels	---	---	---	---	---	20	20	16
Waste Disposal	---	---	6	7	---	---	13	11
Miscellaneous Fill*	---	---	---	---	---	10	10	8
Housing	---	---	---	---	5	---	5	4
Totals	10	---	6	10	55	42	123	100

* This term was used when ultimate use of the filled area was unknown.

Waste disposal, primarily dumps, was the third most important cause of wetland losses. Approximately 13 acres of destroyed wetlands, 11 percent of the losses during 1954 - 1964, were attributable to waste disposal.

Miscellaneous fill, a term indicating that ultimate use of the spoil deposition site was not known, accounted for ten acres and eight percent of the losses. Such fill was largely spoil from hydraulic dredging for channel or harbor maintenance or improvement, or from marina and dock construction. The greater part of this miscellaneous fill will eventually be utilized for housing, industry, or similar purposes.

Housing obliterated five acres of wetlands and accounted for four percent of the total losses.

The Rhode Island wetlands continued to be highly vulnerable to destruction (table 3). Approximately 85 percent of the wetlands were considered vulnerable and placed in classes 1 and 2 in 1964. In 1954, these classes included 89 percent of the total; in 1959, 99 percent.

Table 3. Vulnerability of Coastal Wetlands, Rhode Island, 1954 - 1964

County	1954 Vulnerability Class - Acres			1959 Vulnerability Class - Acres			1964 Vulnerability Class - Acres		
	1	2	3	1	2	3	1	2	3
Bristol		755			745			724	21
Newport	90	360	250	84	605	5	74	454	156
Washington	390	470		395	410		358	240	165
Totals	480	1,585	250	479	1,760	5	432	1,418	342
Percent	21	68	11	21	78	1	20	65	15

Several small and one large area were considered highly vulnerable (class 1) in 1964. The latter was the 150-acre Narrow River area at Narragansett. It was in danger of being destroyed by housing, marinas, and accompanying channelization work. This is an important area for migrating waterfowl.

During the past decade, the more notable fluctuations in vulnerability were in class 3, the 'safe' category. In 1954, about 11 percent of the coastal wetlands

were so classified; in 1959, less than 1 percent was in class 3; and in 1964, 15 percent were considered 'safe'. In the main, these changes reflect the status of a single coastal wetland - Sapowet Marsh in Newport County. Although not State-owned at the time, no loss of value for the 350-acre area was anticipated in 1954. In 1959, however, the major part of the marsh was placed in class 2 because of planning for a large marina. In 1964, the Division of Fish and Game owned 156 acres in the Sapowet State Management Area.

The Division of Fish and Game obtained ownership to several coastal wetlands totaling 342 acres during 1959-1964. These acquisitions accounted for all the lands in the 'safe' category at the end of this period.

Barring some unforeseen major development along the Rhode Island shore, there is a possibility that a peak in both vulnerability and rate of destruction has been reached. The growing interest in conservation was reflected in enactment of the Green Acres Program in 1964 and in the Marshland Zoning law of May 1965.

The Green Acres Program authorized and provided for land acquisition and conservation easements. The Zoning law, in essence, established a system of coastal wetland zoning under the Director of the Department of Agriculture and Conservation. This agency was superseded by the Department of Natural Resources. The latter agency currently administers the Zoning law. Provision was made for landowners to collect damages resulting from zoning. These legislative acts were designed, wholly or in part, to preserve and conserve coastal marshes. It is, of course, too early to determine effects.

Summary and Conclusions

A second resurvey of the Rhode Island coastal wetlands, completed in June of 1964, revealed that the destruction of the State's marshes continued. The rate of

destruction decreased slightly. Measured wetland losses during 1959-1964 totaled 52 acres. In comparison, 71 acres were destroyed during 1954-1959. The 123 acres of marshes obliterated during the past decade represented 5.3 percent of the coastal wetlands existent in the State in 1954. There were additional and substantial unmeasured losses. These included dredging and spoiling on tidal flats as well as those resulting from siltation, pollution, diking, drainage, mosquito control, and increasing human activities adjacent to the dwindling marshes.

Major causes of losses, with acreages and percents of the total, were: bridges, roads, and parking, 75 acres (61 percent); marinas, docks, and channels, 20 acres (16 percent); waste disposal, 13 acres (11 percent); miscellaneous fill, 10 acres (8 percent); and housing, 5 acres (4 percent).

The vulnerability of the wetlands to destruction remained high. In 1964, approximately 85 percent (1,850 acres) of the remaining coastal marshes were classified as vulnerable while 15 percent (342 acres) were considered 'safe'. All lands in the latter class were owned by the State Division of Fish and Game.

The more notable changes in vulnerability over the past decade were in the 'safe' category. The proportion of wetlands in which no loss of value was anticipated ranged from 11 percent in 1954 to 1 percent in 1959 and back to 15 percent in 1964.

The Green Acres Program and the Marshland Zoning law, enacted by the General Assembly in 1964 and 1965, respectively, indicate that both vulnerability and rate of destruction of the coastal wetlands may decrease in the future.