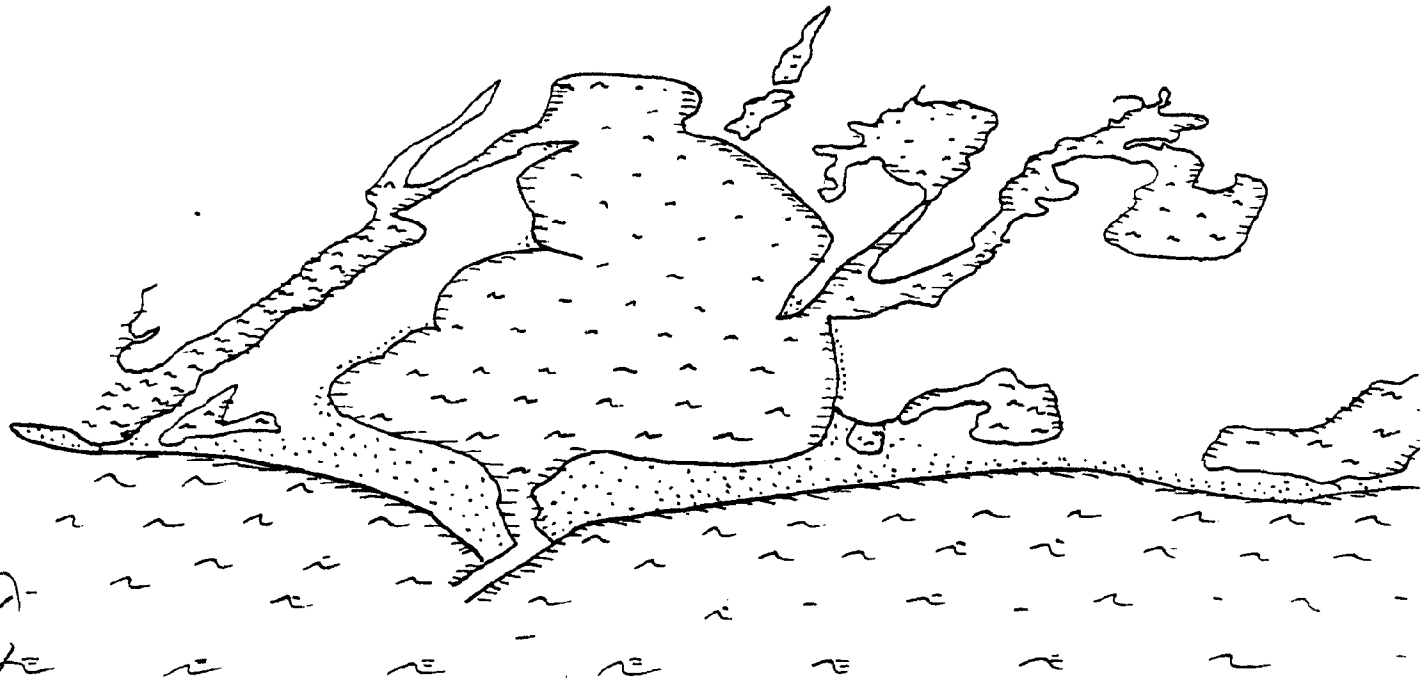

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Draft Environmental Impact Statement
&
Draft Management Plan

WAQUOIT BAY NATIONAL ESTUARINE SANCTUARY

COASTAL ZONE
INFORMATION CENTER

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
Ocean Service
Programs Division

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1984

COMMONWEALTH OF MASSACHUSETTS
Executive Office of Environmental Affairs

UNITED STATES

DEPARTMENT OF COMMERCE

DRAFT ENVIRONMENTAL IMPACT STATEMENT

AND

DRAFT MANAGEMENT PLAN

WAQUOIT BAY NATIONAL ESTUARINE SANCTUARY

JULY 1984

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DESIGNATION: Draft Environmental Impact Statement

TITLE: Proposed acquisition and development of a Waquoit Bay National Estuarine Sanctuary and preparation of a Draft Sanctuary Management Plan

ABSTRACT: The Commonwealth of Massachusetts has submitted an application for Federal financial assistance to establish a national estuarine sanctuary in the area around Waquoit Bay in the Towns of Mashpee and Falmouth, Massachusetts. The Waquoit Bay National Estuarine Sanctuary, located adjacent to Nantucket Sound, is proposed to include approximately 2,232 acres of land and water (1,297 acres of open water, 316 acres of marsh, and 619 acres of adjacent uplands). The acquisition and development Federal financial assistance request to the National Oceanic and Atmospheric Administration for $1,800,000, matched by the Commonwealth, would be used for fee simple acquisition of certain land and wetland areas of the Swift estate, and the salt marsh areas around Waquoit Bay, Hamblin and Jehu Ponds (approximately 193 acres), to develop and renovate research and interpretive facilities within the proposed Sanctuary, and to prepare a final management plan for the Sanctuary. All other land within the proposed Sanctuary is in public ownership.

Approval of this financial assistance application would permit the establishment of a national estuarine sanctuary representing a subcategory of the Virginian biogeographic region. The proposed sanctuary would be used primarily for research and education purposes, especially to provide information useful for coastal zone management decisionmaking. Multiple uses (e.g., traditional activities) would be allowed to the extent that they are compatible with the proposed Sanctuary's research and educational programs and the protection of Sanctuary resources consistent with the Sanctuary's character as a natural field laboratory.

Research and monitoring in and near the proposed Sanctuary would provide baseline information against which the impacts of human activities in similar coastal areas elsewhere in the Commonwealth of Massachusetts and the Virginian biogeographic region could be assessed.

APPLICANT: Commonwealth of Massachusetts
Massachusetts Executive Office of Environmental Affairs

LEAD AGENCY: U.S. Department of Commerce
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LIST OF ACRONYMS

ACEC	Areas of Critical Environmental Concern
COE	Corps of Engineers
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
DEM	Department of Environmental Management
DMP	Draft Managment Plan
EIS	Environmental Impact Statement
EOEA	Executive Office of Environmental Affairs
MP	Management Plan
NESP	National Estuarine Sanctury Program
NOAA	National Oceanic and Atmospheric Administration
OCZM	Office of Coastal Zone Management
OCRM	Office of Ocean and Coastal Resource Management (NOAA)
REICEP	Research and Education Information Coordination and Exchange Program
WBNES	Waquoit Bay National Estuarine Sanctuary

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SUMMARY

The National Estuarine Sanctuary Program (NESP) was established under the authority of Section 315 of the Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1461). The NESP provides for a Federal-State partnership to establish representative estuarine areas as national estuarine sanctuaries. Such areas are established to: (1) provide opportunities for long-term estuarine research, education and interpretation; (2) provide a more informed basis for making coastal management decisions; and (3) enhance public awareness and understanding of the estuarine environment. Federal funding, along with matching funds provided by the State, are used to acquire, develop, and operate estuarine areas that are incorporated with the National Estuarine Sanctuary System.

To ensure that the National Estuarine Sanctuary System includes sites that adequately represent regional and ecological differences, the National Estuarine Sanctuary Program regulations establish a biogeographical classification scheme that reflects regional differences in biogeography and an estuarine typology system to ensure the inclusion of a variety of ecosystem types. The biogeographical classification scheme and estuarine typology system are presented in Appendix 2. Eleven biogeographic regions and twenty-seven (27) biogeographic sub-regions are identified in the National Estuarine Sanctuary Program regulations.

Based on the results of an Estuarine Research Program and meetings held concerning the National Estuarine Sanctuary Program, and after a thorough review of alternative sites within the coastal area of the Commonwealth, Massachusetts recommended Waquoit Bay for designation as a national estuarine sanctuary in July 1981. In September 1981 NOAA awarded, and the State matched, a "pre-acquisition" Federal financial assistance award for further evaluation of the site, the collection of information necessary for management plan and draft environmental impact statement preparation, and preliminary acquisition activities. The Commonwealth of Massachusetts has now submitted an application to NOAA to acquire and develop a national estuarine sanctuary in an area consistent with its 1981 pre-acquisition proposal.

The proposed Waquoit Bay National Estuarine Sanctuary is representative of the Southern New England (Cape Cod to Sandy Hook) portion of the Virginia biogeographic region. In addition, the Sanctuary would be located within the transitional border between the Virginian and Acadian biogeographic regions. Specifically, Waquoit Bay is located adjacent to Nantucket Sound on the south side of Cape Cod in the towns of Falmouth and Mashpee in Barnstable County. The boundary proposed for the Waquoit Bay National Estuarine Sanctuary includes all of Waquoit Bay; Jehu, Hamblin, Caleb, Sage Lot and Flat Ponds; the Little and Great Rivers; and portions of the Quashnet River. Also included in the boundary for the proposed sanctuary are the adjacent uplands on Washburn Island, and portions of the South Cape Beach State Park and portions of the Swift Estate at the northern end of the Bay. The boundary of the proposed Waquoit Bay National Estuarine Sanctuary largely reflects the boundary developed for the State-designated Waquoit Bay Area of Critical Environmental Concern.

Although much of the upland and marsh areas of the proposed sanctuary are now under State control as a result of the Commonwealth's recent acquisition of major parcels within the proposed Sanctuary, South Cape Beach and Washburn Island, the Commonwealth is requesting Federal funds for the purpose of: (1) acquiring in fee simple or by easement the wetlands, waters, and uplands of the Swift estate at the head of Waquoit Bay and developing a sanctuary visitors center with support facilities for sanctuary research and education programs; (2) acquiring a fee simple, or less than fee simple (e.g., conservation easement, access rights for research and education purposes, etc.), property interest in the marsh areas adjacent to Hamblin and Jehu Ponds; and (3) the construction of necessary support facilities and equipment for sanctuary research and education (e.g., docks, boardwalks, interpretive exhibits, shelters, etc.). The current owner of the Swift Estate has indicated willingness to part with parcels comprising approximately 16 acres. The Commonwealth has initiated an appraisal of the property and negotiations with the owners. The marshes around Hamblim and Jehu Ponds are presently protected from development by the Wetlands Protection Act and, for the marshes located in the Town of Falmouth, the Wetlands Restriction Act. Because the Commonwealth has, or soon will have, adequate authority to ensure major activities may not be undertaken in any of the salt marsh areas that would have an adverse impact on the estuarine resources of the sanctuary, it is not anticipated that the Commonwealth would consider exercising its power of eminent domain in these marsh areas. Other than the Swift Estate and the marsh areas surrounding Hamblin and Jehu Ponds, all other land and water areas within the proposed boundaries of the Sanctuary are in public ownership.

In addition to their protection, guaranteed access to the Hamblin and Jehu Pond marshes for research or educational purposes is important to Sanctuary operation. The fragile nature of the marshes precludes wide public access, but assured limited access is important for both research and interpretive activities. As a result, following Federal approval of the Federal financial assistance award for acquisition and development, it is the intention of the Commonwealth to approach owners to ascertain their interest in donation, sale, or voluntary restriction of or easements over these parcels. Avenues of tax abatement or exemption will be investigated to make such actions as attractive as possible. Every effort will be make to pursue these actions only with willing participants.

Under the preferred alternative, administration of the Waquoit Bay National Estuarine Sanctury will be under the direction of the Massachusetts Department of Environmental Management (DEM). As the Commonwealth's principal holder of land for environmental and conservation purposes, DEM is the best-equipped State agency to manage any new properties acquired as part of the sanctuary designation. In addition, DEM's existing interpretive program will provide the foundation for the planned educational activities sponsored by the Sanctuary. A Sanctuary Manager will be the principal administrator of the Sanctuary and will be responsible for ensuring that the policies contained in the Sanctuary Management Plan are followed. This individual will be employed and supervised by the Department of Environmental Management. A portion of the Swift Estate will be acquired by the Commonwealth and developed as a headquarters for Sanctuary operations and for Sanctuary research and education activities. Major Sanctuary management goals are: to establish and manage the area within the

boundaries of the Waquoit Bay National Estuarine Sanctuary as a natural field laboratory; to protect the natural resources of the wetlands, transitional areas, and adjacent uplands; to conduct and facilitate both short and long-term estuarine research, education, and interpretation; to gather and distribute information on estuarine ecosystems that is essential to sound decisions regarding the management of coastal resources; and to provide for controlled multiple use of the Sanctuary to allow for the continuation of existing low intensity recreational uses that are presently permitted, including fish and wildlife recreation (e.g. hunting, fishing, wildlife observation) and boating, which are compatible with the sanctuary's character as a natural field laboratory. Research and education programs will be developed for the sanctuary. The basic elements of these programs, and policies for their implementation, are presented in this draft EIS.

Alternatives to the proposed action include: no action; alternative sites; alternative boundaries for the Waquoit Bay site; and alternative management plan options. The no action alternative would preserve the status quo; no designation of a national estuarine sanctuary would be made; a natural field laboratory would not be established; and both short and long-term estuarine research, education and interpretation would not be conducted or facilitated. Several alternative sites in the coastal area of Massachusetts were examined and rejected. Waquoit Bay was selected as the optimum site as a candidate for national estuarine sanctuary designation. Several areas in and around Waquoit Bay were considered for inclusion within the boundaries of the sanctuary. Various alternative boundaries were examined that included or excluded the following areas: the Town of Mashpee in-holdings at South Cape Beach State Park, the Little and Great Rivers, the saltmarsh areas around Hamblin and Jehu Ponds, ACEC areas beyond the immediate Waquoit Bay area, and the Eel Pond and Childs/Seapit Rivers area. Of these areas only the Little and Great Rivers and the marshes around Hamblin and Jehu Ponds were identified as key land and water areas the protection of which is necessary for sanctuary designation. As a result, these areas are included in the preferred boundary alternative for the Sanctuary. Management alternatives examined and rejected included: greater restriction on public access to South Cape Beach and Washburn Island, location of the Sanctuary headquarters somewhere other than the Swift Estate; and administration of the Sanctuary by State agency other than the Department of Environmental Management.

The principal resources affected by the proposed action include, in general, approximately 2,232 acres of marsh, open water, and uplands. The sanctuary site is an estuarine embayment, which connects a series of tidal ponds, and represents the last remaining large unaltered estuary on the south shore of Cape Cod. Waquoit Bay is separated from Nantucket Sound by two barrier beaches. This area supports a wide variety of terrestrial and estuarine biota that is primarily temperate with some boreal representatives. The area is characterized by a high species diversity due to the intermingling of cold water species from the Gulf of Maine and warm water species from the mid-Atlantic. Plant and animal species of special interest occur in the area, including sand plain gerardia, bushy rockrose, butterfly weed, little ladies tresses, shortnose sturgeon, least tern, and the northern diamondback terrapin. Waquoit Bay and its adjoining waters support an active local fishery, serve as

a primary nursery area, and, as a direct result of their high aesthetic value, are popular recreational boating areas. The upland areas of South Cape Beach and Washburn Island also support a number of traditional hunting activities. Species generally hunted in these areas include pheasants, rabbits, squirrels, quail, and migratory waterfowl.

The environmental effects of the proposed action would be beneficial in terms of research, education, traditional uses, and natural resource protection benefits. There would be no adverse impacts to residents because the areas proposed to be included in the Sanctuary are not inhabited.

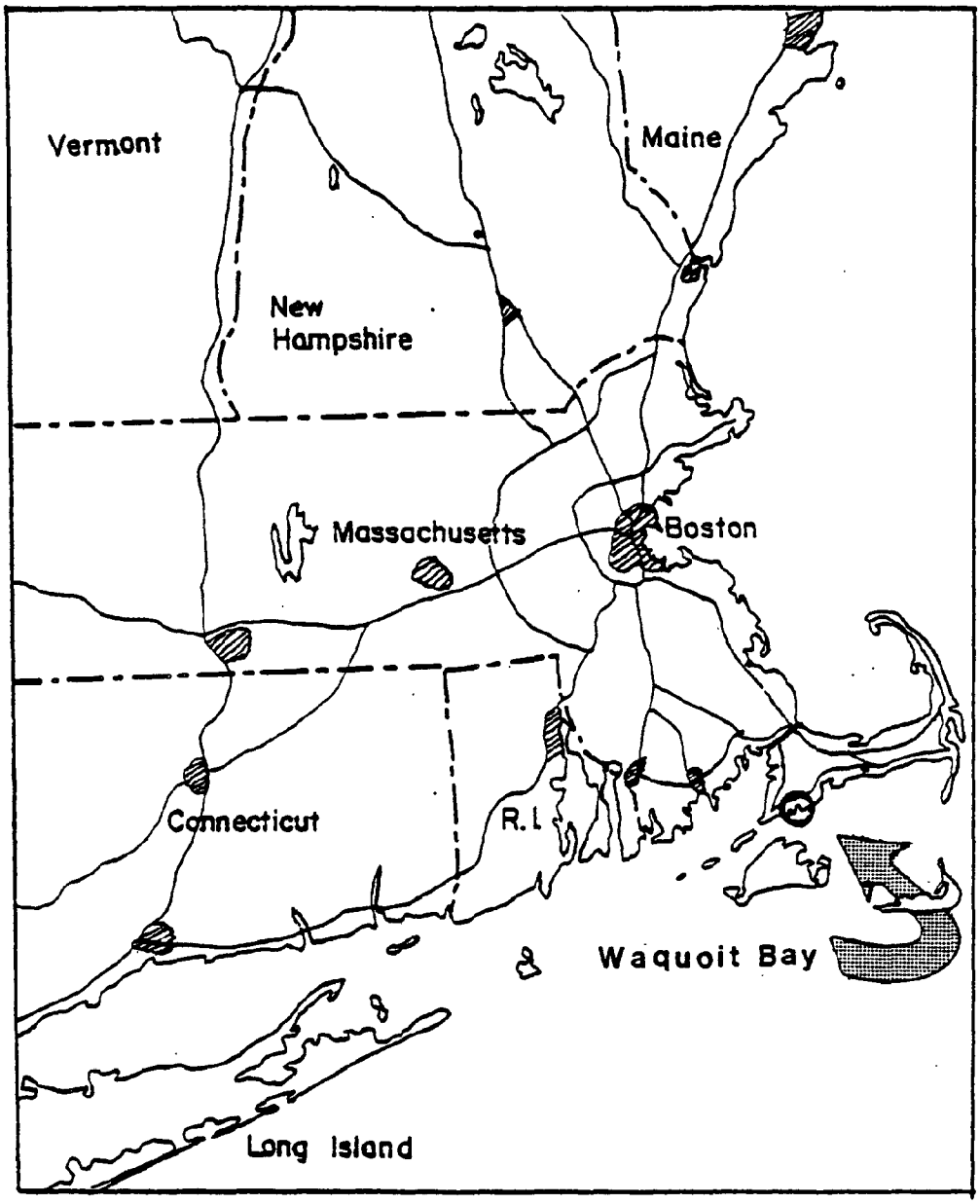
The adverse impacts of the proposed action would be loss of tax revenues and, in the case of the Swift Estate, loss of potentially developable property. However, the approximately $2,500-4,000 paid in local taxes each year would be offset by additional income from local services to researchers, educational groups, etc., attracted to the site.

No irreversible or irretrievable commitments of resources would occur with the preferred alternative other than those resources committed to facilities construction (e.g., Swift Estate renovations, simple boat dock, interpretive trail with boardwalk, etc.) in support of the management plan goals, objectives, and policies.

The overall and major impacts of designation of the proposed Waquoit Bay National Estuarine Sanctuary are expected to be positive through better scientific and public understanding of the estuary and its resources. The proposed national estuarine sanctuary does not conflict with existing commercial or recreational uses of Waquoit Bay. Without national estuarine sanctuary designation, Waquoit Bay would not be an area dedicated specifically and permanently for research and education. However, with sanctuary designation, present uses of the site, including hunting and other recreational uses where currently allowed, would continue. Furthermore, designation of the Sanctuary, acquisition of the Swift Estate and development of a Sanctuary headquarters from which both research and education programs can be administered, would provide improved public access to the Bay for recreation and enjoyment.

Figure 1

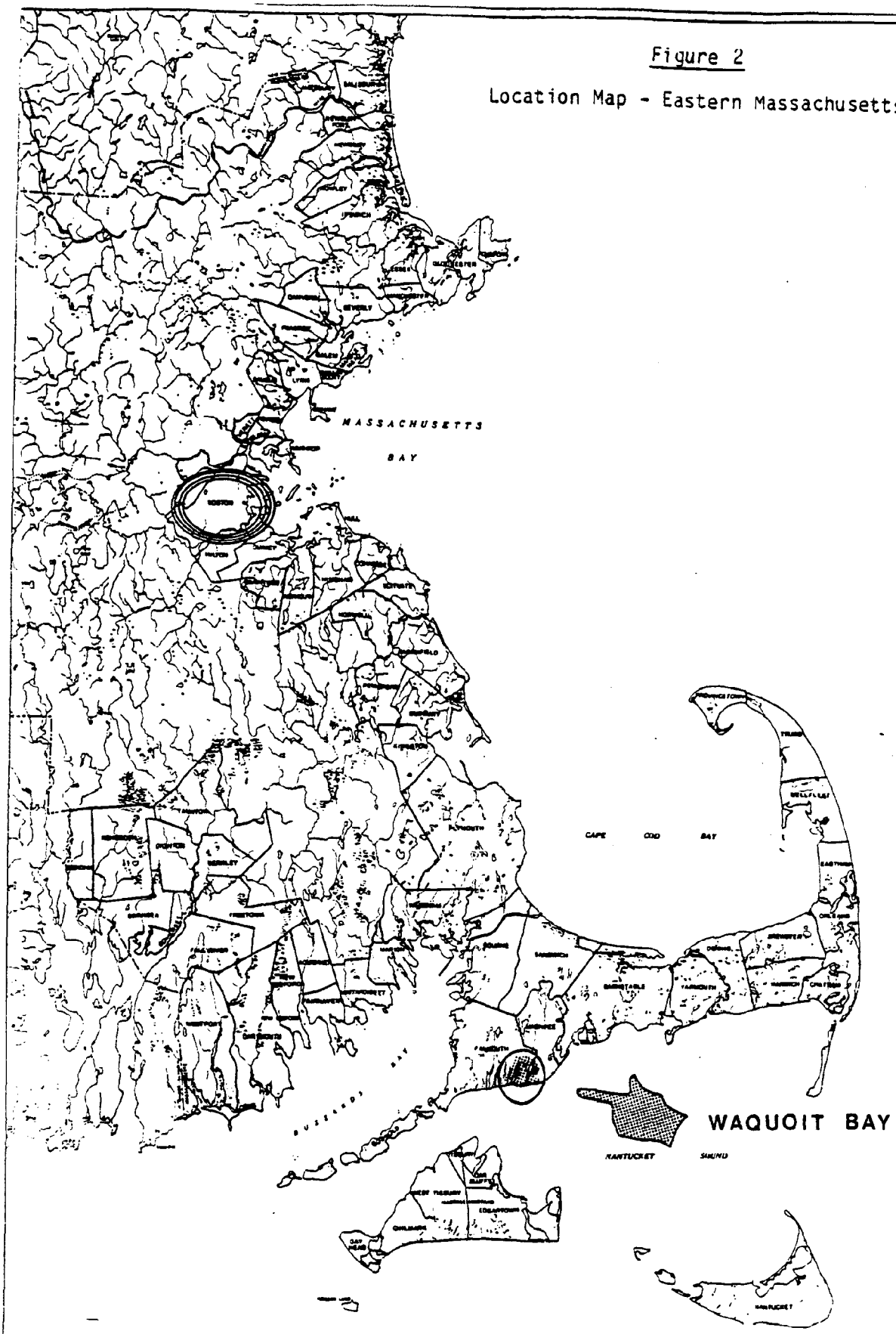
Location Map - New England



Regional Location Map

Figure 2

Location Map - Eastern Massachusetts



EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
COASTAL ZONE MANAGEMENT PROGRAM

PART I: PURPOSE OF AND NEED FOR ACTION

A. National Estuarine Sanctuary Program

1. Federal Legislation/Authority

In response to intense pressures on the coastal resources of the United States, Congress enacted the Coastal Zone Management Act (CZMA), which was signed into law on October 27, 1972, and amended in 1976 and 1980. The CZMA authorized a Federal grant-in-aid and assistance program to be administered by the Secretary of Commerce, who in turn has delegated this responsibility to the Office of Ocean and Coastal Resource Management, National Ocean Service, in the National Oceanic and Atmospheric Administration (NOAA).

The CZMA affirms a national interest in the effective protection and development of the Nation's coastal zone, and provides financial and technical assistance to coastal States (including those bordering on the Atlantic and Pacific Oceans, the Gulf of Mexico, and the Great Lakes) and U.S. territories to develop and implement State coastal zone management programs. The Act established a variety of grant-in-aid programs to such States for purposes of:

-- developing coastal zone management programs (Sec. 305);

-- implementing and administering coastal management programs that receive Federal approval (Sec. 306);

-- avoiding or minimizing adverse environmental, social, and economic impacts resulting from coastal energy activities (Sec. 309);

-- coordinating, studying, planning, and implementing interstate coastal management activities and programs (Sec. 309);

-- conducting research, study, and training programs to provide scientific and technical support to State coastal zone management programs (Sec. 310); and

-- acquiring land for estuarine sanctuaries and island preservation (Sec. 315).

2. National Estuarine Sanctuary Program

Section 315 of the CZMA established the National Estuarine Sanctuary Program to provide matching Federal financial assistance to States to acquire, develop, and operate estuarine areas as natural field laboratories, so that researchers and students may be provided the opportunity to examine the ecological relationships within the areas over time. This information will then be used to develop a basis for improved decision-making and resource management strategies. Section 315 provides a maximum of $3 million in Federal funds, to be matched by an equivalent amount from the State, to acquire and manage lands for each sanctuary. The regulations for implementation of the Estuarine Sanctuary Program are found at 15 CFR Part 921 (Appendix 1).

The mission of the National Estuarine Sanctuary Program is the establishment and management, through Federal-state cooperation of a national system of estuarine sanctuaries representative of the various regions and estuarine types in the United States to provide opportunities for long-term research, education, and interpretation. The goals of the Program for carrying out this mission are:

(1) Enhance resource protection by implementing a long-term management plan tailored to the site's specific resources;

(2) Provide opportunities for long-term research and educational programs in estuarine areas to develop information for improved coastal decisionmaking;

(3) Enhance public awareness and understanding of the estuarine environment through resource interpretive programs; and

(4) Promote Federal-state cooperative efforts in managing estuarine areas.

While the primary purposes of national estuarine sanctuaries are research and educational, multiple use of estuarine sanctuaries by the general public is encouraged to the extent that such usage is compatible with the sanctuary's character as a natural field laboratory. Such uses generally include low-intensity recreation, such as boating, fishing, shellfishing, hunting, and wildlife photography or observation. Traditional activities such as commercial fishing and shellfishing may also be compatible uses.

3. Concept of Biogeographic Zones

To ensure that the National Estuarine Sanctuary System includes sites that adequately represent regional and ecological differences, the National Estuarine Sanctuary Program regulations establish a biogeographical classification scheme that reflects regional differences in biogeography and an estuarine typology system to ensure the inclusion of a variety of ecosystem types. The biogeographical classification scheme and estuarine typology system are presented in Appendix 1. Eleven biogeographic regions and twenty-seven (27) biogeographic sub-regions are identifed in the National Estuarine Sanctuary Program regulations. The proposed Waquoit Bay National Estuarine Sanctuary is representative of the Southern New England (Cape Cod to Sandy Hook) portion of the Virginia biogeographic region.

4. Existing National Estuarine Sanctuaries

Since 1974, the Office of Ocean and Coastal Resource Management has awarded grants to establish fifteen national estuarine sanctuaries. These include:

Sanctuary	Biogeographic Classification
South Slough Coos Bay, Oregon	Columbian
Sapelo Island McIntosh County, Georgia	Columbian

Sanctuary	Biogeographic Classification
Waimanu Valley Island of Hawaii, Hawaii	Insular
Rookery Bay Collier County, Florida	West Indian
Old Woman Creek Erie County, Ohio	Great Lakes
Apalachicola River/Bay Franklin County, Florida	Louisianian
Elkhorn Slough Monterey County, California	Californian
Padilla Bay Skagit County, Washington	Columbian
Narragansett Bay Newport County, Rhode Island	Virginian
Chesapeake Bay (2 components) Anne Arundel and Somerset Counties, Maryland	Virginian
Jobos Bay Puerto Rico	West Indian
Tijuana River San Diego County, California	Californian
Hudson River (4 components) Hudson River, New York	Virginian
Wells Wells, Maine	Acadian
North Carolina (4 components)	Virginian/Carolinian

5. Funding Types and Limits

The National Oceanic and Atmospheric Administration (NOAA) may provide financial assistance, not to exceed 50 percent of all actual costs to coastal states, to assist in the designation and operation of national estuarine sanctuaries. Three types of awards are available under the National Estuarine Sanctuary Program. The preacquisition award is for site selection and draft

management plan preparation. The total Federal share of the preacquisition award may not exceed $50,000, of which up to $10,000 may be used for site selection. The acquisition and development award is intended primarily for land acquisition and construction purposes. The operation and management award provides funds to assist in implementing the research, educational, and administrative programs detailed in the sanctuary management plan. Federal funds of up to $250,000, to be matched by the state, are available for the operation and management of the national estuarine sanctuary; with no more than $50,000 in Federal funds per annual award. At the conclusion of Federal financial assistance for operation and management, funding for the long-term operation of the sanctuary becomes the responsibility of the state. To stimulate high quality research within designated national estuarine sanctuaries, NOAA may also provide funds for research on a competitive basis to sanctuaries having an approved final management plan. The maximum total Federal funding per sanctuary is $3,000,000 for the preacquisition, acquisition and development, and operation and management awards. Federal funding provided by NOAA on a competitive basis for research in national estuarine sanctuaries is excluded from this total.

6. Federal Role in the Sanctuary After Designation

State performance during the term of the operation and management award will be evaluated annually by NOAA; and periodically in accordance with the provisions of Section 312 of the CZMA. Such an evaluation will be conducted to determine the state's compliance with the conditions of the award and overall progress in implementing the management plan. After Federal funding available to a state for sanctuary purposes has been exhausted, NOAA will begin a biennial review of the state's performance in managing the national estuarine sanctuary to ensure that the purposes for which the sanctuary was designated are still being maintained. Through such programmatic evaluations NOAA determines whether such a national estuarine sanctuary is meeting the mandate of section 315 of the Act, the national program goals and the policies established in the management plan.

B. Proposed Waquoit Bay National Estuarine Sanctuary

1. Background - Massachusetts' Site Selection Process and "Pre"-Acquisition

Massachusetts first established a program to study systematically its estuaries in 1963. This research effort was initiated as a result of a report of the Marine Fisheries Advisory Commission to the Governor of the Commonwealth in December 1960. The Commission stated:

> "The Commonwealth has only limited knowledge as to the physical conditions and productivity of its many harbors, bays, river mouths and other estuaries. As these serve as key areas of productivity for many species of marine organisms important to the commercial and recreation (sport fishing) industries, it would appear of paramount importance to initiate this basic survey as rapidly as possible.
>
> An additional factor lending further emphasis to the need for detailed studies is the rapid rate of change evident along much of the Massachusetts coastline involving the dredging of channels, construction of hurricane protection barriers, and filling of tidal marshland for commercial purposes. The Commission recognizes the urgent necessity of prompt investigation before such changes become irrevocable."

Since 1963, 17 major coastal bays and estuaries have been studied. These areas are representative of the entire Massachusetts coast both with respect to the physical and biological environment and to the extent of environmental impacts and alterations. A full explanation and discussion of this program is presented in the 1970 Transactions of the Thirty-Fifth North American Wildlife and Natural Resources Conference.

A scientific analysis of the results of the Massachusetts Estuarine Research Program was published in 1975. Using data from the Research Program, this study calculated certain indices to compare species abundance and diversity with environmental quality of a specific estuary.

Massachusetts has long had an interest in the National Estuarine Sanctuary Program. In 1974, the Massachusetts Coastal Zone Task Force met to discuss the possibility of applying for funds to establish a national estuarine sanctuary in the Commonwealth. By early 1975, a preliminary application for the North-South River estuary had been completed. However, this application was not submitted for consideration. A meeting was held on August 15, 1978 with officials of the then Federal Office of Coastal Zone Management (currently the Office of Ocean and Coastal Resource Management) and several members of the Massachusetts Coastal Zone Management Office staff. At this meeting the status of the National Estuarine Sanctuary Program and its potential application in Massachusetts were discussed. Officials at this meeting also considered possible candidates for sanctuary status as well as certain management issues such as use restrictions and research needs. After the meeting, a series of informal discussions and telephone conversations were conducted by Massachusetts CZM staff with other State officials, particularly within the Department of Environmental Management. The major estuarine areas considered by the Commonwealth as candidates for national estuarine sanctuary status included: Parker River/Essex Bay, North/South River, Weymouth Back River, Ellisville Harbor, Sandy Neck, and Waquoit Bay. The North/South River and Waquoit Bay were selected from among this group as the sites most likely to meet the requirements of the Federal National Estuarine Sanctuary Program and benefit from the research and education programs and the additional protection that national estuarine sanctuary designation would provide.

In 1979 the Commonwealth of Massachusetts designated Waquoit Bay as an Area of Critical Environmental Concern (ACEC) in accordance with Massachusetts General Laws Chapter 21(A) Section (2)(7). This ACEC designation followed an extensive public participation process during which major management issues for the area were addressed; during which and interest in national estuarine sanctuary status was expressed. The North/South River site, after additional evaluation and discussions with Federal officials, was determined to be not as compatible with the National Estuarine Sanctuary Program as the Waquoit Bay area.

Based on the results of the Estuarine Research program and the meetings held concerning the National Estuarine Sanctuary Program, and after a thorough review of alternative sites within the coastal area of the Commonwealth, Massachusetts recommended Waquoit Bay for designation as a national estuarine sanctuary in July 1981. At this same time the Secretary of the Massachusetts Executive Office of Environmental Affairs applied for "preacquisition" Federal

financial assistance. The area proposed in July 1981 by the Commonwealth included the land and water areas commonly known as Waquoit Bay, Washburn Island, South Cape Beach, Sage Lot Pond, Flat Pond, Hamblin Pond, Jehu Pond, and the major marshes immediately adjacent to these areas. In September 1981 NOAA awarded, and the State matched, a "pre-acquisition" Federal financial assistance award for further evaluation of the site, the collection of information necessary for management plan and draft environmental impact statement preparation, and preliminary acquisition activities. During the period of this preacquisition phase, a more detailed series of discussions were conducted among MCZM staff, DEM planners and the DEM Commissioner. These discussions, and the subsequent acquisitions discussed below, led the Commonwealth of Massachusetts to apply for Federal funds for acquisition and development of Waquoit Bay as a national estuarine sanctuary.

In December 1982, South Cape Beach was acquired by the Commonwealth. South Cape Beach is a barrier beach/salt pond/marsh/upland complex located immediately to the east of the inlet to Waquoit Bay from Nantucket Sound. South Cape Beach, located entirely within the Town of Mashpee, was acquired with the Town of Mashpee's cooperation and is now being operated as a state park for low-intensity recreation.

In June 1983, the Commonwealth acquired an additional part of the proposed Sanctuary, Washburn Island. Washburn Island, located in the Town of Falmouth west of the inlet to Waquoit Bay, essentially forms the western border of Waquoit Bay. It is a barrier island composed of upland, marsh, a small salt pond, and a dune/beach system at the southern end bordering on Nantucket Sound. Upon acquisition by the Commonwealth, Washburn Island was made part of the South Cape Beach State Park and will be managed for limited use low-intensity recreation.

The Commonwealth of Massachusetts has now submitted an application to NOAA to acquire and develop a national estuarine sanctuary in an area consistent with its 1981 pre-acquisition proposal. Although much of the upland and marsh areas of the proposed Sanctuary are now under State control as a result of the Commonwealth's acquisition of South Cape Beach and Washburn Island, the Commonwealth is requesting Federal funds for the purpose of: (1) acquiring the wetlands, waters, and uplands of the Swift estate at the head of Waquoit Bay and developing a sanctuary visitors' center with support facilities for the sanctuary research and education programs; (2) acquiring a fee simple, or less than fee simple (e.g., conservation easement, access rights for research and education purposes, etc.), property interest in the marsh areas adjacent to Hamblin and Jehu Ponds; and (3) the construction of necessary support facilities and equipment for sanctuary research and education (e.g., docks, boardwalks, interpretive exhibits, shelters, etc.). Other than the Swift estate and the marsh areas surrounding Hamblin and Jehu Ponds, all other land and water areas within the proposed boundaries of the Sanctuary are in public ownership.

The Waquoit Bay National Estuarine Sanctuary, if established, would represent a major subcategory within the northern one-third of the Virginian biogeographic region. In addition, the Sanctuary would be located within the transitional border between the Virginian and Acadian biogeographic regions.

This proposed Sanctuary would contain approximately 2,232 acres of marsh, open water, and uplands. The sanctuary site is an estuarine embayment, which connects a series of tidal ponds, and represents the last remaining large unaltered estuary on the south shore of Cape Cod. The biota is primarily temperate with some boreal representatives. The area is characterized by a high species diversity due to the intermingling of cold water species from the Gulf of Maine and warm water species from the mid-Atlantic. The proposed Sanctury would be used primarily for research and education purposes, especially to provide information useful for coastal zone management decisionmaking. Multiple and traditional uses would be allowed to the extent that they are compatible with the proposed sanctuary's research and educational programs.

NOAA and the Commonwealth of Massachusetts are in the process of developing a memorandum of understanding (MOU), which emphasizes the significance of establishing a National Estuarine Sanctuary, and recognizes the long-term commitment of the Commonwealth and Federal governments to management of the Waquoit Bay proposal area in accordance with agreed upon program goals.

PART II. ALTERNATIVES (INCLUDING THE PROPOSED ACTION)

The action under consideration by NOAA is a proposal from the Commonwealth of Massachusetts to establish a Waquoit Bay National Estuarine Sanctuary consisting of the land and water areas encompassed by the Waquoit Bay estuarine system in Barnstable County (Cape Cod), Massachusetts.

Although this project is called the Waquoit Bay National Estuarine "Sanctuary", it will be managed and operated under a policy of multiple use, particularly with respect to the traditional uses of the areas. The primary objective of the proposed Waquoit Bay National Estuarine Sanctuary is to provide protection from developmental disturbances so the area may be used for long-term research and educational purposes. Although primary emphasis will be on the use of the Sanctuary for estuarine studies, other traditional water use activities may be compatible with the Sanctuary's character as a natural field laboratory. Such compatible uses are reasonable levels of hunting, fishing, trapping, boating and wildlife observation. These uses will continue subject to existing State laws.

A. Preferred Alternative

1. Boundaries and Acquisition Plan

a. Biographic Classification of the Proposed Sanctuary

Waquoit Bay is within the Virginian province of the National Estuarine Sanctuary biogeographic classification scheme set forth in the National Estuarine Sanctuary Program Regulations; 15 CFR Part 921, (Appendix 1). However, because Cape Cod is the dividing line between the Virginian and Acadian biographic regions, Waquoit Bay represents an area of biogeographical transition. High species diversity characterizes the area due to the intermingling of cold water species from the Gulf of Maine and warm water species from the mid-Atlantic. The Virginian classification includes estuaries found along the Middle Atlantic coast from Cape Cod to Cape Hatteras. These estuaries are characterized by lowland streams, coastal marshes and muddy or sandy bottoms. The biota is predominantly temperate, but there are regular boreal representatives.

b. General Description of Proposed Sanctuary

Waquoit Bay is located in the towns of Falmouth and Mashpee in Barnstable County (Cape Cod), Massachusetts. The Bay is adjacent to Nantucket Sound on the south side of Cape Cod.

The boundary proposed for the Waquoit Bay National Estuarine Sanctuary includes all of Waquoit Bay; Jehu, Hamblin, Caleb, Sage Lot and Flat Ponds; the Great and Little Rivers; and portions of Quashnet River. Also included in the boundary for the proposed Sanctuary are the adjacent uplands on Washburn Island, South Cape Beach State Park (excluding approximately 30 acres of Town of Mashpee inholdings), and portions of the Swift Estate at the northern end of the Bay. Figure 3 shows the proposed boundary. This boundary includes the key land and water areas of the Waquoit Bay estuary.

The boundary of the proposed Waquoit Bay National Estuarine Sanctuary largely reflects the boundary developed for the State designated Waquoit Bay Area of Critical Environmental Concern (see Figure 3 and Figure 7). This latter designation followed an extensive public participation process during which major management issues (e.g., shellfishing, recreational boating, and commercial interests) were addressed.

There are several large segments of publicly owned land within the proposed Sanctuary. These include all of Washburn Island and the holdings of the Massachuetts Department of Environmental Management on South Cape Beach. Further, all subtidal lands are public in Massachusetts and belong to the Commonwealth. All of the land below the mean low tide line within the proposed boundaries would be included within the Sanctuary.

c. Land under Waterbodies: Waquoit Bay; Hamblin, Jehu, Sage Lot, and Caleb Ponds; Great, Little and Lower Quashnet Rivers

Subtidal lands proposed for inclusion in the Sanctuary are those under Waquoit Bay itself; Hamblin, Jehu, Sage Lot, and Caleb Ponds; the Great and Little Rivers; and a portion of the lower Quashnet River. The table below provides morphometric data on these waterbodies. As the table indicates, there are extensive salt marsh areas around Hamblin and Jehu Ponds. These are discussed in further detail below. Current management and regulation of subtidal areas is principally under the Massachusetts Wetlands Protection Act and Chapter 91, the Waterways Licensing Process. (See pages 28-30).

Table 1 MORPHOMETRIC DATA ON WAQUOIT BAY AND CONNECTING WATERBODIES

Sub-System	Max Length (mi.)	Max Width (mi.)	Max Depth (ft.)	Mean Depth (ft.)	Water Area (acres)	Marsh Area (acres)	Upland Area (acres)	Shoreline Length (mi.)
Waquoit Bay	2.6	1.1	9.0	2.7	942	6		7.5
Quashnet River	1.1	0.1	7.6	Unk	42	6		2.8
Hamblin Pond/ Little River	1.7	0.4	5.0	2.0	141	217		5.3
Jehu Pond/ Great River	2.3	0.3	7.6	Unk	172	95		7.6
Washburn Island						32.5	297.5	5.9
South Cape Beach						88.5	311.5	2.5
Swift Estate (proposed for acquisition)						2	10	.2
Hamblin/Jehu Pond Marshes						193		

(Modified from Curley, et. al., 1971)

d. South Cape Beach

South Cape Beach, 432 acres of barrier beach, salt ponds, salt marsh and uplands, was acquired by the Commonwealth in December of 1982. The property, located entirely in Mashpee, is being operated as a State park by the Department of Environmental Management's Forest and Parks Division. A managment plan is being developed based on an agreement between the Commonwealth and the Town of Mashpee which authorized taking of the land by eminent domain. That agreement of June 29, 1981 (see Appendix 2) stipulates that the development and use of the park shall be limited to "bathing, sunning, hiking, fishing, nature interpretation, non-motorized biking, and associated passive enjoyment through recreational use consistent with the fragile ecology of the site...". Overnight camping is expressly forbidden. Off-road vehicles may be used only by the elderly or disabled and are limited in number and routes. Permits may be issued for a maximum of six such vehicles during any period and are intended only to provide access for fishing. Public parking is limited to a total of 400 vehicles in "several landscaped sites".

It is further required that "all park facilities will be designed, sited and maintained so that they do not harm the natural and scenic qualities of the area..." and that the Commonwealth "will manage the fragile wetland, dune and upland areas of the site to prevent erosion and to preserve critical habitat and the area's natural scenic qualities." Clearly the agreement intends a limit to the recreational usage of South Cape Beach, and requires that usage to be of a passive nature.

The agreement establishes a South Cape Beach State Park Advisory Committee comprised of the following:

Voting Members:

8 representatives appointed by the Mashpee Board of Selectmen

1 representative each to be appointed by the Selectmen of Falmouth, Barnstable, and Sandwich

Ex-officio Members

1 representative of the Massachusetts Coastal Zone Management Office

1 representative of the Massachusetts Department of Fisheries, Wildlife and Recreational Vehicles

The State Representative of the Third Barnstable Representative District

The State Senator from the Cape and Islands Senatorial District

The Committee meets monthly to review and advise on matters of park management and operations, rules and regulations, and design and plan review. A Park Superintendent and staff have been appointed for South Cape Beach and they work closely with the South Cape Beach State Park Advisory Committee. The proposal for incorporation of South Cape Beach State Park into a national estuarine sanctuary makes no suggestion of change in this existing structure It is intended that the Sanctuary Manager would consult with both the Park Superintendent and the Advisory Committee on any contemplated actions at South Cape Beach.

Included within the present bounds of South Cape Beach State Park is an area that eventually will be deeded to the Town of Mashpee for use as a town recreational beach. This parcel is approximately 30 acres in size and has roughly 1700 feet of frontage on Nantucket Sound. There is also a 10 acre parcel bordering on Waquoit Bay and the Great River that will be deeded to Mashpee for the possible siting of a municipal boat launching facility. It is proposed that these areas not be included in the Sanctuary initially. At some point subsequent to designation, the Sanctuary Manager will consult with the Board of Selectmen of the Town of Mashpee, or their Town Meeting, to ascertain whether or not it is appropriate to have these parcels incorporated into the Sanctuary.

Within the 400+ acres of South Cape Beach State Park are two salt ponds (Sage Lot and Flat Ponds), 88.5 acres of salt marsh and 104 acres of barrier beach. The barrier beach has been so designated by the Massachusetts Office of Coastal Zone Management for regulation under the Wetlands Protection Act and under a Massachusetts Executive Order (#181), which prohibits use of State funds for growth and development of such barriers. The barrier has also been designated under regulations of the Federal Coastal Barrier Resources Act which limit Federal expenditures encouraging growth on undeveloped barriers.

e. Washburn Island

Washburn Island, located in the Town of Falmouth, makes up the western border of Waquoit Bay. Comprised of some 330 acres, this barrier island includes a sandy barrier beach and dune system at the southern end bordering on Nantucket Sound. This barrier is a western extension of that on South Cape Beach. North from the barrier extend acres of oak and pine forests, salt marshes and salt ponds. This parcel was acquired by the Commonwealth in June 1983 and has become part of the State's forest and park system. It is presently managed in conjunction with South Cape Beach State Park by the Department of Environmental Management through the Forests and Parks Division. A Preliminary Management Plan has been developed by the Department of Environmental Management which recommends that the island be managed for limited use, primarily passive recreation such as hiking, nature study, etc. Access to the island is by boat only, and there is no intention of constructing any sort of vehicle connector. Wooden docks are proposed to accommodate visitors and staff. Trails and interpretive displays are being planned and developed.

Consideration is being given to tent camping on the eastern side of the island. In the past, despite being private property, there has been a tradition of campers on the island. This uncontrolled activity has led to some defiling of parts of the site. There has also been a serious concern for fire. It is felt that, under strict control and in specifically delineated areas, limited camping could exist without these problems in the future; however, this will require review and currently should be considered an unresolved issue.

Comfort stations are proposed as are strategically located boardwalks and scenic overlooks. Unsupervised swimming would be allowed on the southern beach facing Nantucket Sound, and fishing can take place at the mouth of the Bay and at the western end of the barrier at the mouth of Eel River.

Least terns have been observed nesting on the barrier beach on Washburn Island. To protect this significant resource, portions of the beach may be closed during portions of the mid-summer nesting season. Boardwalk design and location will facilitate this protective management activity.

The barrier beach at the southern end of Washburn Island has been identified by the Massachusetts Coastal Zone Management Inventory for regulation under the Massachusetts Wetlands Protection Act and Massachusetts Executive Order - limiting State support for growth and development on such resource areas. The entire island has been designated as an undeveloped barrier island under the regulations of the Federal Coastal Barrier Resources Act.

f. The Swift Estate

Located in Falmouth on a bluff thirty feet above the water at the northern end of Waquoit Bay is the so-called Swift Estate (Figure 6). The total property consists of some 23 acres; the current owner has indicated willingness to part with parcels comprising approximately 16 acres. These parcels include a 100-year old, three story, 16-room Victorian mansion and a large carriage house. The buildings have not been occupied for many years and have been visited by vandals and small animals. They appear structually sound, however, and, with considerable renovation, are proposed as the central facility for the Waquoit Bay National Estuarine Sanctuary. The parcel which includes the buildings is comprised of approximately seven acres. The second parcel lies near sea level and includes a small barrier beach fronting a one-acre salt pond and just over two acres of salt marsh. A small amount of uplands forms the border for this area. Access to the Swift property is from Route 28 to the north and the waters of Waquoit Bay to the south.

The initial application for funding will be to acquire this property and to renovate the structures. An investigation will be made into naming the site to the List of Historic Buildings and applying for supplemental funding for historic preservation. The intent will be to restore the exterior to its former splendor as a Victorian mansion while turning the interior into a multiple use facility including a Sanctuary office, library, meeting rooms, quarters for the Sanctuary Manager, dormitories for researchers, etc. The carriage house would be used for equipment storage, workshops and, as funds permit, basic wet and dry laboratory facilities. The Commonwealth has initiated an appraisal of the property and negotiations with the owner.

g. Marshes around Hamblin and Jehu Ponds

Surrounding these two ponds in both Falmouth and Mashpee are sizeable salt marsh areas (see Figure 11 for marsh location and sizes). Virtually all of these marshes are in private ownership. However, the Commonwealth has adequate authority to ensure major activities may not be undertaken in any of the salt marsh areas that would have a significant adverse impact on the estuarine resources of the Sanctuary. As a result, it is not anticipated that the Commonwealth would consider exercising its power of eminant domain in these areas.

The marshes presently are protected from development by the Wetlands Protection Act as described on pages 28-29. The regulations to this Act are administered locally by Conservation Commissions and prohibit activities that will destroy the marsh or impair its productivity. The Wetlands Restriction Act has been implemented to protect the marshes in the Town of Falmouth only. The Act establishes a list of activities that which may or may not be allowed in the marsh, much in the nature of a zoning overlay. This program has not yet been applied to the marshes in the Town of Mashpee but the area is a priority for wetland restriction in the near future.

In addition to their protection, guaranteed access to these marshes for research or educational purposes is considered important to Sanctuary operation. The fragile nature of the marshes precludes wide public access, but assured limited access is important for both research and interpretative activities. As a result, following Federal approval of the proposed Federal financial assistance award for acquisition and development, it is the intention of the Commonwealth to approach owners to ascertain their interests in donation, sale, or voluntary restriction of or easements over these parcels. Avenues of tax abatement or exemption will be investigated to make such actions as attractive as possible. Every effort will be made to pursue these actions only with willing participants.

Figure 3

Proposed Boundary for the Waquoit Bay
National Estuarine Sanctuary (Preferred Alternative)

Figure 4
South Cape Beach
(Master Plan -
Massachusetts Department
of Environmental Management)

Figure 5

Washburn Island
(Preliminary Master Plan -
Massachusetts Department
of Environmental Management)

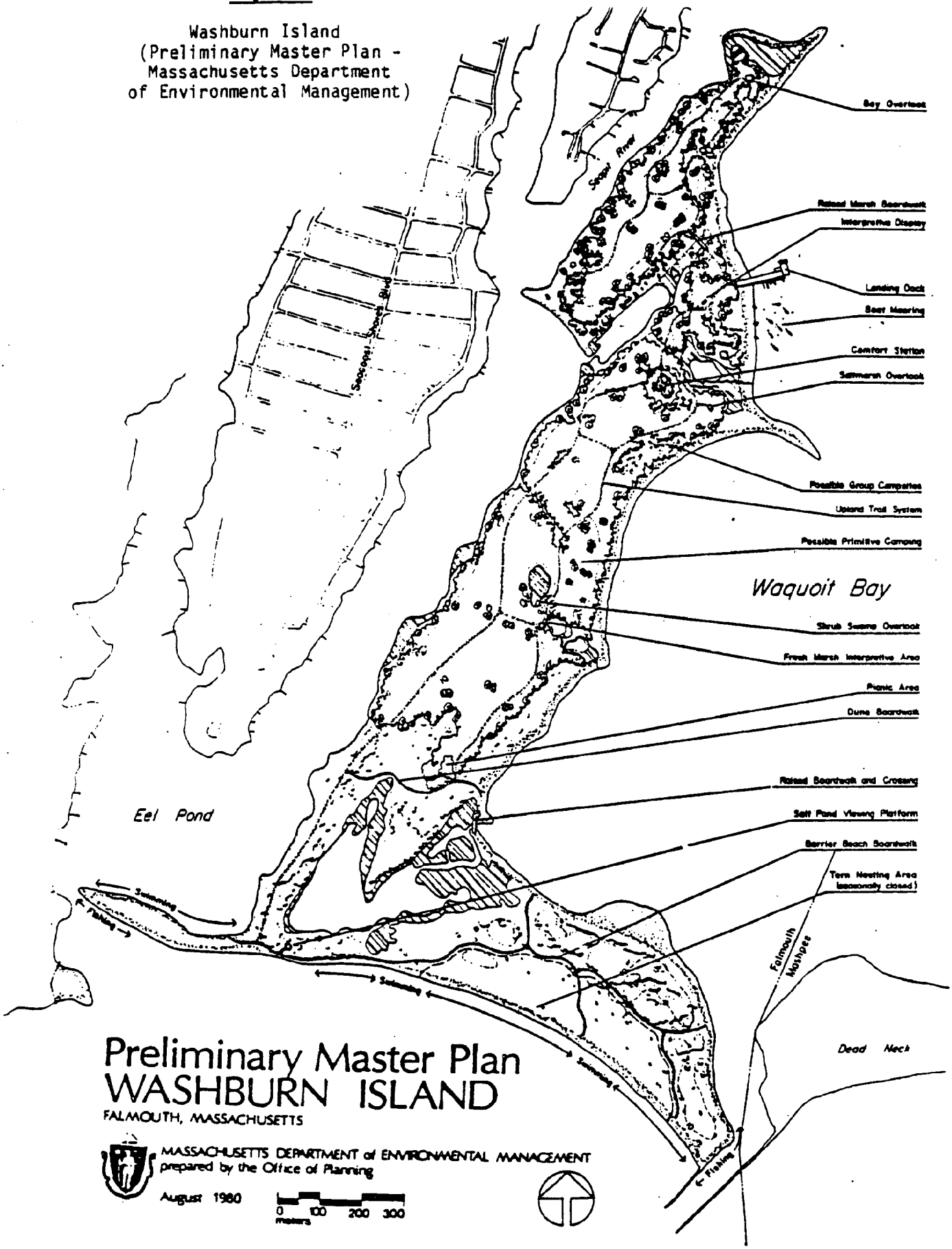


Figure 6

Swift Estate (Detail)

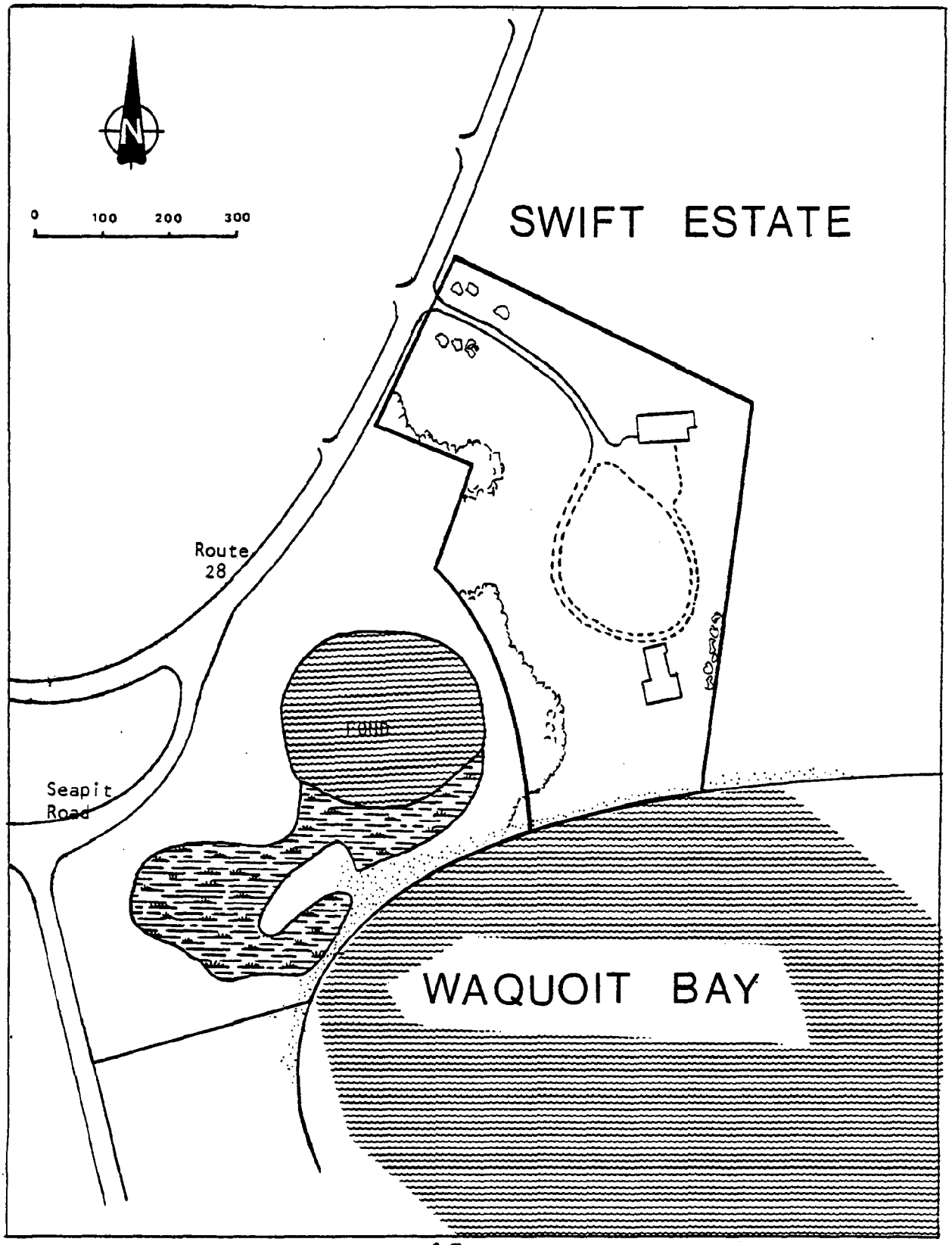


Figure 7

Waquoit Bay Area of Critical Environmental Concern

Figure 8

Barrier Beaches within the Proposed Sanctuary Boundary

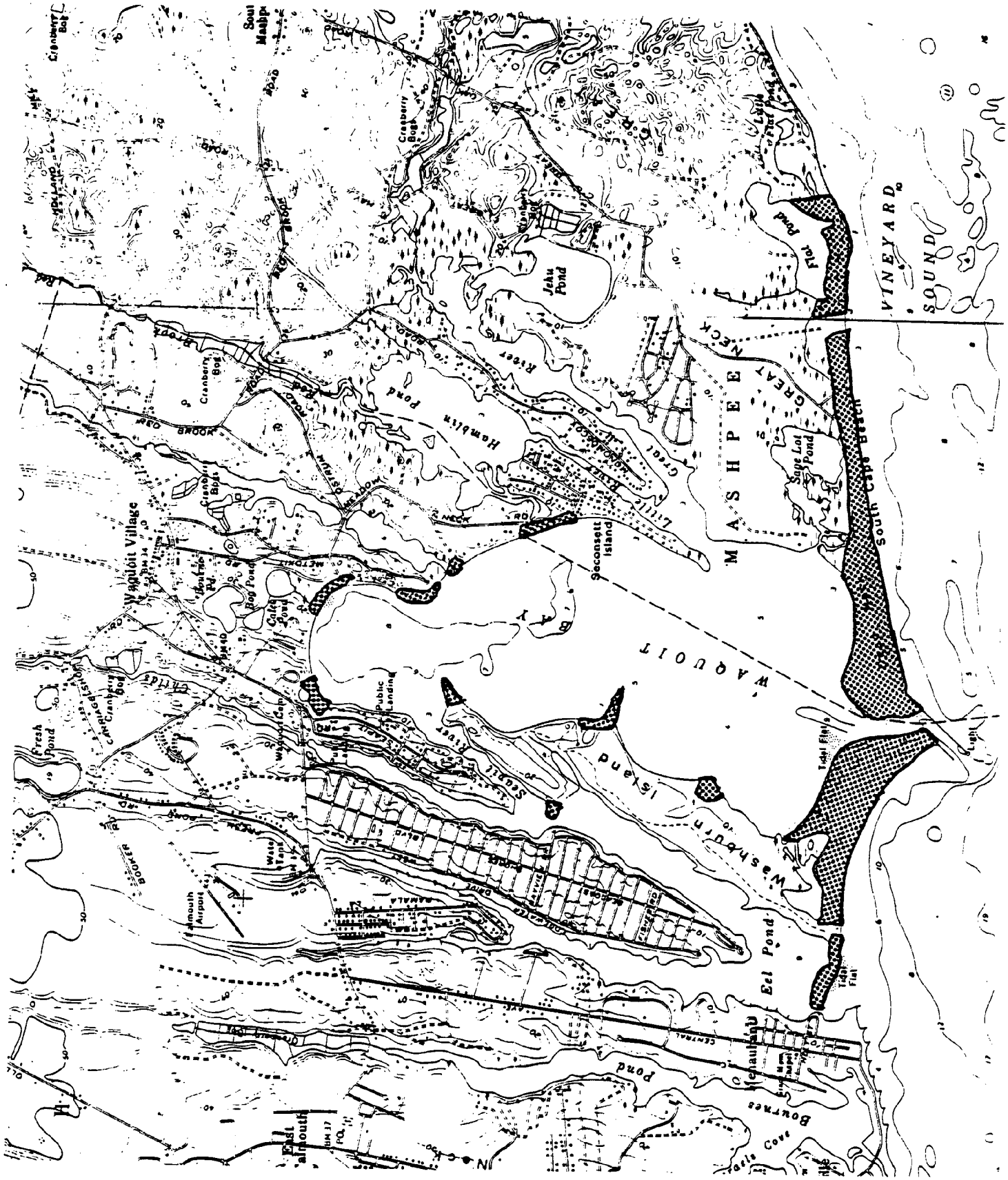


Figure 9

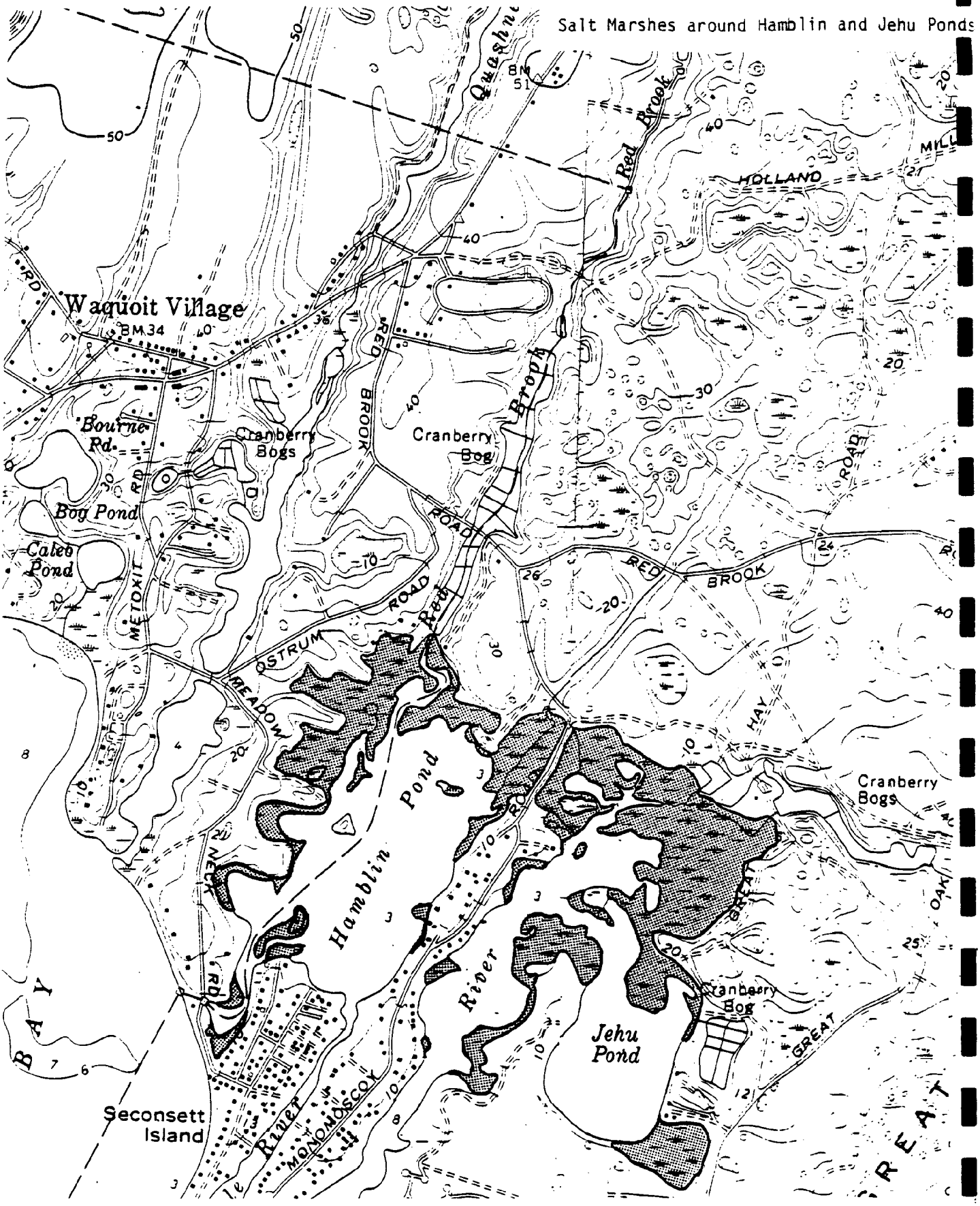
Upland and Marsh Area within the Proposed Sanctuary Boundary

Figure 10

Salt Marshes Over One-Half Acre Within the Waquoit Bay Area

Figure 11

Salt Marshes around Hamblin and Jehu Ponds



2. Administration, or Management Structure

a. Sanctuary Management Goals

The primay goals for establishing the Waquoit Bay National Estuarine Sanctuary are:

- To establish and manage the area within the boundaries of the Waquoit Bay National Estuarine Sanctuary as a natural field laboratory. To protect the natural resources of the wetlands, transitional areas, and adjacent uplands. To conduct and facilitate both short- and long-term estuarine research, education, and interpretation.

- To protect research sites and make them available for continuous future study of the natural processes and ecological relationships shaping and sustaining the estuarine system.

- To gather and distribute information on estuarine ecosystems that is essential to sound decisions regarding the management of coastal resources.

- To provide a focal point for educational activities that increase the public's awareness and understanding of estuarine ecosystems, man's effects on them, and their importance to the state and the nation.

- To promote cooperative management among Federal, State and municipal agencies to ensure that the short- and long-term uses of the Sanctuary contribute to carrying out Sanctuary goals, policies and management objectives as articulated in this Sanctuary Management Plan.

- To provide for controlled multiple use of the Sanctuary to allow for the continuation of existing low intensity recreational uses that are presently permitted, including fish and wildlife recreation (e.g. hunting, fishing, wildlife observation) and boating, which are compatible with Sanctuary's character as a natural field laboratory.

b. Relationship with existing administrative programs in Waquoit Bay and Statewide

Administration of the Waquoit Bay National Estuarine Sanctuary will be under the direction of the Massachusetts Department of Environmental Management (DEM). DEM presently manages almost 250,000 acres statewide as one of the largest and most successful park systems in the country. As the Commonwealth's principal holder of land for environmental and conservation purposes, DEM is the bestequipped State agency to manage any new properties acquired as part of the Sanctuary designation. In addition, DEM's existing interpretive program will provide the foundation for the planned educational activities sponsored by the Sanctuary. The Park Supervisor and staff will continue supervisory and enforcement roles within South Cape Beach State Park and on Washburn Island.

Close coordination between the Park Supervisor and the Sanctuary Manager is planned in order to avoid conflicts or duplication of effort.

A careful review of existing local, State, and Federal laws and regulations pertaining to resource management and land use which apply to the area proposed for inclusion within the boundaries of the Waquoit Bay National Estuarine Sanctuary indicate that they provide a high degree of protection. Therefore, other than on any new properties acquired as a part of the designation of the Sanctuary, the Commonwealth anticipates that no new regulations will be necessary. Management of the Bay and other water bodies, South Cape Beach State Park and Washburn Island will continue under the programs currently in place. If any new properties are acquired to become part of the Sanctuary, management plans will be developed to cover those parcels with the advice and assistance of the Sanctuary Advisory Committee discussed below.

Initial operation and management funding will be provided by the Federal National Estuarine Sanctuary Program, and will be matched by the Commonwealth of Massachusetts. Over a period of years, the funding burden will shift to the Commonwealth. There will be an attempt to make the Sanctuary's administration, research program and education program as self-sufficient as possible through the development of endowment funds for research and education; grants for specific activities or for general operational and administrative activities; and donations and gifts for restricted or unrestricted purposes.

c. Proposed Sanctuary Staff

The Sanctuary Manager will be the principal administrator of the Sanctuary and will be responsible for ensuring that the policies contained in the Sanctuary Management plan are followed. This individual will be employed and supervised by the Department of Environmental Management and will be responsible for the following activities:

i. General administration of the Sanctuary including the preparation of required State, Federal, and other grant applications, budgets, reports, and management of any necessary records.

ii. Representation of the Sanctuary program and policies in public hearings and meetings where appropriate.

iii. Implementation of the Sanctuary research program, with the advice and assistance of the Research Advisory Committee. This will include coordination of all research activities proposed for and conducted within the Sanctuary boundaries.

iv. Implementation of the Sanctuary education program, with the advice and assistance of the Educational Advisory Committee. This will include coordination of on-site and off-site interpretive activities, preparation, publication and distribution of brochures, reports, newsletters, slide shows and other forms of eduational material.

v. Responsibility for upkeep of the building and grounds at the Sanctuary headquarters.

vi. Supervision of Sanctuary staff and volunteer workers involved in activities of the Sanctuary.

vii. Coordination with the Federal National Estuarine Sanctuary Program.

The Sanctuary Manager position will require a background in administration of similar or related programs. In addition, experience in conducting estuarine research or in the administration of research programs will be necessary. A background in environmental education or in the administration of such programs would also be useful.

It is expected that a clerical assistant to the Manager will be needed. This individual will perform routine secretarial, clerical and office management functions.

As activities and programs develop at the Waquoit Bay National Estuarine Sanctuary, it may be necessary to consider employing a Research Director and/or an Education Director.

It is intended that supervisory, enforcement and interpretive responsibilities at South Cape Beach State Park and on Washburn Island will remain as they are presently structured. The Park Supervisor will continue to assume these responsibilities on park land; only at the Sanctuary headquarters will the Sanctuary Manager have responsibility for building and grounds supervision. As is discussed in the section on Education Program and Policies below, it is intended that the educational programs at the Sanctuary headquarters and off-site will be coordinated with the interpretive programs at South Cape Beach State Park and Washburn Island.

d. Advisory Committee

In order to provide for effective coordination and cooperation among all interests involved with Sanctuary programs, a Sanctuary Advisory Committee will be established. A group of eleven members will be appointed to this Committee by the Secretary of Environmental Affairs. Representatives of the following interest groups shall be included in the membership:

i. The Board of Selectmen of the Town of Falmouth

ii. The Board of Selectmen of the Town of Mashpee

iii. The Cape Cod Planning and Economic Development Commission

iv. The South Cape Beach State Park Advisory Committee

v. The Commissioner of the Massachusetts Department of Fisheries, Wildlife and Recreational Vehicles

vi. The Director of the Massachusetts Office of Coastal Zone Management

vii. The scientific community

viii. The education community

ix. Environmental interest groups

x. Hunting, fishing, shellfishing interest groups

xi. Boating, waterways, marina interest groups

Representatives will be nominated to the Secretary of Environmental Affairs for one year appointments with no limit on the number of reappointments. A representative of NOAA will be included as an ex-officio, non-voting, member.

The activities of the Sanctuary Advisory Committee will include the following:

i. Advise the Department of Environmental Management and the Sanctuary Management on matters of policy relating to planning for and operation of the Sanctuary

ii. Appoint the members of the Research and Educational Advisory Committees

iii. Assist in seeking support for the Research and Educational Programs and other financial matters

iv. Assist in the preparation of any periodic summary or annual reports on the operations of the Sanctuary

v. Represent the interests of the users of the Sanctuary, its neighbors, and the users of information and educational materials generated by the Sanctuary

The Committee shall conduct regular meetings, open to the public. The Sanctuary Manager or staff shall act as staff to the Committee.

e. Existing State Land-use Regulatory Programs affecting Waquoit Bay

i. Wetlands Protection Act

The Massachusetts Wetlands Protection Act (MGL C.131 s. 40) and the regulations that have been developed thereto require that no one shall remove, fill, dredge, or alter any coastal or freshwater wetland without a review by the local Conservation Commission to protect specific public interests stated in the Act. The definition of wetlands provided by the Act includes such resource areas as coastal banks, dunes, beaches, saltmarshes, land under water bodies and land subject to flooding. The Conservation Commission must hold an open hearing to determine whether the area of the impacts of the project

are significant to seven public interests, including:

- public or private water supply
- ground water supply
- flood control
- storm damage prevention
- prevention of pollution
- land containing shellfish
- fisheries

The Conservation Commission will then produce an Order of Conditions regulating the project so as to protect these interests.

Under the regulations governing activities in coastal sites, performance standards are set for projects proposed for various resource areas. For most work in a coastal bank; coastal beach; coastal dune; land under a salt pond; land containing shellfish; and banks of, or land under, the ocean, rivers, streams, ponds, or lakes that are part of an anadromous fish run, the standard is that a project shall have "no adverse effect" on the seven interests listed above. For saltmarshes, the standard is even more stringent, stating that a project "shall not destroy any portion of the salt marsh and shall not have an adverse effect on the productivity of the salt marsh".

Within an area that has been designated as an Area of Critical Environmental Concern (ACEC), such as Waquoit Bay, the performance standard for projects on land under the ocean and tidal flats is also established as "no adverse effect".

An exception to this is maintenance dredging of land under the ocean for navigation improvement. Such dredging must "minimize adverse effects using best available measures as defined by regulation" and may not expand on existing channels. Exemptions from the Act and its procedures are provided for work on land already in agricultural use and for approved mosquito control projects. A variance procedure does exist; however, it will be used only in rare and unusual cases to provide for instances of overwhelming public need.

ii. Wetlands Restriction Acts

There are two statutes under Massachusetts law which set restrictions on activities within wetlands; the Coastal Wetlands Restriction Act (MGL C.130 s.105) and the Inland Wetlands Restriction Act (MGL C.131 s.40A). Although these serve to protect different types of wetlands, generally they have the same format and procedures.

The statutes authorize the Commissioner of the Department of Environmental Management, following a public hearing and with the approval of the Board of Environmental Management, to restrict or prohibit major alterations of significant wetlands. The tool used is an "Order of Restriction", fashioned to affect

land use to promote public health, safety and welfare and to protect public and private property, wildlife and marine fisheries (the Inland Wetlands Restriction Act also provides protection to fisheries, water resources, flood plain areas, and agriculture). Ownership rights however, are not affected. The Order generally prohibits large scale alterations of wetlands such as filling, dredging and discharge of pollutants. Permitted activities include agriculture and aquaculture; building and maintenance of docks and piers; upkeep of existing roads, marine channels and structures; and construction and maintenance of temporary structures on pilings.

The Order of Restriction is recorded in the local Registry of Deeds, and a marginal notation is made either on the deed of a recorded parcel or the Land Court Certificate of a registered parcel. The effect of the restriction is much like a zoning overlay in that landowners are advised in advance of both allowed and prohibited activities. Lands subject to the Wetlands Restriction Acts are still subject to the provisions of the Wetlands Protection Act and other applicable laws and regulations.

Coastal beaches, coastal dunes, tide flats, and saltmarshes have been restricted under the Coastal Wetlands Restriction Act in the Town of Falmouth. The Inland Wetlands Restriction Act has not been implemented in either Falmouth or Mashpee. At this point the Coastal Wetlands Restriction Act has not been implemented in Mashpee, the only town in Barnstable County where this has not been done. The coastal sections of Mashpee remain a high priority for restriction when staff and funding levels allow. It is the intent of the Commonwealth to complete these restrictions within the next two years.

iii. Chapter 91 Waterways Licensing Program

Administered by the Wetlands and Waterways Regulatory Division of the State's Department of Environmental Quality Engineering, this program establishes uniform procedures for review and licensing of activities in the waterways and on the subtidal lands of the Commonwealth. It provides for an evaluation of specified environmental interests and for the protection of public interests in inter- and sub-tidal lands. The performance standards for waterways projects are to "minimize" adverse effects to the environment. As a matter of policy, the Division defers issuing a license until a permit under the Wetlands Protection Act has been written for the project. The conditions under the Wetlands Order are generally included in the Waterways permit to provide environmental protection standards.

iv. Area of Critical Environmental Concern

In November of 1979 the Secretary of Environmental Affairs designated Waquoit Bay, Washburn Island, South Cape Beach, Hamblin and Jehu Ponds, some connecting waterways and adjacent uplands to the 11-foot contour (the level of the so-called 100-year storm) as an Area of Critical Environmental Concern (ACEC). Figure 7 indicates the designated boundaries. Designation followed an extensive environmental review, an extended public comment period, and two public hearings. (See Appendix 3 for a copy of the designation document.)

The effect of designation is to raise certain environmental performance standards under the Wetlands Protection Act from "minimum" adverse impacts on certain public interests protected by that Act to "no" adverse allowable impacts. Under Chapter 91 all new improvement dredging within the ACEC is prohibited unless the purpose is to enhance biological productivity. Likewise, disposal of dredge spoils is prohibited within an ACEC unless for beach nourishment or marsh creation. Special review standards are established for the siting of any energy facility within an ACEC and the regulations of the Division of Water Pollution Control require the elimination of discharges of hazardous substances, and prohibit new industrial discharges and direct discharges from new sewage treatment facilities. Under the Massachusetts Environmental Policy Act (MEPA) it is noted that every project, of whatever magnitude, requiring any state permit, approval or other authorization, or involving state funding at any level must initiate a public review. This review may lead to the requirement of an Environmental Impact Report. (See below for further discussion of the MEPA process.) Finally, all agencies under the Secretary of Environmental Affairs are required to write or revise regulations, administer programs and issue permits so as to conform with Policy 2 of the Massachusetts Coastal Zone Management Program: "ensuring that activities in or impacting on such complexes are designed and carried out to minimize adverse effects on marine productivity, habitat values, water quality and storm buffering values of the entire complex."

The boundaries of the designated Waquoit Bay Area of Critical Environmental Concern and the proposed Waquoit Bay National Estuarine Sanctuary are generally similar, but do not coincide exactly. A comparision of the Figures 3 (proposed Sanctuary boundaries) and 7 (ACEC boundaries) delineates the difference. The Great and Little River area navigation corridors within the Bay are not included within the State designated ACEC. Within these areas, improvement dredging is allowed under existing State requirements.

v. Massachusetts Environmental Policy Act

The Massachusetts Environmental Policy Act (MEPA) serves to establish a uniform method of information collection for use in the environmental evaluation of the impacts of a proposed activity. A process is established for public notification of proposed projects via the Environmental Monitor published every three weeks through the Massachusetts Executive Office of Environmental Affairs. Projects exceeding specified thresholds require the completion of an Environmental Impact Report detailing effects of the work planned. All activities conducted, licensed, regulated or funded by any agency of the Commonwealth which will take place within or affect an Area of Critical Environmental Concern require public notification and at least a preliminary review by the MEPA office. Even activities such as preliminary planning for the Waquoit Bay National Estuarine Sanctuary proposal required MEPA review. (See Appendix 4 for notification of EOEA # 4256 and public notice dated May 8, 1984.)

f. Existing Management Program at South Cape Beach

The Massachusetts Department of Environmental Management is presently developing a management plan for South Cape Beach State Park under the terms of an agreement between the Town of Mashpee and the Commonwealth. This agreement,

discussed on page 12 (copy in Appendix 2) sets the general nature of activities to be allowed at the Park and establishes a South Cape Beach State Park Advisory Committee for review and advice on specific management issues. The general tenor of the agreement is that the Park is established for passive recreation, limited in participants, that is consistent with the "fragile ecology of the site". Facilities are to be designed and maintained so that they do not harm the natural and scenic qualities of the area.

An interpretive program is being developed at the Park that will complement and become a part of the educational program of the proposed Sanctuary. Exhibits may be established and initial visitor contacts made that can refer interested parties to the Sanctuary office for more detailed information. The presence of Park staff will provide enforcement of Park and Sanctuary regulations and policies and can serve to monitor and protect research activities.

There will be close contact between the Sanctuary Manager, the Park Supervisor and the South Cape Beach state Park Advisory Committee as the details of the management plans for both the Sanctuary and the State Park are completed to ensure that they are parallel and complementary. All Sanctuary activities which take place within Park boundaries will be compatible with the agreement of June 29, 1981, discussed above.

g. Existing Management Program at Washburn Island

The Management Plan for Washburn Island is still in a very preliminary stage. As a result, its development provides an opportunity for the Park Supervisor, Department of Environmental Management Planners, and the Sanctuary Manager to work closely in order to develop complementary policies, procedures and regulations. The concepts of the Washburn Island Preliminary Management Plan of April 1983 (see Appendix 5) are hereby incorporated into the Draft Sanctuary Management Plan and the policies and philosophies of the Draft Sanctuary Management Plan will be worked into the Final Management Plan for the Island portion of the State Park.

h. Local land-use Regulations

i. Shellfishing and fishing

Shellfishing and most forms of salt-water fishing are under the general control of the State Division of Marine Fisheries. In the case of Falmouth and Mashpee, the Division has granted management of resources in local waters to the respective towns following the preparation and acceptance of a suitable management plan. The regulation of these resources is under the direct supervision of the local Shellfish, or Natural Resource, officers, appointed by the Boards of Selectmen. The Sanctuary designation will not change the existing arrangements regarding the towns' relationship with the Division of Marine Fisheries, the local management plans for fish and shellfish, or local enforcement of these regulations. It is hoped that the Sanctuary Research Program will be able to provide accurate and useful information on fish and shellfish stocks, habitat or sustainable yield for the local shellfish programs. There is no intent to interfere with the present system of fish and shellfish regulation.

ii. Harbormasters

Under Massachusetts law and reguations, control over most boating activities within Waquoit Bay and its connecting water bodies is vested in the local Harbormasters, and their assistants, appointed by the respective Boards of Selectmen. Harbormasters have the authority to establish mooring and anchorage locations, develop masterplans for harbor use (often with the assistance of Waterways Committees), and to enforce any local by-laws pertaining to boating. The Sanctuary designation will not change the existing arrangements regarding these local plans, authorities, or enforcement; no existing programs will be changed as a result of the establishment of a Sanctary. As above, it is hoped that the Sanctuary research and education programs will be able to assist local programs.

iii. Falmouth Area of Critical Environmental Concern By-Law

At its Town Meeting in the Spring of 1983, the Town of Falmouth adopted a by-law to incorporate the state-designated Area of Critical Environmental Concern (ACEC) boundary into their zoning structure. Within the ACEC boundaries and a 25-foot buffer zone around those boundaries, regulations are adopted to limit construction and alteration of vegetation. No similar by-law has been developed in the Town of Mashpee.

The designation of a Sanctuary will have no effect on this local by-law; it will continue to be administered and enforced officials of the Town of Falmouth.

iv. Local wetlands by-laws in Falmouth and Mashpee

Both the Towns of Falmouth and Mashpee have adopted local by-laws for the protection of wetlands resources and values. Both of these are patterned after the State Wetlands Protection Act described above. The local by-laws, however, establish an appeal procedure through the courts system rather than through the Department of Environmental Quality Engineering. Each of the by-laws also includes interests additional to the seven specified in the state law, including such things as wildlife, aesthetics and recreation. These by-laws are administered locally by the Conservation Commissions.

The designation of a Sanctuary will have no effect on these local by-laws or their implementation. They will continue to be administered and enforced by local officials within the Towns of Falmouth and Mashpee.

3. The "Physical Plant", Buildings and other facilities

a. Swift Estate

It is intended to acquire and develop a portion of the Swift Estate as headquarters for Sanctuary operations. The existing large Victorian house will be developed as a public area including meeting rooms, lecture hall and display area. Research components located in the headquarters will include office space, library and research file areas, and, where possible, small scale laboratory space and dormitory space for researchers. The carriage house will be used for rough laboratory areas, workshops, and equipment storage. Most of the Sanctuary administration activities will be centralized at this site.

Both of the existing buildings will need considerable renovation to meet expected needs and existing building and safety codes. Funding for much of this activity will be provided through the initial Federal acquisition and development award, although, additional funding sources will be investigated. The exterior of the buidings will be restored as faithfully as possible to their original Victorian splendor. The landscaped grounds will be restored to their former status following a complete inventory of species present.

b. South Cape Beach

Management plans for South Cape Beach call for a visitor center that will have space allocated for displays of the resources found in and environmental processes acting on Waquoit Bay, South Cape Beach and Washburn Island. This fits well into the Sanctuary plan and can serve to introduce visitors, in an informal way, to the values and interrelationships of the Sanctuary. Visitors with a further interest can then be directed to the Sanctuary Headquarters or to one of the educational activities sponsored by the Sanctuary. Preliminary plans also include a small amphitheater near the visitor center that can be used as an outdoor, or natural, classroom for interpretive or other educational activities.

Self-guided trails and boardwalks are also part of the management plan for South Cape Beach State Park. These too, will add to the educational experience of the Sanctuary.

c. Washburn Island

The preliminary master plan for Washburn Island provides for no buildings other than comfort stations. Boardwalks and scenic overlooks are being proposed to provide exposure to scenic but sensitive areas. These structures support the Sanctuary policies and, as part of the Washburn Island Master Plan, are incorporated into plans for the Sanctuary.

4. Research Program and Policies

a. Goals

The primary research goals for the proposed Waquoit Bay National Estuarine Sanctuary are three-fold:

i. To establish adequate baseline data on the nature and functioning of a "protected" estuary, so that knowledge may be used as a control against which to judge activities in other similar areas.

This will require a thorough inventory of resources and conditions present in the Sanctuary and in those adjcent areas that affect it, as well as an understanding of the interrelationships among these resources and natural environmental forces. Collection and review of existing baseline data will be a necessary first step and will set the direction for subsequent research.

ii. To develop an understanding of the impacts of human activities, both obvious and subtle, on the resources of the Sanctuary.

iii. To make information developed from the above research available and useful to those responsible for resource management and land-use planning at individual, local, State and Federal levels.

b. Research Program Framework

To meet these goals, a research program will be developed for the Sanctuary that will encourage and support scientific investigations within the boundaries of the Sanctuary, and in nearby areas of a similar nature. To provide direction, the Sanctuary Research Program will establish the following:

i. Policies to establish priorities and procedures for the types of research to take place under the auspices of the Sanctuary;

ii. Procedures for evaluating, permitting and monitoring research activities; and

iii. Procedures for the dissemination of research results.

c. Research Policies

Policy 1 Research that pertains directly to the management of the resources of the Sanctuary will be actively encouraged and will receive highest priority of any research conducted by Sanctuary staff or supported by Sanctuary funding.

As stated above, the principal goal for research within the Sanctuary is the development of appropriate management techniques for coastal resources. To meet this objective, initial priorities will be given to assessing and monitoring the existing resources of the Sanctuary. These objectives will necessitate activities such as:

° Baseline measurements of the biological, chemical and physical characteristics of the Sanctuary and areas which affect it.

- Characterize, and to the extent practicable, document the location, extent and composition of the biological resources of the Sanctuary;

- Identify the hydrologic and geomorphologic processes such as water currents, sediment characteristics and movement, etc., that shape the Sanctuary;

- Determine water quality in various areas of the Sanctuary and identify factors which might cause alteration.

° Periodic monitoring of changes in the biological, chemical, and physical conditions of the Sanctuary.

- Track changes over time in the location, extent, and composition of the biological resources of the Sanctuary and identify the causes of these changes;

- Track changes over time in water circulation patterns and landforms and identify the causes of these changes;

- Track changes over time in the location, extent, and composition of the biological resources of the Sanctuary and identify the causes of these changes;

- Track changes in water quality over time to determine seasonality, storm effects, etc., and identify the casues for such changes.

° Studies of the effects of commercial and recreational shellfishing on the resources and habitats of the Sanctuary.

- Determine the level of shellfish resources and the appropriate level of harvesting to reach a maximum sustainable yield;

- Evaluate the effects of various means of shellfish harvesting on the habitat and populations of various species.

° Studies of the effects of other human activities on the flora, fauna, physical processes, and ecological composition of the Sanctuary.

- Review the effects of recreational boating on the resources of the Sanctuary in order to help communities devise practical and resource-related harbor use and mooring plans;

- Monitor the effects of development in the uplands around the Bay and connecting ponds on water quality, sedimentation, salt marshes and other resources;

- Determine the effects from recreational activities along the beach and attempt to define a "carrying capacity" in order to maximize human use and minimize adverse impacts on the resources.

Policy 2 Research will be actively encouraged that will provide information on estuarine ecosystems which will improve coastal resource management decisionmaking at the sanctuary site, on Cape Cod and the Islands, in Massachusetts and other states in the Virginian biogeographic region, and in the Nation.

When designated, Waquoit Bay and its surrounding areas would be set aside to provide valuable information which can be used to manage more responsibly resources in similar estuarine systems. As there is increased pressure for

development in such areas, there is a greater need for scientifically-based information that will make possible sensible, sensitive, land-use decisions both on Cape Cod and in other coastal areas.

Policy 3 Research which bears less of a direct application to the management of coastal resources will be permitted and encouraged as long as it does not conflict with research related to resource management.

All types of research will be encouraged in the Waquoit Bay National Estuarine Sanctuary; one of the principal reasons for the designation is to foster scientific research. However, in situations where research proposals may be in conflict with study sites or funding, that proposal which has the greater resource management potential will be given priority.

Policy 4 Research involving manipulation of the Sanctuary environment will only be permitted on a very limited basis, and will be reviewed strictly. If allowed, such projects will be for specified time frames only. Researchers must, upon completion, restore the project site to its original condition.

Manipulative studies, those which cause physical, biological, and/or chemical changes to the environment, are often useful in establishing cause-and-effect relationships. However, such studies are generally incompatible with the goals of the Sanctuary. Alteration of natural processes could defeat the purpose of maintaining the Sanctuary as a control for comparative studies or of supporting existing flora or fauna. Although not encouraged, limited manipulative research would be allowed only if there are demonstrable benefits to the Sanctuary and its programs; if the effects are of short duration and can be reversed at the end of the experiment; and if they are carefully monitored for unexpected and undesired side effects.

Policy 5 Before commencing work, researchers must have all appropriate collecting or handling permits from applicable State or Federal agencies.

Collection and/or handling of many species of wildlife require special permits from State or Federal agencies. Anyone wishing to perform this sort of research within the boundaries of the Sanctuary must have the appropriate permits from such agencies as the Massachusetts Division of Marine Fisheries, the U.S. Fish and Wildlife Service, etc.

Policy 6 Proposals for major research within the boundaries of the Waquoit Bay National Estuarine Sanctuary must be submitted in writing to the Sanctuary Manager and receive a favorable review from the Research Advisory Committee prior to commencement.

A written proposal must be approved in order for major research work to be done in the Sanctuary. The proposal must include the following information:

- name, address, telephone number and professional or agency affiliation of the principal investigator;
- names of persons to be involved in field work;

- objectives of the proposed study and their relationship to the goals and policies of the Sanctuary and to the management of coastal resources;

- accurate location(s) of proposed work site(s) within the Sanctuary;

- explanation of methods, materials and equipment to be used; and

- duration of the study, starting and expected completion dates.

Availability of this information will allow a prior review of the proposal, will allow for coordination of research activities and will allow monitoring, and protection, of research sites and equipment.

Routine activities such as water quality sampling, shellfish or finfish sampling, bird banding, or other non-manipulation research conducted by State or Federal agencies will not require a proposal. However, the agency involved should notify the Sanctuary Manager either by telephone or in writing prior to commencement in order to avoid conflicts in research activities.

The Sanctuary Manager, with the advice of the Research Advisory Committee, will evaluate the feasibility of proposed projects based on their scientific and technical merit and their relationship to the goals and research policies of the Sanctuary. Field work may not begin in the Sanctuary until the principal investigator receives written notification of approval from the Sanctuary Manager. All attempts will be made to make the review process as efficient as possible while maintaining standards for the protection of the Sanctuary.

Policy 7 Research that does not comply with the goals and policies of the Sanctuary Research Program will not be approved. Research that does not comply with the original proposal submitted will be terminated.

Policy 8 Researchers are responsible for maintaining all equipment in a safe condition during the experiment period and for removing it upon completion of the research. Any disturbance to the site must be restored to its original condition.

Maintenance of field equipment by researchers in a safe condition will protect them as well as the public. It is expected that all equipment and refuse will be removed from the site as soon as possible. This serves to keep the Sanctuary in a pristine condition for the use and enjoyment of others.

Policy 9 The Sanctuary Manager or staff will periodically monitor the progress of research taking place in the Sanctuary. Researchers will be required to present a final progress report no later than 90 days after completion of field work. For projects that extend longer than a year, annual progress reports should be made to the Sanctuary Manager. Copies of progress reports made to funding agencies are acceptable.

The Sanctuary Manager and staff are responsible for maintaining contact with researchers and being aware of the status of the work. Progress reports provide a valuable record of types, locations and volume of work done in the Sanctuary.

Policy 10 After completion of the research project, researchers should submit to the Research Advisory Committee an abstract summarizing the project and its results and at least one copy of any report, publication, dissertation, or thesis resulting from work in the Sanctuary. If research is funded through the Sanctuary, researchers will be expected to present a short paper, suitable for a newsletter format, explaining the research, its results, and implications for management of coastal resources.

Copies of abstracts and other publications will be filed in the Sanctuary Office along with the research proposal and progress reports. Availability of research results and information taken from the abstract will be disseminatend to local, State and Federal agencies, environmental groups and other interested parties. A centralized repository for all research products from the Sanctuary will facilitate review and dissemination of information. The Sanctuary Manager and staff will be responsible for directing such products to the agencies, groups, or individuals where they will be useful. A format for abstracts will be developed to facilitate understanding, dissemination, organization, and retrieval of information.

Policy 11 The Sanctuary Manager, staff and Research Committee will disseminate information on work that has taken place in the Sanctuary and recruit other researchers to use the Sanctuary.

As a base of research builds on the Sanctuary's resources and conditions, other researchers should be attracted. It will be the function of the Sanctuary Manager, staff and the Research Committee to make known previous work, facilities available, access to, and research possibilities of the Sanctuary. This may be done through a newsletter with wide distribution, scientific publications, brochures, etc. Research summaries will be provided to the news media and newsletters of various scientific and regulatory agencies.

d. Research Advisory Committee

The Waquoit Bay National Estuarine Sanctuary Advisory Committee will be responsible for recruiting a Research Advisory Committee. Membership should include persons with a scientific research background, persons with a resource management background, and persons involved in land-use decision-making. It will be the function of this Committee to work with the Sanctuary Manager to:

i. further develop and refine the Sanctuary Research Program;

ii. review research proposals and results of work within the Sanctuary for suitability and conformance with the established goals of the Research Program,

iii. publicize Sanctuary facilities and recruit researchers to work in the Sanctuary, and

iv. with the Sanctuary Manager, develop sources of funding and distribute such funding for research within the Sanctuary.

The Committee members will serve one-year terms with no limit on reappointments. Their work will be critical in assuring that research done in the Sanctuary meets the goals and policies of the Research Program. In so doing they will assure the continuation and direction of the Research Program and help protect the resources of the Sanctuary.

e. Funding

It is hoped that the Waquoit Bay National Estuarine Sanctuary will be able to provide limited funds for research. Initially these may be provided, on a competitive basis, under the National Estuarine Sanctuary Program administered by the Federal Office of Ocean and Coastal Resource Management. Further sources of funding, from foundations, funding agencies, or private individuals and organizations will be sought. Such funds will be used to directly support researchers or to acquire necessary equipment for studies within the Sanctuary.

5. Education Program and Policies

a. Goals

The principal educational goal of the Waquoit Bay National Estuarine Sanctuary will be to provide a program of educational opportunities and activities that will foster a public awareness and understanding of estuarine ecosystems, man's effects on them and the importance of these systems to the community, region, State, and Nation.

b. Educational Program Framework

To meet this goal the Educational Program will:

i. establish procedures to develop and support varying types of educational activities to be carried out both at the Sanctuary headquarters and at various visitor centers on South Cape Beach and Washburn Island;

ii. establish procedures for coordinating educational activities among these areas;

iii. establish procedures for transferring scientific information generated through the Sanctuary Research Program into lay terms and making it available to coastal management decision-makers.

The Sanctuary Research Program will generate information about Waquoit Bay and its environs, and it will be the task of the Education Program to disseminate this information to the public. Recipients may range from decision-makers on Planning Boards, Boards of Health or Conservation Commissions, to State or Federal regulatory agencies, to decision-makers of tomorrow - our children. Learning more about the estuary and its functioning, and about how research is conducted and information is gathered is a valuable experience for all.

Personal contacts will continue with individuals and groups that have been established by the Interpretive Program of the Department of Environmental Management at South Cape Beach and Washburn Island. This method of instruction provides a valuable field experience for participants. The availability of a Sanctuary Headquarters will also make possible "classroom" situations for groups activities: lectures, slide shows, classes, etc., as well as facilities for individual literature searches and specimen study.

Publications of various sorts: brochures, newsletters, etc., will reach a broader public and will be actively pursued. These may draw on and be coordinated with local schools, colleges, museums and other organizations. Visitor orientation packets or trail guides will be developed to allow individuals to explore and learn at their own pace.

On-site educational programs will be coordinated by the Sanctuary Manager and staff to avoid conflict with research activities being conducted within the Sanctuary. It will also be the function of the Sanctuary Manager and staff to coordinate the various educational activities held in the Sanctuary, to recruit outside speakers or programs, and to provide adequate facilities for such programs.

c. Education Policies

Policy 1 On-site programs will be provided in conjunction with existing activities.

Policy 2 Off-site educational programs will be provided in conjunction with school systems, civic and environmental organizations, colleges and other educational institutions to make the public aware of the Sanctuary, its facilities and its role at the local, regional, state and national levels.

"Nature walks" and the Interpretive Programs will be available. Tours may be offered to public groups upon request. Research site tours may be arranged with the cooperation of the researchers to provide an insight into methods and types of data gathering and interpretation. It is hoped that the Sanctuary can become a "living classroom" for its visitors.

Policy 3 On-site activities will be coordinated so that they do not interfere with established research projects.

The Sanctuary Manager and staff will ensure that all scheduled educational activities are located away from research sites, unless coordinated with researchers.

Policy 4 Literature, visual aids, and other related materials will be developed, distributed and routinely updated in order to convey to the general public, management agencies and to the scientific community the goals, programs and accomplishments of the Sanctuary.

Policy 5 The Sanctuary Manager and staff will actively encourage the dissemination of scientific information developed through the Research Program.

As mentioned above, a high priority of the Sanctuary will be to get accurate, useable resource management-oriented information to the decision-makers in coastal management planning. The Education Program will work to provide this material in written,visual, or spoken form. Researchers will be encouraged to make public presentations of their work and research results will be distributed in abstract form either directly or through a periodic newsletter.

Policy 6 The Sanctuary Manager will coordinate the activities of the Educational Program to provide the broadest exposure and dissemination.

d. Education Advisory Committee

The Waquoit Bay National Estuarine Sanctuary Advisory Committee will be responsible for recruiting and appointing an Education Advisory Committee. Membership should include persons with a background in education at various levels from primary education through college, persons with a media background, and local decision-makers. It will be the role of this Committee to work with the Sanctuary Manager to:

i. further develop and refine the Sanctuary Education Program,

ii. develop and define educational activities, with various formats for presentation to varying audiences,

iii. publicize Sanctuary educational activities and recruit individuals and groups to use the facilities of the Sanctuary, and

iv. develop sources of funding to sponsor educational activities, publications, media presentations, etc.

The Committee members will serve one-year terms with no limit on reappointments. Their work will be critical in assuring that information about the Sanctuary and coastal and estuarine resources in general is disseminated to the public.

e. Funding

It is intended that, to the maximum extent possible, the education program of the Sanctuary will be financially self-sufficient. Tuition for classes, or donations for lectures and slide-shows, sale of publications, memberships in a

Sanctuary support group, grants from funding agencies, etc., can all help to defray the costs of education. It is not intended that each educational program be self-supporting, but that the program as a whole cover its costs.

6. Objectives and Policies for Other Activities

a. Hunting, Fishing and Shellfishing

Hunting, fishing and shellfishing are traditional uses of the Waquoit Bay, South Cape Beach and the Washburn Island area. Presently each of these activities is subject to local and State jurisdiction. The Sanctuary designation will not change the existing arrangements concerning these activities in the Bay, or at South Cape Beach and Washburn Island.

Hunting on Washburn Island and on South Cape Beach has been the subject of discussion in the past. Any final decision on allowing this practice will be made by the Department of Environmental Management as administrators of the parks at these sites based on public use, safety and welfare. The South Cape Beach State Park Advisory Committee reviews the issue of hunting and makes its recommendations yearly depending on use patterns.

Due to the limited size of the property and the prospects of a sizable public presence, hunting will not be allowed on the Swift Estate property once it becomes part of the Sanctuary.

b. Off-Road/Over-Sand vehicles

This issue is only a valid concern at South Cape Beach State Park. According to the agreement between the Commonwealth and the Town of Mashpee, use of these vehicles will be severely limited. Use by the elderly and handicapped is provided in order to allow access to fishing spots. They may be used by permit only and are restricted to designated roadways. See Appendix 2 for a copy of the Mashpee/Commonwealth agreement.

c. Boating

As discussed above, control of boating activities is the province of the local Harbormasters or the U.S. Coast Guard. The policy of the Sanctuary Program will be to accept the local plan and enforcement and the authority of the Coast Guard.

d. Public Access

Public access to the resources of the Sanctuary is a prime objective of the Sanctury Program. It will be encouraged to the extent that the resources will bear. There may be periods where access will be limited due to stress on some sensitive environmental resource (e.g., tern nesting areas during the breeding season, erosion on a coastal bank, etc.) or to protect the location, equipment or resources forming a part of research activities. These "closures" will be coordinated between the Sanctuary Manager and the Park Supervisor and will be posted. The Park Supervisor will be responsible for enforcement of any "closures" at South Cape Beach Park and on Washburn Island; the Sanctuary Manager for the Swift Estate.

B. Other Alternatives Considered

In developing the Preferred Alternative for the Waquoit Bay National Estuarine Sanctuary described above several options were carefully reviewed. These will be described below along with the reasons for their rejection.

1. No Action/Status Quo

Under this option no designation of a national estuarine sanctuary would be made in Waquoit Bay or anywhere else in Massachusetts.

One of the considerations of the Commonwealth in the acquisition of South Cape Beach State Park and Washburn Island was the protection of the relatively pristine nature of Waquoit Bay and its preservation for future generations. This was the last relatively undeveloped warm water beach available on Cape Cod and was highly desirable property. Both parcels were threatened with development in one form or another and would have limited or prohibited public usage. The possibility of establishing this area as a national estuarine sanctuary was a prime consideration of the Commonwealth of Massachussetts in the decision-making process leading to these acquisitions. The natural and recreational resources of Waquoit Bay were widely recognized and there were concerns that existing regulatory programs might not have the authority or coordination to provide adequate protection. Acquisition seemed to be the best option for preservation.

The continuing development pressures experienced on Cape Cod, the Islands, southeast Masachusetts and the rest of the coastline of the Commonwealth require an understanding of the resources of this coastal area, the interrelationships within coastal ecosystems, and their ability to withstand human pressures. The research and education facilities associated with a national estuarine sanctuary can make a significant contribution to the understanding and protection of sensitive coastal resources and can also improve coastal management decisionmaking. Therefore, designation of a National Estuarine Sanctuary in Massachusetts, particularly in Waquoit Bay, will facilitate an improved understanding of coastal resources. "No action" would run counter to State and Federal goals of protection, study, and appropriate management of sensitive coastal resources; particularly estuarine ecosystems.

2. Alternative Sites

The process used by the Commonwealth in selecting Waquoit Bay for a proposed national estuarine sanctuary is described on pages 6-8. Several other sites were reviewed in detail and ultimately rejected prior to the choice of Waquoit Bay. Those sites receiving particularly careful review include the North/South Rivers system in the Marshfield/Scituate area and Ellisville Harbor in Plymouth.

The North/South River complex was very carefully considered for additional protection and preservation. The rivers begin in fresh water ponds and wetlands and flow for miles through marshes of increasing salinity until reaching their common mouth at New Inlet and emptying into Massachusetts Bay. Over 2000 acres of saltmarsh flank the rivers. Hummarock Beach, a sizable barrier beach fronts the South River, protecting it from the effects of storms. There has been considerable development along Hummarock, particularly in summer and, increasingly, in year-round housing, and along the lower portions of the rivers.

The system is extended linearly; salinity levels are measurable 13 miles upriver in the North River and 11 miles in the South.

Ultimately it was these two latter points, the amount of development at the mouth and the extended length, that made this site less attractive than Waquoit Bay for National Estuarine Sanctuary designation. Acquisition of such extended areas, and of developed areas, would have been difficult and extremely expensive. In Waquoit Bay, by acquiring two major parcels, it was possible to provide a considerable amount of preservation to a significant area. This situation was not feasible in the North/South River system. It was agreed that a better means of protection for this area would be a State Scenic Rivers designation. A greenway corridor has been established to afford a buffer to this waterway. In addition the marshes in the complex were restricted under the Coastal Wetland Restriction Act.

Ellisville Harbor is a small inlet in the town of Plymouth. A break in a barrier beach opens, into a shallow harbor and saltmarsh complex. Adjacent to the marshes are a series of freshwater wetlands that have been utilized for growing cranberries. The harbor has historically been used for shipping cordwood and fish. Broad-beamed, flat-bottomed boats sailed onto the beach and flats within the harbor at high tide. When the tide ebbed cargo was hurried across the exposed flats to the now grounded ships by wagons. At the next high tide the vessels would refloat and carry their cargo to port, usually Boston. The harbor is still used by a small fleet of fishing boats and for recreational shellfishing and the beaches are used for swimming.

This site was ultimately rejected for consideration as a National Estuarine Sanctuary because of its small size, limited freshwater input, and periodic inaccessibility to sufficient water for navigation. It has, however, been designated by the Commonwealth as an Area of Critical Environmental Concern and carries the added protection of that program.

3. Alternative Boundaries

The boundaries for the preferred alternative include: South Cape Beach; Washburn Island; the Swift Estate; and Waquoit Bay, Hamblin, Jehu and Caleb ponds and the lower Quashnet River (Figure 3). Additional boundary alternatives are discussed below.

a. Boundary Alternative 1: Inclusion of Town of Mashpee Inholdings at South Cape Beach State Park.

In considering Sanctuary boundaries, it was decided to exclude approximately 30 acres within the borders of South Cape Beach State Park, where the Town of Mashpee will own and operate a Town Beach and parking area. In addition, 10 acres bordering on the Great River and Waquoit Bay to which the Town also will gain ownership rights, have been excluded from proposed Sanctuary boundaries as well. These parcels will be transferred to the Town of Mashpee as the development of the Park progresses; they are currently included in the State's holdings.

Exclusion of these properties from the proposed Sanctuary boudaries was decided upon in order to avoid any possible difficulties with the transfer of land between the Town and State. At some future date, the Town of Mashpee will be approached through either the Board of Selectmen or the Town Meeting,

whichever is appropriate, to ascertain whether there is interest in these areas becoming part of the Sanctuary. These parcels could remain under the ownership and management of Mashpee if that management was compatible with the Sanctuary Program. These areas would be eligible for inclusion in the Sanctuary with appropriate binding agreements regarding their use.

b. Boundary Alternative 2: Exclusion of Little River and Great River

Consideration was given to the exclusion of Great and Little Rivers from the Sanctuary boundaries because of possible dredge activities and the substantial development along their banks, particularly on Seconsett and Monomoscoy Island. The proposal to include these areas within the Sanctuary boundary recognizes that there may be future dredging in these areas. However, it is felt that there is significant protection of the resources through the existing regulatory structure of the state Wetland Protection Act and Waterways Licensing process. The National Estuarine Sanctuary Program is designed to allow multiple use of sanctuaries, when compatible with the protection of sanctuary resources. It was felt that these sanctuary resources would be adequately protected through existing State regulatory controls. Therefore, because of their character as significant connecting waters within the Waquoit Bay esturine system, the Great and Little Rivers are proposed for inclusion within the Sanctuary.

These areas are not included within the Waquoit Bay Area of Critical Environmental Concern (ACEC). Therefore, these areas are eligible for new, improvement dredging. There is, in fact, an imminent dredging project at the mouth of the Great River. Improvement dredging is prohibited within the ACEC including Waquoit Bay outside the central navigation corridor, the Quashnet River and Hamblin and Jehu Ponds.

c. Boundary Alternative 3: Exclusion of Saltmarsh Areas around Hamblin and Jehu Ponds.

At the head of Great River and along the shores of Hamblin and Jehu Ponds are 193 acres of saltmarshes (see Figure 11). These are all in private ownership. The Town of Mashpee, however, holds a conservation easement granted by the New Seabury Corporation for a border around the southern and western section of Jehu Pond. All of the marshes are protected to the "shall not Act. The 42 acres of marsh in Falmouth are also protected under the State Coastal Wetland Restriction Act. The 151 acres located in Mashpee have not been restricted to this point in time, however as the only town on the Cape that is still unrestricted under the Coastal Wetlands Restriction Act, the town is at the top of the priority list for the time when funding and staff levels permit action. Such action is planned within the next two years. The marshes in both towns are further protected under local wetlands by-laws and these in Falmouth under their ACEC by-laws.

Under these existing programs these areas are, or soon will be, sufficiently protected to meet the adequate State control standard of the National Estuarine Sanctuary Program. Therefore, it was proposed to include them within the Sanctuary boundaries. Inclusion within the Sanctuary does not bring additional restrictions to this property.

Because these areas are private property, the Sanctuary program would not be able to provide public access. Following NOAA approval of the proposed Federal financial assistance award for acquisition and development, however, owners of this land will be approached in an attempt to acquire ownership or access rights for scientific or education purposes. Every effort will be made to conduct these discussions on a willing seller basis. This will be attempted either through fee-simple acquisition, purchase, or conservation or other easement rights, or donation of property rights or easements.

Inclusion of these areas would therefore enable the State, using funds provided under the National Estuarine Sanctuary Program, to work with willing landowners to acquire access rights, easements, or fee-simple interests in important marsh areas of the Sanctuary.

d. Boundary Alternative 4: Inclusion of Other Parts of the Area of Critical Environmental Concern (ACEC).

Boundaries of the portions of the Waquoit Bay ACEC lying along the Childs (Falmouth) and Quashnet (Falmouth/Mashpee) Rivers, Red Brook (Falmouth/Mashpee), Bourne and Bog Ponds (Falmouth), and Witch and Jim Pond (Mashpee) were defined by the levels of tne 100-year flood plain. This is coincidental with the 11-foot elevation above mean sea level. Generally they provide a buffer from resources found within the bay, rivers, ponds and marshes.

These areas are protected under the State and town Wetland Protection Acts, although the protection standards for these "areas subject to flooding" are somewhat weaker than for other resource areas under the Act. None of these sites have been restricted under the Wetlands Restriction Act. Virtually all of this area is in private ownership and a portion is being used as a functioning cranberry bog.

For the following reasons these areas, while part of the ACEC were not included in the proposed Sanctuary boundaries:

i. areas are principally buffers for "downstream" resource

ii. protection under existing programs is somewhat less stringent than tne resource-related areas in the Bay, river and ponds.

iii. areas are generally under private ownership with low potential, due to funding priorities, for acquisition.

e. Boundary Alternative 5: Inclusion of Eel Pond and the Childs and Seapit Rivers.

These areas lie to the west of Washburn Island and connect to Waquoit Bay at the northern end of the Seapit River. Prior to the 1938 hurricane Waquoit Bay and Eel Pond were more closely allied. At that time a barrier beach extended from Washburn Island westward to the mainland. This situation meant that Eel Pond flushed through Waquoit Bay on its way to Nantucket Sound. This barrier was breached in 1938, destroying a road and several houses. It apparently was repaired but was breached again in 1944. Since that time this area has remained open to the sea, lessening its relation with Waquoit Bay. Because of its separate identity, the potential need for dredging, and the substantial level

of development along the western shoreline of the Seapit and Childs River, this system of waterways was not included in the Waquoit Bay Area of Critical Environmental Concern. For the same reasons it is not proposed for inclusion within the Waquoit Bay National Estuarine Sanctuary.

4. Alternative Management Plan Options

Various alternative management plan options were reviewed and rejected prior to proposing the preferred alternative. Those options are listed and reviewed below.

a. Greater restriction on public access to South Cape Beach and Washburn Island

Restricting access to these two parcels would serve to further protect the resources of a proposed Sanctuary.

A substantial part of the reason for acquisition of these areas was to increase public access. Although any public (or private) use would have some effect on the site's resources it was felt that workable management plans could be developed that would increase access and provide protection of the environment to a level that is compatible with the goals of the Sanctuary. These management plans take into account the limitations on parking at South Cape Beach State Park and the lack of land access to Washburn Island; both features keep visitor numbers to a manageable level. Further, it is noted that the Sanctuary Program encourages multiple, compatible use of the Sanctuary. For these reasons this option was rejected.

b. Locate the Sanctuary Headquarters somewhere other than the Swift Estate: (do not attempt to acquire the Swift Estate)

It was strongly felt that the Sanctuary Headquarters should be in the Sanctuary and have water access to Waquoit Bay. This would be beneficial to the Sanctuary's research and education programs and to enforcement/surveillance. A review of South Cape Beach and Washburn Island suggest that neither would be suitable for a Headquarters. Washburn Island, with no land connection, offers significant problems for access and necessary utilities. Parking and activities of South Cape Beach are limited by agreement between the Commonwealth and the Town of Mashpee. It is ecpected that during peak periods in summer months the parking lots will be filled by people wishing to use the beach. This situation could present conflicts with Sanctuary activites.

No other parcels have been located with comparable resources to the Swift Estate for access to roads, access to water and setting in relationship to the Sanctuary.

c. Establishing administration of the Sanctuary within another governmental body than the Department of Environmental Management.

Early consideration was given to establishing administration of the Sanctuary within various agencies including the Executive Office of Environmental Affairs, Division of Marine Fisheries (within the Department of Fisheries, Wildlife and Recreational Vehicles), or the Coastal Zone Management Office.

Locating the Sanctuary administration within the Executive Office of Environmental Affairs would give the Sanctuary Manager direct accessibility to the office of the Secretary of Environmental Affairs. It was decided that this would not be a critical need and that better coordination could take place if the program were incorporated into a line agency.

The Division of Marine Fisheries presently maintains research, survey and inventory programs and capabilities for finfish, shellfish and factors in their growth and development. Consideration was given to drawing on this experience in research and developing the Sanctuary administration through this Divsion. It was decided that the administration and education were also substantial components of the Sanctuary program and that the Sanctuary goals would be wider than fisheries interests.

The Coastal Zone Management Office has been the lead agency in developing the proposal for a National Estuarine Sanctuary in Waquoit Bay. Generally this is because of their role in developing sound management policies for coastal resources and their pre-existing relationship with the Federal Office of Ocean and Coastal Resource Management. The State Coastal Zone Management Office however, is not designed as a facilities or land management unit.

The Department of Environmental Management became the clear choice to manage the Sanctuary and administer its programs based on its experience in land and facility management, interpretive and educational programs, planning role, and current operation and management of South Cape Beach State Park and Washburn Island.

Figure 12

Alternative Sanctuary Boundary Excluding the Swift Estate

Figure 13

Alternative Sanctuary Boundary Excluding the Great and Little Rivers

Figure 14

Alternative Sanctuary Boundary Excluding the Salt Marshes around Hamblin and Jehu Ponds

III. AFFECTED ENVIRONMENT

A. Natural Environment

1. Geology/Soils

Cape Cod is almost entirely composed of unconsolidated sand, gravel and boulders deposited by glacial ice during the last four major glaciations. Occasional clay and silt layers and masses occur within and beneath the coarser materials. The deposits, resting on very old bedrock, are generally 300 to 500 feet thick, but range from around 150 to nearly 1000 feet in thickness. As the last glacier retreated from the Cape 12,000 years ago, sand and gravel was spread smoothly in front of the ice as stream-bed deposits. The entire Waquoit Bay area lies within one such area known as the Mashpee Outwash Plain.

As the glacier retreated, sea levels rose quickly, and had nearly reached present levels by 3500 years ago. The action of waves and currents shaped the coastline by filling some sheltered bays and tidal channels with fine sediment and organic matter producing tidal mud flats and salt marshes. This was likely the case with Flat, Sage Lot, Hamblin, and Jehu Ponds, probably low areas left as kettle holes after the formation of the outwash plain. The rise in sea level left them separated from the sea by only a narrow sandy spit which has been punctured periodically with inlets. All four ponds are salty, though the marsh to the north of Flat Pond is fresh. Waves also have shaped the sand spits and barrier beaches, with some contribution from wind action. The shore line is continually shifting.

There are several types of glacial deposits on South Cape Beach and Washburn Island. The majority of the site was formed by Mashpee pitted plain deposits, which are gravelly sand with some pebble to small boulder gravel. A smaller area bordering the northern edge of Flat Pond is composed of kame deposits, which differ from the Mashpee pitted plain deposits in having somewhat coarser sands and larger boulders.

Dune deposits along the beach are relatively young due to continual shifting of sands by wind action. They are generally less than twenty feet thick and between ten to several hundreds of years old. Most are still active. Sandy beach deposits with some minor cobbles and pebbles occur as spits. They are composed of wave-eroded glacial sediments, and tend to be overlain by dune deposits. The marsh and swamp deposits mentioned above consist mainly of decaying estuarine marsh plants along with sand and clay, topped by live marsh plants.

The soils on South Cape Beach and Washburn Island correspond to the geology, with some variations and additional categories. In the upland areas are several types of loamy course sand within the Mashpee pitted plain and kame deposit areas. The marsh and swamp deposits contain both muck and tidal marsh. The soil categories described below are from reports by the U.S.D.A. Soil Conservation Service.

Muck - These are very poorly drained bog soils formed in accumulations of organic deposits that are underlain by mineral soil materials. The upper

portion of the organic material is generally black and has decomposed to such a degree that plant remains cannot be identified by the unaided eye. Decomposition of the materials in the lower portion of the deep Muck soils varies from this condition to one of practically no decomposition, in which plant remains are readily identifiable. Muck soils occur in depressions and potholes. The water table in these soils is at or near the surface most of the year. Some Muck soils have only one to two-and-one-half feet of organic deposits over mineral soil materials, while in others the organic deposits are many feet thick.

Tidal Marsh - This land type consists of areas subject to regular tidal flooding. The areas commonly support salt-tolerant vegetation, such as grasses and sedges. The soil material ranges from soft, plastic silts and clays to matted, fibrous organic deposits.

Dune Sand - This land type consists of highly quartzose sands along the ocean shore. Individual sand particles have been rounded by the combined action of wind and waves. This land type is continually changing in shape and size. Dunes are formed by beach sand which is swept up by wind and deposited on the leeward side of the beach. Some are partially stabilized by beach grass and hardy shrubs such as beach plum and bayberry; others are devoid of vegatation and are actively shifting.

Coastal Beach - This land type consists of sandy, gravelly, or cobbly shores that are washed and rewashed by waves along the coast. Some areas are subject to periodic flooding by tides. Areas above tide level are subject to shifting by wind action.

Carver loamy sand, 0-3% slopes - These are excessively drained soils formed in thick sand deposits. Carver soils have a loamy coarse sand or coarse sand surface soil and subsoil. The subsoil is underlain by coarse sands. They contain little or no gravel. The soils are loose and have rapid permeability. In places, Carver soils are underlain at a depth of 5 feet or more by a firm slowly permeable substratum of compact glacial till, silt or clay. These areas are mapped as a firm substratum phase of the Carver soils. Carver soils occupy nearly level to very steep slopes.

Deerfield loamy course sand, 0-3% slopes - These are moderately well drained soils that have formed in thick deposits of sand. They have a loamy sand surface soil and subsoil that are usually free of gravel and cobbles to a depth of 3 feet or more. These soils have a seasonal high water table within 1-1/2 to 2 feet of the surface that keeps them saturated with water in the winter, early spring, and during prolonged periods of rainfall. They do not have stones and boulders on the surface or within the soil. They occur on level to gentle slopes.

Au Gres loamy course sand, 0-3% slopes - These are poorly drained soils developed in thick deposits of sand or sands and gravel. The water table is at or near the surface of these soils for about 7 to 9 months each year. They do not contain stones or boulders but may contain gravel and cobbles below the surface in some places. They have rapid permeability. Because

they are saturated most of the time, they can absorb little additional water. The Au Gres soils occuur on level to gentle slopes.

The Barrier Beach and Dune System

Almost the entire stretch of dunes (which extend the whole length of South Cape Beach) and the southern protion of the Washburn Island is also a barrier beach. The approximately 100 feet of beach running in front of the proposed new town parking lot is not part of te barrier system, as there is no marsh of water body between it and the mainland; rather its landward side is immediately adjacent to an upland area. Most of the Cape Cod shoreliine is continually being eroded by long-shore currents. Wher current directions diverge (nodal points), such as along the Outer Cape's eastern shore, erosion is accelerated. Where currents converge, accretion occurs. This latter occurrence takes place along the eastern half of Washburn Island and the western half of South Cape Beach, at the Waquoit Bay inlet. This rest of South Cape Beach is eroding at a moderate rate*

2. Hydrology

The loose, sandy soils of the Waquoit Bay area permit rapid percolation of precipitation. In unaltered areas there is virtually no run-off. Of the average annual precipitation of 42-44 inches, 17-18 inches seep into the soil to recharge ground-water aquifiers (the other 25 inches are lost to the atmosphere through evaportation and water loss by plants).

In coastal areas like Waquoit Bay, ground water is near the surface at approximately sea level. Low areas are often dischange poiints such as swamp, fresh water marshes or kettle hole ponds. The adjacent bodies of salt water have a major effect on ground water quality. Because fresh water is lighter than salt, fresh ground water at Washburn Island or South Cape beach tends to "float" above the saline in a relatively shallow lens. Along the edges and at the boundary there is some mixing to form brackish zones. The nature, and to some extent the level, of the ground water can change with tidal oscillation, amounts of fresh water percolation, and volume of fresh water withdrawal for human use. Excessive withdrawal can, and does lead to salt intrusion into individual or adjacent wells.

Analyses of ground water in the Waquoit Bay area characterize it as slightly acidic (ph 6.5-7.0), very soft and generally low in dissolved solids. Both sodium and chlorine levels can be high at individual sites due to salt water intrusion, and elevated iron and manganese levels are occasionally note.

3. Climate

The Falmouth-Mashpee area, like most of Cape Cod, has the humid continental climate of the northeastern United States. The surrounding waters moderate temperature extrems producing milder winters and cooler summers. Humidity is often high in summer, with fog common in the spring and summer.

*From Cape Cod Environmental Atlas, by Arthur H. Brownlow, Editor (Boston: Boston University, 1979), pp. 53-5.

Winds are generally from the west with orientation depending on the season; between October and April from the northwest, and between May and September from the southwest. Major storms can come in any season with hurricanes most common in late summer and early fall, "northeasters," in winter and early spring and local thunderstorms or squalls, in the summer. Hurricanes affecting the area occurred in September of 1938 and 1944, August of 1954 and 1955, and September of 1960.

January and February on the coldest months on Cape Cod and July and August are the warmest. The annual growing season (consecutive frost-free days) averages between 180-200 days.

Average annual precipation is between 42-44 inches fairly evenly distributed throughout the year at 3-4 inches per month. June and July are somewhat drier, averaging 2.9 and 2.7 inches respectively. Snowfall is highly variable from one year to the next but averages below 30" per year. Generally snow does not remain on the ground for extended periods of time.

4. Biology

a. Plants

Preliminary vegetative species list for acquatic areas proposed for inclusion in the Waquoit Bay National Estuarine Sanctuary:

Algae

Green algae

Cladaphora sp.
Codium fragile
Entermopha intestinalis
Enteromorpha plumosa
Ulva lactuca

Brown algae

Ascophylum nodosum
Fucus spiralis
Fucus resiculosus
Sargarssum filipendula
Laminaria agardhii

Red algae

Agardhiella tenera
Chondrus crispus
Polysiphonia urceolata

Vascular Plants

Zostera marina

Table 2: Preliminary Vegetative Species List - Marsh and Upland Areas

Common Name	Scientific Name	Fresh-Water Marsh	Salt-Water Marsh	Beach/ Barrier Beach	Mixed Hard-woods	Mixed Oak/ Aspen	Pine Scrub	Pine Grass	Open	Dense Pine
Marsh Elder	Iva frutescens		x	x						
Willow	Salix sp.			x						
Saltmarsh Cord Grass	Spartina alterniflora		x							
Saltmarsh Hay	Spartina patens		x							
Freshwater Cordgrass	Spartina pectinata							x		
Broom-Beardgrass	Andropogon scoparius							x	x	
Beardgrass	Andropogon sp.							x	x	
Hairgrass	Deschampsia flexuosa						x	x	x	
Spikegrass	Distichlis spicata		x							
Dune Grass	Ammophila breviligulata			x				x	x	
Sedges	Carex sp.	x								
Rushes	Juncus sp.	x								
Cattail	Typha angustifolia,letifolia	x								
Virginia Creeper	Parthenocissus quinquefolia				x	x	x	x	x	
Common Greenbrier	Smilax rotundifolia						x	x	x	
Glaucous Greenbrier	Smilax glauca						x	x	x	
Grape	Vitis sp.					x				
Bearberry	Arctostaphylos uva-ursi			x			x	x	x	
Sphagnum Moss	Sphagnum sp.	x								
Cranberry	Vaccinium macrocarpon	x								
Sundew	Drosera rotundifolia	x								
Thread-leaved sundew	Drosera filiformis	x								
Three square sedge	Scirpus americanus	x								
Marsh fern	Dryopteris thelypteris	x								
Yarrow	Achillea millefolium						x		x	
Daisy	Chrysanthemum leucanthemum						x			
Wild Carrot	Daucus carota						x		x	
Ragweed	Ambrosia artemisifolia						x		x	
Mullien	Verbascum thapsus						x		x	
Salt Marsh Aster	Aster enuifolius						x	x		
Late Purple Aster	Aster patens						x	x		
Blazing Star	Liatris sp.						x	x		
Chicory	Cichorium intybus						x		x	

Table 2 continued

Common Name	Scientific Name	Fresh-Water Marsh	Salt-Water Marsh	Beach/ Barrier Beach	Mixed Hard-woods	Oak/ Aspen	Pine Scrub	Pine Grass	Open	Pine
Pitch Pine	Pinus rigida			x	x	x	x	x	x	x
Black Oak	Quercus velutina				x	x	x		x	x
Scarlet Oak	Quercus cocinea				x	x	x		x	
White Oak	Quercus alba	x			x		x			
Scrub Oak	Quercus ilicifolia			x	x	x	x	x	x	x
Post Oak	Quercus stellata						x		x	
Red Oak	Quercus rubra				x	x				
Red Maple	Acer rubrum	x								
Black Locust	Robinia pseudo-acacia				x					
Black Gum	Nyssa sylvatica	x								
Quacking Aspen	Populus tremuloides				x	x				
Red Cedar	Juniperus virginia			x			x	x	x	
Sassafras	Sassafras albidum				x					
Grey Birch	Betula populifolia				x					
Black Cherry	Prunus serotina	x			x					
Chokecherry	Prunus virginiana				x		x			
Beach Plum	Prunus maritima			x				x		
Rose	Rosa rugosa			x						
Bayberry	Myrica pensylvanica			x			x	x	x	
Lowbush Blueberry	Vaccinium vacillans				x				x	x
Highbush Blueberry	Vacccinium corymbosum	x					x		x	x
Black Huckleberry	Gaylussacia baccata	x								
Swamp Azalea	Rododendron viscosum	x								
Pink Azalea	Rhodoendron nudiflorum	x								
Coast Pepperbush	Clethra alnifolia			x	x	x				
Winged Sumac	Rhus copallina				x	x				
Staghorn Sumac	Rhus typhina				x	x				
Poison Ivy	Rhus radicans	x		x	x	x	x	x	x	
Wiinterberry	Ilex verticillata	x								
Inkberry	Ilex glabra							x		
Buckthorn	Rhamnus frangula	x								
Groundsel-tree	Baccharis halimiifolia		x	x						
Northern Wild Raisin	Viburnum cassinoides	x								

Table 2 continued

Common Name	Scientific Name	Fresh-Water Marsh or swamp	Salt-Water Marsh	Beach/ Barrier Beach	Mixed Hard-woods	Oak/ Aspen	Pine Scrub	Pine Grass	Open	Pine
Starflower	Trientalis borealis				x					
Blue Flag Iris	Iris versicolor	x								
Pink Ladyslipper	Cypripedium accule				x					
St. Johnswort	Hypercum perforatum	x								
Wild Sarsaparilla	Aralia nudicaulis				x					
Canada Mayflower	Maianthemum canadense				x					x
Wintergreen	Gaultheria procumbens				x				x	x
Spotted Wintergreen	Chimaphila maculata				x				x	x
Trailing Arbutus	Epigaea repens				x					
Solomon's Seal	Polygonatum pubescens									
Indian Pipe	Monotropa uniflora				x				x	x
Sweetfern	Comptonia perearina					x	x		x	
Seaside Goldenrod	Solidago sempervirens			x			x	x	x	
Goldenrods	Solidago sp.			x			x	x	x	
Beach Peal	Lathyrus japonicus			x						
Sea Rocket	Cakile edentula			x						
Common Saltwort	Salsola Kali			x						
Seabeach Sandwort	Arenaria peploides			x						
Seaside Spurge	Euphorbia polygonifolia			x						
Dusty Miller	Artemesia stellariana			x						
Tall Wormwood	Artemesia caudata			x						
Glassworts	Salicornia europaea, bigelovii, virginica		x	x						
Sea Lavender	Limonium nashii		x							
Marsh Rosemary	Limonium Carolinianum		x							
Phrasmiter	Phragmites communis	x								
Rose Shadbush	Amelanchir canadensis	x								
Red Chokeberry	Pyrus arbitifolia	x								
Fragrant waterlily	Nymphaea odorata	x								

b. Shellfish

Marine invertebrates living in the proposed Waquoit Bay National Estuarine Sanctuary:

Common Name	Scientific Name
Molluscs	
Slipper Shell	*Crepidula fornicata*
Slipper Limpet	*Crepidula plana*
Common Periwinkle	*Littorina littorea*
Moon Snail	*Lunatia heros*
Soft Shelled Clam	*Mya arenaria*
Quahog	*Mercenaria mercenaria*
Ribbed Mussel	*Modiolus demissus*
Jingle Shell	*Anomia simplex*
Blood Ark	*Andara osalis*
Common Mussel	*Mytilus edulis*
Bay Scallop	*Aequipecten irradians*
Razor Clam	*Ensis directus*
Moon Snails	*Polinices duplicatus*
Knobbled Whelk	*Busycon carica*
Channeled Whelk	*Busycon canalialatum*
Sea Clam	*Mactra solidissima*
American oyster	*Crassostrea virginica*
Lunar dove-shell	*Mitrella lunata*
Thick-lipped drill	*Eupleura candata*
Oyster drill	*Urosalpinx cinerea*
Eastern Mud Snail	*Nassarius obsoletus*
Stimpson's surf clam	*Spisula polynyma*
Atlantic surf clam	*Spisula solidissima*
Morton's egg cockle	*Laevicardium mortoni*
False angel wing	*Petricola pholadiformis*
Gem clam	*Gemma gemma*
Arthropods	
Barnacle	*Balanus sp.*
Blue crab	*Callinectes sapidus*
Mole crab	*Emerita talpoida*
Horseshoe crab	*Limulus polyphemus*
Spider crab	*Limulus polyphemus*
Green crab	*Carcinus maenas*
Hermit crab	*Pagurus longicarpus*
Decapods	
Squid	*Loligo paelci*

c. Fish

Preliminary list of fish species taken from Waquoit Bay and its connecting waters proposed for inclusion within the Waquoit Bay National Estuarine Sanctuary:

Family Clupeidae

Alosa aestivalis (Mitchill) - blueback herring
Alosa pseudoharengus (Wilson) - alewife
Brevoortia tyrannus (Latrobe) - Atlantic menhaden

Family Salmonidae

Salvelinus fontinalis (Mitchill) - brook trout

Family: Osmeridae

Osmerus mordax (Mitchill) - rainbow smelt

Family: Cyprinidae

Notemigonus crysoleucas (Mitchill) - golden shiner

Family: Catostomidae

Catostomus commersoni (Lacepede) - white sucker

Family: Anguillidae

Anguilla rostrata (LeSueur) - American eel

Family: Belonidae

Strongylura marina (Walbaum) - Atlantic needlefish

Family: Cyprinodontidae

Cyprinodon variegatus (Lacepede - sheepshead minnow
Fundulus diaphanus (LeSueur) - banded killifish
Fundulus heteroclitus (Linnaeus) - mummichog
Fundlus majalis (Walbaum) - striped killifish
Lacania parva (Baird) - rainwater killifish

Family: Atherinidae

Menidia beryllina (Cope) - tidewater silverside
Menidia mendidia (Linnaeus) - Atlantic silverside

Family: Gadidae

Gadus morhua (Linnaeus) - Atlantic cod
Microgadus tomcod (Walbaum) - Atlantic tomcod
Pollachius virens (Linnaeus) - pollock
Urophycis tenuis (Mitchill) - white hake

Family: Gasterosteidae

Apeltes quadracus (Mitchill) - fourspine stickleback
Gasterosteus aculeatus (Linnaeus) - threespine stickleback
Gasterosteus wheatlandi (Putnam) - blackspotted stickleback
Pungitius pungitius (Linnaeus) - ninespine stickleback

Family: Syngnathidae

Syngnathus fuscus (Storer) - northern pipefish

Family: Serranidae

Centropristis striata (Linnaeus) - black seabass

Family: Percichthyidae

Morone americana (Gmelin) - white perch
Morone saxatilis (Walbaum) - striped bass

Family: Percidae

Etheostoma nigrum (Rafinesque) - Johnny darter

Family: Pomatomidae

Pomatomus saltatrix (Linnaeus) - bluefish

Family: Sciaenidae

Menticirrhus saxitilis (Block and Schneider) - northern kingfish

Family: Sparidae

Stenotomus chrysops (Linnaeus) - scup

Family: Labridae

Tautoga onitus (Linnaeus) - tautog
Tautogolabrus adspersus (Walbaum) - cunner

Family: Triglidae

Prionotus carolinus (Linnaeus) - northern searobin
Prionotus evolans (Linnaeus) - striped searobin

Family: Cottidae

Myoxocephalus aenaeus (Mitchill) - grubby
Myoxocephalus octodecemspinosus (Mitchill) - longhorn sculpin

Family: Cycolpeteridae

Cycolperus lumpus (Linnaeus) - lumpfish

Family: Ammodytidae

Ammodytes americanus (Dekay) - American sand lance

Family: Pholidae

Pholis gunnellus (Linnaeus) - rock gunnel

Family: Mugillidae

Mugil cephalus (Linnaeus) stripped mullet

Family: Bothidae

Paralichthys dentatus (Linnaeus) - summer flounder

Family: Pleuronectidae

Pseudopleuronectes americanus (Walbaum) - winter flounder

Order: Tetraodontiformes

Family: Tetraodontidae

Sphaeroides maculatus (Bloch & Schneider) - northern puffer

Order: Batrachoidiformes

Family: Batrachoididae

Opsanus tau (Linnaeus) - oyster toadfish

Categories of fish noted in the proposed Waquoit Bay National Estuarine Sanctuary:

1. Fresh water fishes that occasionally enter brackish waters:

banded killifish	golden shiner
brook trout	johnny darter
white sucker	

2. Truly estuarine species which spend their entire lives in the estuary:

Atlantic silverside	ninespine stickleback
fourspine stickleback	northern pipefish
mummichog	oyster toadfish
rainwater killifish	sheepshead minnow
threespine stickleback	tidewater silverside
blackspotted stickleback	

3. Anadromous and catadromous fish species:

alewife	striped bass
American eel	white perch
rainbow smelt	blueback herring

4. Marine species which pay regular seasonal visits to the estuary usually as adults:

American sand lance	northern kingfish
Atlantic needlefish	northern puffer
striped mullet	northern searobin
grubby	striped searobin
longhorn sculpin	summer flounder
	scup

5. Marine species which use the estuary primarily as a nursery ground usually spawning and spending much of their adult life at sea, but often returning seasonally to the estuary:

Atlantic menhaden	tautog
Atlantic tomcod	white hake
cunner	winter flounder

6. Adventitious visitors, which appear irregularly and have no apparent estuarine requirements:

Atlantic cod	lumpfish
black seabass	pollock
bluefish	rock gunnel

d. Birds

A preliminary listing of bird species found at the proposed Waquoit Bay National Estuarine Sanctuary:

Common Loon	Merganser species
Red throated Loon	Hawks
Various varieties of Grebes	Bob-White Quail
Sheerwater Species	Pheasant
American Egret	Rail species
Snowy Egret	Plover species
Green Heron	Ruddy Turnstone

Black Crowned Night Heron
American Bittern
Mute Swan
Common Canada Goose
American Brant
Mallard and Black Ducks
Baldpate Duck
Green and Blue-Winged Teal
Greater and Lesser Scaup
Golden Eye Duck
Buffle-head Duck
Scoter species
Sandpiper species
Yellow legs
Owls, various species
Flickers
Gulls, various species
Song birds
Whip-Poor-will
Catbird
Blackbird
Yellow Warbler
Common Yellow throat
Eider

A checklist of Massachusetts breeding birds in the Waquoit Bay vicinity:*

Species	Code	Species	Code
Green Heron	PRobable	Eastern Kingbird	PO
Snowy Egret	COnfirmed	Horned Lark	CO
Mute Swan	POssible	Tree Swallow	PR
Canada Goose	CO	Barn Swallow	PR
Mallard	CO	Blue Jay	CO
Black Duck	CO	Common Crow	CO
Osprey	PR	Black-capped Chickadee	CO
Ruffed Grouse	PO	White-breasted Nathatch	PO
Bobwhite	CO	Brown Creeper	PO
Ring-neck Pheasant	PR	Grey Catbird	CO
Piping Plover	CO	Brown Thrasher	PO
Killdeer	PO	American Robin	CO
Spotted Sandpiper	CO	Eastern Bluebird	PO
Great Black-backed Gull	PO	Starling	CO
Herring Gull	PO	Common Yellowthroat	PR
Laughing Gull	PO	House Sparrow	CO
Common Tern	CO	Red-winged Blackbird	CO
Least Tern	CO	Northern Oriole	CO
Rock Dove	CO	Common Grackle	PR
Mourning Dove	CO	Brown-headed Cowbird	PR
Whip-poor-will	PO	Cardinal	PO
Belted Kingfisher	PR	Purple Finch	PO
Common Flicker	CO	House Finch	CO
Downy Woodpecker	PO	American Goldfinch	PR
Savannah Sparrow	CO	Rufous-sided Towhee	CO

* "Massachusetts Breeding Bird Atlas Project", Massachusetts Audubon Society, (unpublished).

e. Mammals

A preliminary listing of mammal species found at the proposed Waquoit Bay National Estuarine Sanctuary:

Various Species of Moles
Shrews
Bats
Skunk
Red Fox
Red and Gray Squirrels
Chipmunk
Muskrat
Cotton tail rabbit
Deer
Racoon
Woodchuck

f. Rare, Threatened, or Endangered Species

Rare, endangered, or threatened species noted in the proposed Waquoit Bay National Estuarine Sanctuary:

RARE PLANT SPECIES

Name	Common Name	Mass. status	Federal status
Agalinis acuta	Sandplain gerardia	Critically endangered throughout range	Considered for listing as Threatened under ESA, (Category 1).
Heliathemum dumosum	Bushy Rockrose	Threatened throughout range	Considered for listing as Threatened under ESA, (Category 2).
Asclepias tuberosa	Butterfly Weed	Apparently secure in state and range.[1]	
Spiranthes tuberosa	Little Ladies' Tresses	Apparently secure in state throughout range.[1]	

1. Recently removed from Division of Fisheries & Wildlife Rare Plant List.

RARE ANIMAL SPECIES

Acipenser brevirostrum[2]	Shortnose Sturgeon	Proposed for listing as Endangered.[3]	Listed as Endangered under ESA.
Sterna antillarum	Least Tern	Proposed for listing as Threatened.[3]	
Malaclemys terrapin	Northern Diamond-back terrapin	Proposed for listing as a Species of Special Concern[3]	

2. Historical occurrence (last verified before 1978).
3. Division of Fisheries & Wildlife Rare Animal List currently under revision.

5. Ecosystem

The following is a brief description of the various resource areas found within the proposed Sanctuary boundaries. Collectively they make up the Bay's ecosystem.

Barrier Beach System: The low-lying beach forming South Cape Beach, Dead Neck and the southern segment of Washburn Island protects the estuarine resources within the Waquoit Bay system. Salt water access into the estuary is restricted to the tidal flow through the narrow cut between the east end of Washburn Island and Dead Neck. The barrier beach is undeveloped. Part of South Cape Beach is a recreational beach.

Salt Marsh: There are approximately 316 acres of salt marsh in the Waquoit Bay system. The Mashpee portion of the system has 240 of these acres, most of which surround Hamblin Pond, Jehu Pond, Sage Lot Pond and the head of Great River. Salt marsh acreage on the Falmouth side occurs in small parcels scattered mostly about Washburn Island and the head of Waquoit Bay. Throughout the system these marshes are almost exclusively privately-owned, although the Commonwealth's acquisition of the South Cape Beach and Washburn Island includes the Sage Lot Pond marsh and others, totaling 121 acres. The high productivity of the salt marshes contributes to the food chain of the near shore environment.

Shellfish Beds: The combination of warm shallow water and a sand mud sediment provides ideal conditions for an abundance of shellfish in the estuary. In order of economic importance, quahogs, bay scallops and soft shelled clams are harvested recreationally and commercially. Shellfishing provides the primary source of income to those who use the estuary for economic purposes. Both Falmouth and Mashpee recognize the need to protect and maintain this valuable resource. Long-standing programs of propagation and predator control are ongoing.

Anadromous and Catadromous Fish Run: The Quashnet River, stretching to Johns Pond in Mashpee, is an important alewife run. American eel, rainbow smelt, blueback herring, stripped bass and white perch are also found within the system.

Erosion and Accretion Areas: Moderate erosion occurs along the length of South Cape Beach and the western half of Washburn Island. Stone groins were constructed on the tidal flat at the western end of Washburn in the 1930's by the Division of Waterways to trap easterly-moving sand. These groins have now decayed to the point where they are no longer effective, and the beach continues to retreat. The eastern portion of Washburn fronting the Sound experiences accretion, but this buildup of sand does not seem to have seriously affected the entrance channel to Waquoit Bay.

Dunes: Sand dunes are found on both Dead Neck and the eastern end of Washburn Island. The Dead Neck dunes are more extensive and are currently under the management of the South Cape Beach State Park.

Beach: South Cape Beach has long been recognized as one of Cape Cod's finest sandy beaches by both summer visitors and permanent residents. It is also a prime surfcasting area for fishermen when bluefish are running. Motor vehicle access is presently limited to an ungraded extension of Great Oak Road in Mashpee.

Estuary: The Waquoit Bay estuarine system is composed of interconnected water bodies, including Waquoit Bay, Hamblin Pond, Jehu Pond and Sage Lot Pond. Fresh water enters the system through the Quashnet River, which originate at Johns pond and through Red Brook; Little River, which flows from Hamblin Pond and through Red Brook; and Great River, from Jehu Pond. The waters are classified SA (suitable for propagation of aquatic life, primary and secondary contact recreation, and shellfish harvesting without depuration) by the Division of Water Pollution Control. Under the antidegradation provisions of the Water Quality Standards, the waters are futhur classified as 4.2, Protection of High Quality Waters.

Significant Scenic Site: The striking scenic quality of the Waquoit Bay area is due to the remaining open land which surrounds much of the Bay. The entire western and southern shores of Waquoit Bay are composed of the undeveloped stretches of Washburn Island and Dead Neck. In addition, there is a magnificent view of the headlands of Martha's Vineyard, five miles distant across Vineyard Sound.

Fish Spawning and Nursery Area: Many species of finfish utilize the warm water and nutrient-rich conditions of this estuary as a spawning and nursery ground. In addition to the anadromous and catadromous species already mentioned, there are also exclusively marine species that use the estuary, including Atlantic menhaden, Atlantic tomcod, cunner, tautog, white hake and winter flounder. A Massachusetts Division of Marine Fisheries investigating team found that the Waquoit Bay system exhibited the greatest diversity of estuarine finfish species among the nine areas studied in the Commonwealth. The team attributed this abundance to Waquoit's location south of Cape Cod where cold water species from the Gulf of Maine and warm water species from the Mid-Atlantic intermingle.

Wildlife Habitat: An adequate supply of food, water and cover in the Bay area provides an important breeding ground for many species of both land and sea birds.

B. Current Use of Site

1. Hunting

Hunting has traditionally occurred on Washburn Island and South Cape Beach. No hunting occurs at the Swift site because of its small size and developed nature.

Species generally hunted in the Waquoit Bay area include pheasants, rabbits, squirrels, quail, and migratory waterfowl. Seasons and other regulations are set by the Massachusetts Division of Fisheries and Wildlife. For all the above species, seasons occur between October and February. No hunting is allowed on Sundays.

Pheasants have been stocked on South Cape Beach since 1975-76 by the Division of Fish and Wildlife at a level of approximately 120 birds a year. The 1983 season ran from October 20 to November 26. Between October 19 and November 24, 1983, 104 birds were released. An additional 12 birds were released at the close of the season in an effort to re-establish a native population. Hunting activity was heaviest at the beginning of the season with a turnout of 12 to 20 hunters per day on weekdays and approximately 40 hunters the first Saturday. For the rest of the season levels were at 0 to 10 per weekday and 25 to 30 on Saturdays. Most hunting occurred during morning hours with the average hunter stay of approximately 3 hours.

Waterfowl hunting levels in 1983 were low with most activity occurring before 8:00 a.m.

2. Fishing

Considerable recreational (rod and reel) fishing occurs in the lower (southern) end of Waquoit Bay for such species as winter flounder, striped bass, bluefish, tautog, white perch, sea-run brook trout and tomcod. Most of this is done from boats or at the mouth of the Bay on Washburn Island or South Cape Beach.

There is some commercial fishing for eels in the upper parts of the estuary. Fishing is done wih eel pots in warm months and with spears in colder periods.

A springtime run of alewives and blueback herring enters the Bay and goes up the Quashnet River to spawn. Young of the year move down river into the Bay during the summer months.

Local sportfishing groups, in cooperation with the State Division of Fisheries and Wildlife have re-established a population of sea-run brook trout in the Quashnet river. These fish periodically are found in Waquoit Bay.

3. Shellfishing

Shellfishing is done both recreationally and commercially in Waquoit Bay. It is directly managed by the two communities involved under plans approved by the State Division of Marine Fisheries. Species harvested include quahogs, bay scallops, and some soft-shell clams.

The 1983 Town Report for Falmouth lists the following take from that town's portion of the Bay: 410 bushels of soft-shell clams, 2,900 bushels of quahogs, and 250 bushels of bay scallops. Figures for the Mashpee section are not presently available.

4. Boating

Recreational boating is very popular in and around Waquoit Bay and its connecting waterways. There are presently no marinas or heavily-used mooring areas within the proposed Sanctuary. Along the shores of the Metoxit area of Falmouth and the Seconsett and Monomoscoy Islands there are many docks and moorings for small boats. There is a public landing and marina on the Childs River and another public landing on the Seapit River; both of these are outside the proposed boundaries of the Sanctuary. A Town of Mashpee landing is located on the Great River and the South Cape Beach agreement provides for space on the Great River for a Town of Mashpee boat launching facility.

Some of the boating on Waquoit Bay is for commercial shellfishing purposes.

There have been concerns raised in both Falmouth and Mashpee about present and future management of boating. Falmouth is developing a management plan for boating and such related activities as waterskiing. Mashpee is involved in ongoing planning for future needs for mooring areas and accessible waterways.

The shallow nature of the Bay, the size of the mouth and of the connecting waterways and the prohibition against dredging within the boundaries of the Area of Critical Environmental Concern all serve as limiting features on the size and type of boating. It is expected that boating in the Bay will remain principally recreational in nature, with some commercial shellfishermen, and small (below 30-35 feet) in size of craft.

5. Aesthetics

The undeveloped, "pristine" nature of the Bay, Washburn Island and South Cape Beach is enjoyed by many of the visitors to the area as well as nearby residents and townspeople of Falmouth and Mashpee. This appreciation was manifested in both local and statewide support for acquisition of the parcels now included in the State park. People use the area for swimming in the high quality waters, walking the clean beaches, harvesting the uncontaminated shellfish, and viewing the plants and animals of the area in a peaceful and unhurried atmosphere.

6. Housing

There is no housing on Washburn Island and only one summer residence on South Cape Beach. As one of the terms of acquisition for the State park, a continuing tenancy, or life-estate, has been negotiated. At some point in the future, the Commonwealth will acquire complete control of this structure.

Presently no one is inhabiting the Swift Estate that is proposed for acquisition as part of the Sanctuary. Therefore, no residents will be displaced as a result of Sanctuary designation.

7. Archaeological and Historic Interests

The building and grounds of the portion of the Swift Estate proposed for inclusion in the Waquoit Bay National Estuarine Sanctuary are classic examples of rural, coastal Victorian architecture and landscaping. This style evolved at the end of th 1800's around the recreation and tourism influences of wealthy individuals leaving the cities and summering along the coast. Subsequent to designation, it is proposed to explore the potential for nomination of this site to the National Register of Historic Places. In Massachusetts this program is administered for the National Park Service by the State Historical Preservation Office under the auspices of the Massachusetts Historical Commission (a sub-division of the office of the Massachusetts Secretary of State.) Such a listing would make it eligible for potential funding for preservation of National Register properties.

A preliminary historic and archaeologic survey on South Cape Beach identified no areas of special interest. A more intense survey is being developed as part of an upcoming State Environmental Impact Report. Historic reports indicate that the site was used as a summer fishing and hunting encampment for Native American tribes.

A walkover survey of Washburn Island found two areas with historic artifacts along the eastern shore. Further investigation would be required to relate these stone flakes to activities by Native Americans. They could indicate an encampment area or merely a temporary worksite.

Historic maps of Washburn Island show five structures between 1853 and 1910. Evidence of two additional structures was found during a recent (1982) survey.

Evidence of some of these structures can no longer be found because of U.S. Army construction between 1942 and 1945. At that time, military barracks, mess halls, garages and related structures were built as part of the defense effort of World War II.

IV. ENVIRONMENTAL CONSEQUENCES

A. General Impacts

The overall impact of establishing the proposed Waquoit Bay National Estuarine Sanctuary would be environmentally beneficial. Social and economic impacts would be both beneficial and adverse to some degree.

Designation of the Sanctuary would entail minimal development or physical alteration of present environmental conditions beyond what is already proposed as part of South Cape Beach State Park and on Washburn Island. The combination of present Federal, State, and local land-use and regulatory programs and the management plans for the State properties serves to ensure a minimum of environmental disturbance will occur in this area.

Access for traditional uses of the proposed Sanctuary would not be changed. Fishing and shellfishing will continue to be administered by the same authorities and hunting will be under the management of the Department of Environmental Management (DEM). On South Cape Beach, advice and review will be offered by the South Cape Beach State Park Advisory Committee.

A detailed management plan for the Sanctuary will be developed incorporating criteria for the Swift estate and the management plan prepared by DEM for park lands. Adjacent landowners would be unaffected.

B. Specific Impacts

1. Natural Environment

Physical impacts on the natural environment though designation of a National Estuarine Sanctuary in Waquoit Bay would be negligible. Effects of the Education and Research Programs would be beneficial in the long run through a better understanding of the estuary and mangement of its resources.

2. Human Environment

a. Scientific and Educational

It is the goal of the Scientific and Educational Programs to provide the public a better understanding of the resources and interworkings of the estuary. This should benefit the resources of the estuary and help satisfy those curious about the world about them.

b. Public Access

Acquisition of South Cape Beach and Washburn Island has made these once-private lands accessible to the public. The further acquisition of the Swift estate proposed by Sanctuary designation will open another avenue of access to the public. Here the public will not only experience the environment, but will more fully become a part of it, through a better understanding of its workings. For researchers, a guaranteed access will be available along with the support facilities of the Sanctuary Research Program.

c. State and Federal Impacts

Acquisition and management of the Waquoit Bay National Estuarine Sanctuary will have a short-term fiscal impact on the Federal government and the Commonwealth of Massachusetts. Long-term operation of the Sanctuary will be the responsibility of the Commonwealth; however, as discussed above, attempts will be made to investigate alternate funding sources for long-term operations.

Any expenditures are expected to be offset by two non-quantifiable benefits: (1) improved scientific and technical knowledge to be applied toward management practices concerning estuarine resources here and in other areas, and (2) improved intergovernmental coordination in the Bay system as a whole.

C. Unavoidable Adverse Environmental or Socio-Economic Impacts

1. Tax Revenue Loss

Acquisition of the Swift property will result in a limited loss of revenue to the Town of Falmouth. After a proposed sub-division of the Swift property, State acquisition would result in a net loss of approximately $2,500-$3,000 per year in tax income based on 1984 figures. Any future acquisition of marsh areas in Falmouth or Mashpee could result in slight additional tax revenue loss.

2. Pedestrian and Traffic Impacts

Designation is expected to introduce additional people into the Sanctuary and the included park areas under the Research and Educational Programs. It is expected that, with appropriate management plans and implementation, there should be an insignificant effect.

Establishment of a Sanctuary Headquarters at the Swift Estate would increase traffic impacts along Route 28. Initially this would entail only Sanctuary staff and researchers, an expected average of 20 vehicle trips per day. As the educational program develops and displays and information are available for the public, this figure could increase. Evening activities or meetings could produce "pulses" of traffic entering or exiting the facility.

D. Relationship between the Proposed Action on the Environment and the Maintenance and Enhancement of Long-Term Productivity

The expressed purpose of the proposed action is to protect the Waquoit Bay ecosystem in perpetuity and to guarantee long-term stability to the benefit of a large and diverse assemblage of wildlife and fish species. Regulated harvesting of natural resources would continue, but there would be no short-term or exploitative uses at the expense of long-time productivity or continued public utilization. By implication, all short-term uses that would reduce or eliminate long-term productivity would be prevented with the proposed action and intended management.

The proposed action of habitat preservation and resource conservation is conducive to maintaining natural productivity and ecosystem processes with

little or no work or subsidy by man. The natural productive efficiency of estuaries is among the highest of all known natural or artificial systems and is virtually irreplacable.

The protection and management of the area as a natural field laboratory will serve to maintain, and possibly enhance, the ecosystem's productivity in the long term.

E. Irreversible or Irretrievable Commitments of Resources

No irreversible or irretrievable commitments of resources have been identified in the assessment or are expected to result from the proposed action. No reduction in income to the county would result from loss of agricultural production. No other adverse, unavoidable environmental impacts are known. No significant construction is anticipated, except for possible education facilities such as an interpretative center, trails, signs, and small upland parking areas at controlled access points. Other than sport and commercial fish, shellfish, and wildlife harvesting, no extraction of renewable or nonrenewable resources would occur. Endangered, threatened, and sensitive species and their vital habitats would be protected, as would any known or discovered archeological or historical sites.

Minor maintenance and energy expenditures would be incurred, as would the expenditure of public funds. These may be regarded as a commitment of economic resources and also as an investment in recreation amenities for the welfare of present and future generations.

F. Possible Conflicts Between the Proposed Action and the Objectives of Federal, State, Regional, and Local Land-use Plans, Policies and Controls for the Area Concerned

No conflicts have been noted in the assessment used to develop the proposed Sanctuary designation. By incorporating existing local, State, and Federal regulatory, land-use, and resource management programs, it is intended that the Sanctuary operation will carefully fit into its natural and legal environment.

PART V: LIST OF PREPARERS

WASHINGTON, D.C.

Mr. Arthur E. Jeffers,	Project Manager Sanctuary Programs Division National Ocean Service National Oceanic and Atmospheric Administration Washington, D.C.
Ms. Sherrard C. Foster,	Assistant Project Manager Sanctuary Programs Division

MASSACHUSETTS

Mr. Stephen Bliven,	Coastal Biologist and Planner Coastal Zone Management Office Massachusetts Executive Office of Environmental Affairs Boston, Massachusetts
Mr. Gary Clayton,	Deputy Director Coastal Zone Management Office
Mr. Harry Dodson,	Planner Department of Environmental Management
Ms. Ruth Helfeld,	Planner Department of Environmental Management
Mr. Jack Clarke,	Cape Cod Planning and Economic Development Commission

PART VI: LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES

Federal Agencies

Advisory Council of Historic Preservation
Department of Agriculture
Department of Commerce
Department of Defense
Department of Energy
Department of Health and Human Services
Department of the Interior
Department of Justice
Department of Labor
Department of Transportation - U.S. Coast Guard
Environmental Protection Agency
Permits Branch, Region 1, Environmental Protection Agency
Federal Energy Regulatory Commission
General Services Administration
Nuclear Regulatory Commission

National Interest Groups

AFL-CIO
American Association of Port Authorities
American Bureau of Shipping
American Fisheries Society
American Gas Association
American Shore and Beach Preservation Association
American Society of Planning Officials
American Waterways Operations
Amoco Production Company
Atlantic Richfield Company
Boating Industry Association
Center for Environmental Education
Center for Law and Social Policy
Center for Urban Affairs
Center for Urban and Regional Resources
Chamber of Commerce of the United States
Chevron U.S.A., Inc.
Cities Service Company
Congressional Research Service
Conservation Foundation
Continental Oil Company
Council of State Planning Agencies
CZM Newsletter
Defenders of Wildlife
Environmental Policy Center
Environmental Defense Fund, Inc.
Environmental Law Institute
Exxon Company, U.S.A.
Friends of the Earth

Gulf Oil Company
Gulf Refining Company
Institute for the Human Environment
Interstate Natural Gas Association of America

National Interest Groups (cont.)

Marathon Oil Company
Marine Mammal Commission
Marine Technology Society
Mobil Oil Corporation
National Association of Conservation Districts
National Association of Home Builders
National Audubon Society
National Fisheries Institute
National Forest Products Association
National Marine Manufacturers Association
National Ocean Industries Association
National Research Council
National Society of Professional Engineers
National Waterways Conference
National Wildlife Federation
National Wildlife Federation Wetlands Center
Natural Resources Defense Council
Natural Resources Law Institute
Norfolk Dredging Company
Outboard Marine Corporation
Sierra Club
Soil Conservation Society of America
Standard Oil Company of Ohio
State University Law School of New York
State University of New York
Sun Company, Inc.
Tenneco Oil Company
Texaco, Inc.
Texas A & M University
Transcentury Corporation
Union Oil Company of California
United Mobile Sport Fisherman
University of Pittsburgh
University of Washington, Institute for Marine Studies
Urban Research and Development Association, Inc.
Western Oil and Gas Association
Wildlife Management Institute
Woods Hole Oceanographic Institute

United States Senators

The Honorable Edward M. Kennedy
The Honorable Paul E. Tsongas

United States Representatives

The Honorable Gerry E. Studds

Massachusetts State Government

The Honorable Michael S. Dukakis, Governor

Executive Office of Environmental Affairs

Environmental Impact Review (MEPA)

Commissioner
Department of Environmental Management

Office of Planning
Department of Environmental Management

Bureau of Recreation
Department of Environmental Planning

Forests and Parks Division
Department of Environmental Management

Acquisition Division
Department of Environmental Management

Engineering Division
Department of Environmental Management

Planning Division
Department of Environmental Management

Region I
Department of Environmental Management

South Cape Beach State Park
Department of Environmental Management

Commissioner
Department of Fisheries, Wildlife and Recreational Vehicles

Fisheries and Wildlife Division
Department of Fisheries, Wildlife and Recreational Vehicles

Non-Game Endangered Species
Department of Fisheries, Wildlife and Recreational Vehicles

Natural Heritage Program
Department of Fisheries, Wildlife and Recreational Vehicles

Division of Marine Fisheries
Department of Fisheries, Wildlife and Recreational Vehicles

Division of Marine Fisheries
Department of Fisheries, Wildlife and Recreational Vehicles

Research and Management
Department of Fisheries, Wildlife and Recreational Vehicles

Commissioner
Department of Environmental Quality Engineering

Division of Wetlands and Waterways Regulation
Department of Environmental Quality Engineering

Southeast Region
Department of Environmental Quality Engineering

Director
Massachusetts Coastal Zone Management Office

Cape and Islands Senatorial District
Massachusetts Historical Commission

Coastal Resources Advisory Board
Cape Cod Citizens Advisory Committee

Cape Cod Planning and Economic Development Commission

South Cape Beach State Park Advisory Committee

State Senator

Paul V. Doane, Cape Cod and Islands Senatorial District

Local Officials

Town of Falmouth

Board of Selectmen

Planning Board

Conservation Commission

Board of Health

Harbormaster

Shellfish Warden

Waterways Committee

Department of Public Works

Conservation Department

Town of Mashpee

Board of Selectmen

Planning Board

Conservation Commission

Board of Health

Harbormaster

Recreation Director

Shellfish Officer

Waterways Advisory Committee

State, Regional and Local Environmental Organizations

Massachusetts Association of Conservation Commissions

Massachusetts Audubon Society

Association for the Preservation of Cape Cod

Citizens for the Protection of Waquoit Bay

Wellfleet Audubon Sanctuary

New Alchemy Institute

Environmental Lobby of Massachusetts

Nature Conservancy

Conservation Law Foundation of New England

Trustees of Reservations

Sierra Club

Scientific and Educational Organizations

Provincetown Center for Coastal Studies

Cape Cod Museum of Natural History

Sea Grant Office - Woods Hole Oceanographic Institution

Coastal Research Center - Woods Hole Oceanographic Institution

Cape Cod Community College

Lloyd Center for Environmental Studies, So. Dartmouth, MA

NEED Collaborative (Falmouth, Dennis, Yarmouth, Harwich School Systems)

Other Regional or Local Groups

The New Seabury Corporation

Edwards Boatyard Inc.

The Waquoit Association

Precinct 7 (Falmouth) Organization

Waquoit Shellfish Corporation

Waquoit Bay Yacht Club

Menauhant Yacht Club

Individual Landowners

Nancy S. Pfeiffer

Harris Douglas Moore

Francis Southwick

Kathryn V. Wood

Guiseppe Durso

Henry Spohr

Ruth E. Witkus

Robert DeVoe

Edward S. Anderson

Albert V. Lawton

Joseph J. McGrath

Ronald Bourque

Francis B. Ellis

John L. Venckus

New Seabury Corporation

John J. Moore

Richard E. Ball

John W. Atkinson

Donald Koslow

Joseph Biknaitis

Albert W. Whitmore

Steven R. Ball

Arthur F. Koch

Red Brook Corporation

Jennie E. James

Earl H. Hutt

Louis M. McMenany

Mary B. Bingham

John F. Stanton

Richard J. Breivogel

Joseph R. Uzmann

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APPENDIX 1

National Estuarine Program Regulations - 1974, 1977 and 1984

federal register

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PART IV

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

■

Estuarine Sanctuary Guidelines

Title 15—Commerce and Foreign Trade

CHAPTER IX—NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE

PART 921—ESTURAINE SANCTUARY GUIDELINES

The National Oceanic and Atmospheric Administration (NOAA) on March 7, 1974, proposed guidelines (15 CFR Part 921) pursuant to section 312 of the Coastal Zone Management Act of 1972 (Pub. L. 92-583, 86 Stat. 1280), hereinafter referred to as the "Act," for the purpose of establishing the policy and procedures for the nomination, selection and management of estuarine sanctuaries.

Written comments were to be submitted to the Office of Coastal Environment (now the Office of Coastal Zone Management), National Oceanic and Atmospheric Administration, before April 8, 1974, and consideration has been given those comments.

The Act recognizes that the coastal zone is rich in a variety of natural, commercial, recreational, industrial and esthetic resources of immediate and potential value to the present and future well-being of the nation. States are encouraged to develop and implement management programs to achieve wise use of the resources of the coastal zone, and the Act authorizes Federal grants to the States for these purposes (sections 305 and 306).

In addition, under section 312 of the Act, the Secretary of Commerce is authorized to make available to a coastal State grants of up to 50 per centum of the cost of acquisition, development and operation of estuarine sanctuaries. The guidelines contained in this part are for grants under section 312.

In general, section 312 provides that grants may be awarded to States on a matching basis to acquire, develop and operate natural areas as estuarine sanctuaries in order that scientists and students may be provided the opportunity to examine over a period of time ecological relationships within the area. The purpose of these guidelines is to establish the rules and regulations for implementation of this program.

The National Oceanic and Atmospheric Administration is publishing herewith the final regulations describing the procedures for applications to receive grants for estuarine sanctuaries under section 312 of the Act. The final regulations and criteria were revised from the proposed guidelines based on the comments received. A total of fifty (50) States, agencies, organizations and individuals submitted responses to the proposed section 312 guidelines published in the FEDERAL REGISTER on March 7, 1974. Of those responses received, eight (8) offered no comment or were wholly favorable as to the nature and content of the guidelines as originally proposed. Forty-two (42) commentators submitted suggestions concerning the proposed section 312 guidelines.

The following summary analyzes key comments received on various sections of the proposed regulations and presents the rationale for the responses made.

Section 921.2 *Definitions.* Three comments requested that the term "estuary" be defined. Although the term is defined in the Act and also in the regulations dealing with Coastal Zone Management Program Development Grants (Part 920 of this chapter) published November 29, 1973, it has been added to these regulations and broadened slightly to include marine lagoons with restricted freshwater input such as might occur along the south Texas coast.

Two other comments requested that the "primary purpose" referred to in § 921.2(b) be clearly defined. Although elaborated upon in § 921.3(a), for the purpose of clarity this change has been made.

Section 921.3 *Objectives and Implementation.* Several comments suggested that the estuarine sanctuary program objectives were too narrowly defined and specifically that they should be broadened to include the acquisition and preservation of unique or endangered estuaries for wildlife or ecological reasons. Although the Act (section 302) declares it the nation's policy to preserve, protect, develop, and where possible, to restore or enhance coastal resources, this is perceived to be achievable through State actions pursuant to sections 305 and 305. While it is recognized that the creation of an estuarine sanctuary may in fact serve to preserve or protect an area or biological community, the legislative history of section 312 clearly indicates the estuarine sanctuary program was not intended to duplicate existing broad purpose Federal preservation programs, such as might be accommodated by use of the Land and Water Conservation Fund Act. Instead, both in the Act as well as its legislative history, the objective is defined as preserving representative estuarine areas for long-term research and educational uses.

Three other comments suggested the objectives of the program should be enlarged to include the restoration of environmentally degraded areas. This, too, is perceived to be a State requirement separate from section 312. In addition, adequate authority for restoring degraded water areas now exists (for example, Pub. L. 92-500 in addition to sections 302, 305 and 306 of the Act). No significant additional benefit would appear to result from declaring an area an estuarine sanctuary for the purposes of restoration.

A few comments indicated that the examples of sanctuary use were too heavily weighted toward scientific uses to the exclusion of educational uses. Public education concerning the value and benefits of, and the nature of conflict within the coastal zone, will be essential to the success of a coastal zone management program. The section has been changed to reflect an appropriate concern for educational use.

Some commentators suggested changes in or additions to the specific examples of sanctuary uses and purposes. These examples were taken from the Senate and House Committee Reports and are considered sufficient to reflect the kinds of uses intended within an estuarine sanctuary.

Several comments were received pertaining to § 921.3(c) involving the restrictions against overemphasis of destructive or manipulative research. Ten comments indicated that the section was too weak and would not provide sufficient long-term protection for the sanctuary ecosystem. Several commentators specifically recommended deleting the words "would not normally be permitted" and inserting in their place "will not be permitted." In contrast, three respondents indicated that the potential use of estuarine sanctuaries for manipulative or destructive research was too restricted, and that these uses should be generally permitted if not encouraged.

The legislative history of section 312 clearly indicates that the intent of the estuarine sanctuary program should be to preserve representative estuarine areas so that they may provide long-term (virtually permanent) scientific and educational use. The uses perceived are compatible with what has been defined as "research natural areas." In an era of rapidly degrading estuarine environments, the estuarine sanctuary program will ensure that a representative series of natural areas will be available for scientific or educational uses dependent on that natural character, for example, for baseline studies, for use in understanding the functioning of natural ecological systems, for controls against which the impacts of development in other areas might be compared, and as interpretive centers for educational purposes. Any use, research or otherwise, which would destroy or detract from the natural system, would be inappropriate under this program.

In general, the necessity of or benefit from permitting manipulative or destructive research within an estuarine sanctuary is unclear. While there is a legitimate need for such kinds of research, ample opportunity for manipulative or destructive research to assess directly man's impact or stresses on the estuarine environment exists now without the need for creation or use of an estuarine sanctuary for this purpose. In contrast, a clear need exists for natural areas to serve as controls for manipulative research or research on altered systems.

The section on manipulative research has been changed to reflect the concern for continued maintenance of the area as a natural system. However, the modifier "normally" has been retained because, within these limits, it is not felt necessary to preclude all such uses; the occasion may rarely arise when because of a thoroughly demonstrated direct benefit, such research may be permitted.

Several comments suggested that the program should include degraded estuarine systems, rather than be limited to areas which are "relatively undisturbed by human activities." Such areas would permit research efforts designed to restore an estuarine area. As indicated

above, an ample legislative mandate to restore environmentally degraded areas already exists; the benefits to be derived from declaring such areas estuarine sanctuaries would be marginal. Indeed, it would appear that if restoration efforts cannot occur without estuarine sanctuary designation, then, given the limited resources of this program, such efforts would not be feasible.

A few commentators suggested that the phrase (§ 921.3(e)) "if sufficient permanence and control by the State can be assured, the acquisition of a sanctuary may involve less than the acquisition of a fee simple interest" be more clearly defined. Explanatory language has been added to that section.

Section 921.4 *Zoogeographic Classification.* Because the classification scheme utilized plants as well as animals, two commentators suggested that zoogeographic be changed to biogeographic. This change is reflected in the final regulations.

One comment suggested that selection of sanctuaries should depend on the pressures and threats being brought to bear upon the natural areas involved even if this meant selecting several sanctuaries from one classification and none from another.

The legislative history of section 312 clearly shows the intent to select estuarine sanctuaries on a rational basis which would reflect regional differentiation and a variety of ecosystems. The biogeographic classification system, which reflects geographic, hydrographic, and biologic differences, fulfills that intention. A scheme which would abandon that system, or another similar one, and would not fulfill the requirements of providing regional differentiation and a variety of ecosystems, would not be consistent with the intended purpose of the Act.

A few comments received suggested that the biogeographic classification scheme be enlarged by the addition of a new class reflecting an area or State of special concern or interest to the respondent. (No two commentators suggested the same area.) It is felt that adequate national representation is provided by the biogeographic scheme proposed, and that the changes offered were in most cases examples of sub-categories that might be utilized.

One comment suggested a specific change in the definition of the "Great Lakes" category. Portions of that suggestion have been incorporated into the final rules.

Two commentators requested assurance that sub-categories of the biogeographic scheme will in fact be utilized. The final language substitutes "will be developed and utilized" for "may be developed and utilized."

Section 921.5 *Multiple Use.* Several comments were received pertaining to the multiple use concept. Three commentators suggested that the multiple use directive was contrary to or absent from the Act and should be omitted. Ten respondents felt the concept should be more explicitly defined and restricted so that the primary purpose of the sanctuary would be more clearly protected. In contrast, two commentators felt that the definition might prove too restrictive and should be broadened. Several commentators suggested that examples of anticipated multiple use might be appropriate.

While recognizing that it is not always possible to accommodate more than a single use in an environmentally sensitive area, it is not the intention to unnecessarily preclude the uses of sanctuary areas where they are clearly compatible with and do not detract from the long-term protection of the ecosystem for scientific and educational purposes. The language of § 921.5 has been changed accordingly.

Section 921.6 *Relationship to Other Provisions of the Act and to Marine Sanctuaries.* Several comments were received which commended and stressed the need for close coordination between the development of State coastal zone management programs, especially and land and water use controls, and the estuarine sanctuary program.

The relationship between the two programs is emphasized: estuarine sanctuaries should provide benefit—both short-term and long-term—to coastal zone management decision-makers; and State coastal zone management programs must provide necessary protection for estuarine sanctuaries. This necessary coordination is discussed not only in the estuarine sanctuary regulations, but will also be addressed in an appropriate fashion in guidelines and rules for Coastal Zone Management Program Approval Criteria and Administrative Grants.

Three commentators discussed the need for swift action by both State and Federal governments to establish and acquire estuarine sanctuaries. The Office of Coastal Zone Management intends to pursue the program as swiftly as available manpower restraints will permit.

A few comments sought reassurance that the estuarine sanctuaries program will in fact be coordinated with the Marine Sanctuaries Program (Title III, Pub. L. 92-532). The guidelines have been changed to reflect that both programs will be administered by the same office.

SUBPART B—APPLICATION FOR GRANTS

Section 921.10 *General.* One reviewer indicated uncertainty about which State agency may submit applications for grants under section 312. Although individual States may vary in the choice of individual agencies to apply for an estuarine sanctuary, because of the necessity for coordination with the State coastal zone management program the entity within the State which is the certified contact with the Office of Coastal Zone Management, NOAA, responsible for the administration of the coastal zone management program must endorse or approve an estuarine sanctuary application.

Appropriate language has been included to ensure this coordination.

Section 921.11 *Initial Application for Acquisition, Development and Operation Grants.* Two comments requested that the source and nature of acceptable matching funds should be explicitly identified.

OMB Circular A-102 generally defines and identifies legitimate "match" for Federal grant projects. In general, reference should be made to that document. However, the section has been expanded in response to some specific and frequent questions.

Two comments stressed the need for increased availability of research funds to adequately utilize the potential of estuarine sanctuaries. While not an appropriate function of the estuarine sanctuary program, the Office of Coastal Zone Management is discussing the necessity of adequate funding with appropriate agencies.

One comment suggested that the term "legal description" of the sanctuary (§ 921.11(a)) is not appropriate for all categories of information requested. The word "legal" has been omitted.

Three reviewers indicated that the Act provides no basis for consideration of socio-economic impacts (§ 921.11(l)) and that this criterion seemed inappropriate to selecting estuarine sanctuaries. Apparently these reviewers misunderstood the intention of this requirement. The information in this section is necessary for preparation of an environmental impact statement which will be prepared pursuant to NEPA. Although required in the application, such information is not a part of the selection criteria, which are addressed in Subpart C, § 921.20.

One similar comment was received with regard to consideration of existing and potential uses and conflicts (§ 921.11(h)). This item is also discussed under selection criteria (§ 921.20(h)). It is intended that this criterion will only be considered when choosing between two or more sanctuary applications within the same biogeographic category which are of otherwise equal merit.

One comment drew attention to an apparent typographic error in § 921.11 (m) where the term "marine estuaries" seems out of context. This has been corrected.

Two commentators suggested that public hearings should be required in the development of an estuarine sanctuary application. Although such a hearing is deemed desirable by the Office of Coastal Zone Management, it would not always seem to be necessary. The language in § 920.11(l) has been changed to reflect the sincere concern for the adequate involvement of the public, which is also addressed under a new § 920.21.

One respondent suggested that a new section be added requiring the applicant to discuss alternative methods of acquisition or control of the area, including the designation of a marine sanctuary, in place of establishing an estuarine sanctuary. A new section (§ 920.11(n)) has been added for this purpose.

Section 921.12 *Subsequent Application for Development and Operation Grants.* Three commentators expressed concern that the intent of § 921.12 be more clearly expressed. Appropriate changes have been made.

One comment was made that a provision should be included to use existing Federally owned land for the purpose of the estuarine sanctuary program. A section has been added for that purpose.

Section 921.20 *Criteria for Selection.* One comment suggested that the consideration of conflict with existing or potential competing uses should not be included as a selection criterion. As discussed above, this criterion is considered appropriate.

Another reviewer suggested the addition of a new criterion, consideration of "the need to protect a particular estuary from harmful development." As discussed earlier, this criterion is not considered appropriate. Such a basis for determining selection would lead to a reactionary, random series of estuarine sanctuaries, rather than the rationally chosen representative series mandated in the legislative history.

Two reviewers commented that the limitation on the Federal share ($2,000,000 for each sanctuary) was too low and would severely restrict the usefulness of the program. However, this limitation is provided by the Act.

Another commentator suggested that § 921.20(g) was unnecessarily restrictive in that it might prevent selecting an estuarine sanctuary in an area adjacent to existing preserved lands where the conjunction might be mutually beneficial. The language of § 921.20(g) does not preclude such action, but has been changed to specifically permit this possibility.

Two commentators inquired whether the reference to a "draft" environmental impact statement (§ 921.20, last paragraph) indicated an intention to avoid further compliance with NEPA. It is the firm intention of the Office of Coastal Zone Management to fully comply in all respects with NEPA. The word "draft" has been struck.

Three reviewers addressed the problems of providing adequate public participation in the review and selection process. In addition to the change in § 920.11(1), a new section has been added to address this issue.

SUBPART D—OPERATION

Section 921.30 *General.* One commentator suggested that during contract negotiations, there should be a meeting between the applicant agency and proposed sanctuary management team, and representatives of the Office of Coastal Zone Management. The general provisions have been broadened to provide for this suggestion.

Two comments were submitted which urged that some discretion be exercised in the use and access to the sanctuary by scientists and students. Two other comments were received which requested specific protection for use by the general public. The guidelines have been changed to include these suggestions.

One comment was received suggesting language to clarify § 921.30(g). This was incorporated into the guidelines.

Two commentators expressed concern for enforcement capabilities and activities to ensure protection of the estuarine sanctuaries. A new section has been added which addresses this issue.

Finally, one suggestion was received that a vehicle for change in the management policy or research programs should be provided. A new section has been added for that purpose.

Accordingly, having considered the comments received and other relevant information, the Secretary concludes by adopting the final regulations describing the procedure for applications to receive estuarine sanctuary grants under section 312 of the Act, as modified and set forth below.

Effective date: June 3, 1974.

Dated: May 31, 1974.

ROBERT M. WHITE,
Administrator.

Subpart A—General

Sec.

921.1 Policy and objectives.
921.2 Definitions.
921.3 Objectives and implementation of the program.
921.4 Biogeographic classification.
921.5 Multiple use.
921.6 Relationship to other provisions of the Act and to marine sanctuaries.

Subpart B—Application for Grants

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921.12 Application for subsequent development and operation grants.
921.13 Federally owned lands.

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921.21 Public participation.

Subpart D—Operation

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921.31 Changes in the sanctuary boundary, management policy or research program.
921.32 Program review.

AUTHORITY: Sec. 312 of the Coastal Zone Management Act of 1972 (Pub. L. 92-583, 86 Stat. 1280).

Subpart A—General

§ 921.1 Policy and Objectives.

The estuarine sanctuaries program will provide grants to States on a matching basis to acquire, develop and operate natural areas as estuarine sanctuaries in order that scientists and students may be provided the opportunity to examine over a period of time the ecological relationships within the area. The purpose of these guidelines is to establish the rules and regulations for implementation of the program.

§ 921.2 Definitions.

(a) In addition to the definitions found in the Act and in the regulations dealing with Coastal Zone Management Program Development Grants published November 29, 1973 (Part 920 of this chapter) the term "estuarine sanctuary" as defined in the Act, means a research area which may include any part or all of an estuary, adjoining transitional areas, and adjacent uplands, constituting to the extent feasible a natural unit, set aside to provide scientists and students the opportunity to examine over a period of time the ecological relationships within the area.

(b) For the purposes of this section, "estuary" means that part of a river or stream or other body of water having unimpared connection with the open sea where the seawater is measurably diluted with freshwater derived from land drainage. The term includes estuary-type areas of the Great Lakes as well as lagoons in more arid coastal regions.

(c) The term "multiple use" as used in this section shall mean the simultaneous utilization of an area or resource for a variety of compatible purposes or to provide more than one benefit. The term implies the long-term, continued uses of such resources in such a fashion that other uses will not interfere with, diminish or prevent the primary purpose, which is the long-term protection of the area for scientific and educational use.

§ 921.3 Objectives and implementation of the program.

(a) General. The purpose of the estuarine sanctuaries program is to create natural field laboratories in which to gather data and make studies of the natural and human processes occurring within the estuaries of the coastal zone. This shall be accomplished by the establishment of a series of estuarine sanctuaries which will be designated so that at least one representative of each type of estuarine ecosystem will endure into the future for scientific and educational purposes. The primary use of estuarine sanctuaries shall be for research and educational purposes, especially to provide some of the information essential to coastal zone management decision-making. Specific examples of such purposes and uses include but are not limited to:

(1) To gain a thorough understanding of the ecological relationships within the estuarine environment.

(2) To make baseline ecological measurements.

(3) To monitor significant or vital changes in the estuarine environment.

(4) To assess the effects of man's stresses on the ecosystem and to forecast and mitigate possible deterioration from human activities.

(5) To provide a vehicle for increasing public knowledge and awareness of the complex nature of estuarine systems, their values and benefits to man and nature, and the problems which confront them.

(b) The emphasis within the program will be on the designation as estuarine sanctuaries of areas which will serve as natural field laboratories for studies and investigations over an extended period. The area chosen as an estuarine sanctuary shall, to the extent feasible, include water and land masses constituting a natural ecological unit.

(c) In order that the estuarine sanctuary will be available for future studies, research involving the destruction of any portion of an estuarine sanctuary which would permanently alter the nature of the ecosystem shall not normally be

permitted. In the unusual circumstances where permitted, manipulative field research shall be carefully controlled. No experiment which involves manipulative research shall be initiated until the termination date is specified and evidence given that the environment will be returned to its condition which existed prior to the experiment.

(d) It is anticipated that most of the areas selected as sanctuaries will be relatively undisturbed by human activities at the time of acquisition. Therefore, most of the areas selected will be areas with a minimum of development, industry or habitation.

(e) If sufficient permanence and control by the State can be assured, the acquisition of a sanctuary may involve less than the acquisition of a fee simple interest. Such interest may be, for example, the acquisition of a conservation easement, "development rights", or other partial interest sufficient to assure the protection of the natural system. Leasing, which would not assure permanent protection of the system, would not be an acceptable alternative.

§ 921.4 Biogeographic classification.

(a) It is intended that estuarine sanctuaries should not be chosen at random, but should reflect regional differentiation and a variety of ecosystems so as to cover all significant variations. To ensure adequate representation of all estuarine types reflecting regional differentiation and a variety of ecosystems, selections will be made by the Secretary from the following biogeographic classifications:

1. *Arcadian.* Northeast Atlantic coast south to Cape Cod, glaciated shoreline subject to winter icing; well developed algal flora; boreal biota.

2. *Virginian.* Middle Atlantic coast from Cape Cod to Cape Hatteras; lowland streams, coastal marshes and muddy bottoms; characteristics transitional between 1 and 3; biota primarily temperate with some boreal representatives.

3. *Carolinian.* South Atlantic coast, from Cape Hatteras to Cape Kennedy; extensive marshes and swamps; waters turbid and productive; biota temperate with seasonal tropical elements.

4. *West Indian.* South Florida coast from Cape Kennedy to Cedar Key; and Caribbean Islands; shoreland low-lying limestone; calcareous sands, marls and coral reefs; coastal marshes and mangroves; tropical biota.

5. *Louisianian.* Northern Gulf of Mexico, from Cedar Key to Mexico; characteristics of 3, with components of 4; strongly influenced by terrigenous factors; biota primarily temperate.

6. *Californian.* South Pacific coast from Mexico to Cape Mendocino; shoreland influenced by coastal mountains; rocky coasts with reduced fresh-water runoff; general absence of marshes and swamps; biota temperate.

7. *Columbian.* North Pacific coast from Cape Mendocino to Canada; mountainous shoreland; rocky coasts; extensive algal communities; biota primarily temperate with some boreal.

8. *Fiords.* South coast Alaska and Aleutians; precipitous mountains; deep estuaries, some with glaciers; shoreline heavily indented and subject to winter icing; biota boreal to sub-Arctic.

9. *Subarctic.* West and north coasts of Alaska; ice stressed coasts; biota Arctic and sub-Arctic.

10. *Insular.* Larger islands, sometimes with precipitous mountains; considerable wave action; frequently with endemic species; larger island groups primarily with tropical biota.

11. *Great Lakes.* Great Lakes of North America; bluff-dune or rocky, glaciated shoreline; limited wetlands; freshwater only; biota a mixture of boreal and temperate species with anadromous species and some marine invaders.

(b) Various sub-categories will be developed and utilized as appropriate.

§ 921.5 Multiple use.

(a) While the primary purpose of estuarine sanctuaries is to provide long-term protection for natural areas so that they may be used for scientific and educational purposes, multiple use of estuarine sanctuaries will be encouraged to the extent that such use is compatible with this primary sanctuary purpose. The capacity of a given sanctuary to accommodate additional uses, and the kinds and intensity of such use, will be determined on a case by case basis. While it is anticipated that compatible uses may generally include activities such as low intensity recreation, fishing, hunting, and wildlife observation, it is recognized that the exclusive use of an area for scientific or educational purposes may provide the optimum benefit to coastal zone management and resource use and may on occasion be necessary.

(b) There shall be no effort to balance or optimize uses of an estuarine sanctuary on economic or other bases. All additional uses of the sanctuary are clearly secondary to the primary purpose and uses, which are long-term maintenance of the ecosystem for scientific and educational uses. Non-compatible uses, including those uses which would cause significant short or long-term ecological change or would otherwise detract from or restrict the use of the sanctuary as a natural field laboratory, will be prohibited.

§ 921.6 Relationship to other provisions of the act and to marine sanctuaries.

(a) The estuarine sanctuary program must interact with the overall coastal zone management program in two ways: (1) the intended research use of the sanctuary should provide relevant data and conclusions of assistance to coastal zone management decision-making, and (2) when developed, the State's coastal zone management program must recognize and be designed to protect the estuarine sanctuary; appropriate land and water use regulations and planning considerations must apply to adjacent lands. Although estuarine sanctuaries should be incorporated into the State coastal zone management program, their designation need not await the development and approval of the management program where operation of the estuarine sanctuary would aid in the development of a program.

(b) The estuarine sanctuaries program will be conducted in close cooperation with the marine sanctuaries program (Title III of the Marine Protection, Research Act of 1972, Pub. L. 92-532, which is also administered by the Office of Coastal Zone Management, NOAA), which recognizes that certain areas of the ocean waters, as far seaward as the outer edge of the Continental Shelf, or other coastal waters where the tide ebbs and flows, or of the Great Lakes and their connecting waters, need to be preserved or restored for their conservation, recreational, ecologic or esthetic values. It is anticipated that the Secretary on occasion may establish marine sanctuaries to complement the designation by States of estuarine sanctuaries, where this may be mutually beneficial.

Subpart B—Application for Grants

§ 921.10 General.

Section 312 authorizes Federal grants to coastal States so that the States may establish sanctuaries according to regulations promulgated by the Secretary. Coastal States may file applications for grants with the Director, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Rockville, Maryland 20852. That agency which has been certified to the Office of Coastal Zone Management as the entity responsible for administration of the State coastal zone management program may either submit an application directly, or must endorse and approve applications submitted by other agencies within the State.

§ 921.11 Application for initial acquisition, development and operation grants.

(a) Grants may be awarded on a matching basis to cover the costs of acquisition, development and operation of estuarine sanctuaries. States may use donations of land or money to satisfy all or part of the matching cost requirements.

(b) In general, lands acquired pursuant to this section, including State owned lands but not State owned submerged lands or bay bottoms, that occur within the proposed sanctuary boundary are legitimate costs and their fair market value may be included as match. However, the value of lands donated to or by the State for inclusion in the sanctuary may only be used to match other costs of land acquisition. In the event that lands already exist in a protected status, their value cannot be used as match for sanctuary development and operation grants, which will require their own matching funds.

(c) Development and operation costs may include the administrative expenses necessary to monitor the sanctuary, to ensure its continued viability and to protect the integrity of the ecosystem. Research will not normally be funded by Section 312 grants. It is anticipated that other sources of Federal, State and

private funds will be available for research in estuarine sanctuaries.

(d) Initial applications should contain the following information:

(1) Description of the proposed sanctuary include location, boundaries, size and cost of acquisition, operation and development. A map should be included, as well as an aerial photograph, if available.

(2) Classification of the proposed sanctuary according to the biogeographic scheme set forth in § 921.4.

(3) Description of the major physical, geographic and biological characteristics and resources of the proposed sanctuary.

(4) Identification of ownership patterns; proportion of land already in the public domain.

(5) Description of intended research uses, potential research organizations or agencies and benefits to the overall coastal zone management program.

(6) Demonstration of necessary authority to acquire or control and manage the sanctuary.

(7) Description of proposed management techniques, including the management agency, principles and proposed budget including both State and Federal shares.

(8) Description of existing and potential uses of and conflicts within the area if it were not declared an estuarine sanctuary; potential use, use restrictions and conflicts if the sanctuary is established.

(i) Assessment of the environmental and socio-economic impacts of declaring the area an estuarine sanctuary, including the economic impact of such a designation on the surrounding community and its tax base.

(9) Description of planned or anticipated land and water use and controls for contiguous lands surrounding the proposed sanctuary (including if appropriate an analysis of the desirability of creating a marine sanctuary in adjacent areas).

(10) List of protected sites, either within the estuarine sanctuaries program or within other Federal, State or private programs, which are located in the same regional or biogeographic classification.

(i) It is essential that the opportunity be provided for public involvement and input in the development of the sanctuary proposal and application. Where the application is controversial or where controversial issues are addressed, the State should provide adequate means to ensure that all interested parties have the opportunity to present their views. This may be in the form of an adequately advertised public hearing.

(ii) During the development of an estuarine sanctuary application, all landowners within the proposed boundaries should be informed in writing of the proposed grant application.

(iii) The application should indicate the manner in which the State solicited the views of all interested parties prior to the actual submission of the application.

(e) In order to develop a truly representative scheme of estuarine sanctuaries, the States should attempt to coordinate their activities. This will help to minimize the possibility of similar estuarine types being proposed for designation in the same region. The application should indicate the extent to which neighboring States were consulted.

(f) Discussion, including cost and feasibility, of alternative methods for acquisition, control and protection of the area to provide similar uses. Use of the Marine Sanctuary authority and funds from the Land and Water Conservation Fund Act should be specifically addressed.

§ 921.12 Application for subsequent development and operation grants.

(a) Although the initial grant application for creation of an estuarine sanctuary should include initial development and operation costs, subsequent applications may be submitted following acquisition and establishment of an estuarine sanctuary for additional development and operation funds. As indicated in § 921.11, these costs may include administrative costs necessary to monitor the sanctuary and to protect the integrity of the ecosystem. Extensive management programs, capital expenses, or research will not normally be funded by section 312 grants.

(b) After the creation of an estuarine sanctuary established under this program, applications for such development and operation grants should include at least the following information:

(1) Identification of the boundary.

(2) Specifications of the management program, including managing agency and techniques.

(3) Detailed budget.

(4) Discussion of recent and projected use of the sanctuary.

(5) Perceived threats to the integrity of the sanctuary.

§ 921.13 Federally owned lands.

(a) Where Federally owned lands are a part of or adjacent to the area proposed for designation as an estuarine sanctuary, or where the control of land and water uses on such lands is necessary to protect the natural system within the sanctuary, the State should contact the Federal agency maintaining control of the land to request cooperation in providing coordinated management policies. Such lands and State request, and the Federal agency response, should be identified and conveyed to the Office of Coastal Zone Management.

(b) Where such proposed use or control of Federally owned lands would not conflict with the Federal use of their lands, such cooperation and coordination is encouraged to the maximum extent feasible.

(c) Section 312 grants may not be awarded to Federal agencies for creation of estuarine sanctuaries in Federally owned lands; however, a similar status may be provided on a voluntary basis for Federally owned lands under the provisions of the Federal Committee on Ecological Preserves program.

Subpart C—Selection Criteria

§ 921.20 Criteria for selection.

Applications for grants to establish estuarine sanctuaries will be reviewed and judged on criteria including:

(a) Benefit to the coastal zone management program. Applications should demonstrate the benefit of the proposal to the development or operations of the overall coastal zone management program, including how well the proposal fits into the national program of representative estuarine types; the national or regional benefits; and the usefulness in research.

(b) The ecological characteristics of the ecosystem, including its biological productivity, diversity and representativeness. Extent of alteration of the natural system, its ability to remain a viable and healthy system in view of the present and possible development of external stresses.

(c) Size and choice of boundaries. To the extent feasible, estuarine sanctuaries should approximate a natural ecological unit. The minimal acceptable size will vary greatly and will depend on the nature of the ecosystem.

(d) Cost. Although the Act limits the Federal share of the cost for each sanctuary to $2,000,000, it is anticipated that in practice the average grant will be substantially less than this.

(e) Enhancement of non-competitive uses.

(f) Proximity and access to existing research facilities.

(g) Availability of suitable alternative sites already protected which might be capable of providing the same use or benefit. Unnecessary duplication of existing activities under other programs should be avoided. However, estuarine sanctuaries might be established adjacent to existing preserved lands where mutual enhancement or benefit of each might occur.

(h) Conflict with existing or potential competing uses.

(i) Compatibility with existing or proposed land and water use in contiguous areas.

If the initial review demonstrates the feasibility of the application, an environmental impact statement will be prepared by the Office of Coastal Zone Management in accordance with the National Environmental Policy Act of 1969 and implementing CEQ guidelines.

§ 921.21 Public participation.

Public participation will be an essential factor in the selection of estuarine sanctuaries. In addition to the participation during the application development process (§ 921.11(e)), public participation will be ensured at the Federal level by the NEPA process and by public hearings where desirable subsequent to NEPA. Such public hearings shall be held by the Office of Coastal Zone Management in the area to be affected by the proposed sanctuary no sooner than 30 days after it issues a draft environmental impact

statement on the sanctuary proposal. It will be the responsibility of the Office of Coastal Zone Management, with the assistance of the applicant State, to issue adequate public notice of its intention to hold a public hearing. Such public notice shall be distributed widely, especially in the area of the proposed sanctuary; affected property owners and those agencies, organizations or individuals with an identified interest in the area or estuarine sanctuary program shall be notified of the public hearing. The public notice shall contain the name, address and phone number of the appropriate Federal and State officials to contact for additional information about the proposal.

Subpart D—Operation

§ 921.30 General.

Management of estuarine sanctuaries shall be the responsibility of the applicant State or its agent. However, the research uses and management program must be in conformance with these guidelines and regulations, and others implemented by the provisions of individual grants. It is suggested that prior to the grant award, representatives of the proposed sanctuary management team and the Office of Coastal Zone Management meet to discuss management policy and standards. It is anticipated that the grant provisions will vary with individual circumstances and will be mutually agreed to by the applicant and the granting agency. As a minimum, the grant document for each sanctuary shall:

(a) Define the intended research purposes of the estuarine sanctuary.

(b) Define permitted, compatible, restricted and prohibited uses of the sanctuary.

(c) Include a provision for monitoring the uses of the sanctuary, to ensure compliance with the intended uses.

(d) Ensure ready access to land use of the sanctuary by scientists, students and the general public as desirable and permissible for coordinated research and education uses, as well as for other compatible purposes.

(e) Ensure public availability and reasonable distribution of research results for timely use in the development of coastal zone management programs.

(f) Provide a basis for annual review of the status of the sanctuary, its value to the coastal zone program.

(g) Specify how the integrity of the system which the sanctuary represents will be maintained.

(h) Provide adequate authority and intent to enforce management policy and use restrictions.

§ 921.31 Changes in the sanctuary boundary, management policy or research program.

(a) The approved sanctuary boundaries; management policy, including permissible and prohibited uses; and research program may only be changed after public notice and the opportunity of public review and participation such as outlined in § 921.21.

(b) Individuals or organizations which are concerned about possible improper use or restriction of use of estuarine sanctuaries may petition the State management agency and the Office of Coastal Zone Management directly for review of the management program.

§ 921.32 Program review.

It is anticipated that reports will be required from the applicant State on a regular basis, no more frequently than annually, on the status of each estuarine sanctuary. The estuarine sanctuary program will be regularly reviewed to ensure that the objectives of the program are being met and that the program itself is scientifically sound. The key to the success of the estuarine sanctuaries program is to assure that the results of the studies and research conducted in these sanctuaries are available in a timely fashion so that the States can develop and administer land and water use programs for the coastal zone. Accordingly, all information and reports, including annual reports, relating to estuarine sanctuaries shall be part of the public record and available at all times for inspection by the public.

[FR Doc.74-12775 Filed 5-31-74;9:57 am]

federal register

FRIDAY, SEPTEMBER 9, 1977

PART IV

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

■

ESTUARINE SANCTUARY

Guidelines

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[15 CFR Part 921]

ESTUARINE SANCTUARY GUIDELINES

Policies and Procedures for Selection

Acquisition and Management

AGENCY: National Oceanic and Atmospheric Administration, Department of Commerce.

ACTION: Proposed rule.

SUMMARY: This proposed rule will allow the National Oceanic and Atmospheric Administration to make a preliminary acquisition grant to a State to undertake a fair market value appraisal, and to develop a uniform relocation act plan, a detailed management plan and a research framework for a proposed estuarine sanctuary, developed pursuant to Section 315 of the Coastal Zone Management Act of 1972, as amended.

DATE: Comments must be received on or before October 1, 1977.

FOR FURTHER INFORMATION CONTACT:

Robert R. Kifer, Physical Scientist, Policy and Programs Development Office, Office of Coastal Zone Management, 3300 Whitehaven Parkway, Page One Building, Washington, D.C. 20235 (202–634–4241).

SUPPLEMENTARY INFORMATION: On June 4, 1974, The National Oceanic and Atmospheric Administration (NOAA) published 15 CFR Part 921 entitled, "Estuarine Sanctuary Guidelines" pursuant to then section 312 of the Coastal Zone Management Act of 1972, as amended, for the purpose of establishing policy and procedures for the selection, acquisition, and management of estuarine sanctuaries.

Under new subsection 315(1) of the Act, the Secretary of Commerce is authorized to make available to coastal States grants of up to 50 per centum of the cost of acquisition, development, and operation of estuarine sanctuaries. In general, subsection 315(1) provides that grants may be awarded to States on a matching basis to acquire, develop, and operate natural areas as estuarine sanctuaries in order that scientists and students may be provided the opportunity to examine over a period of time ecological relationships within the area. The purpose of these guidelines is to implement this program.

As a result of two years of program implementation, the regulations are proposed to be modified to specifically authorize the granting of acquisition money to States in two stages:

(i) An initial grant for such preliminary purposes, as surveying and assessing the land to be acquired, and the development of management procedures and research programs; and

(ii) A second grant for the actual acquisition of the land. The Federal share of the sum of the two grants shall not exceed 50 percent of the acquisition costs involved. Any State receiving an initial grant shall be obligated to repay it if, due to any fault of the State, the sanctuary is not established.

As a result of this new grant procedure, much more information relating to costs, values, management procedures, and research programs will be available at the time of the publication of a draft environmental impact statement. Proposals made public to date in the form of an Environmental Impact Statement (EIS) have been criticized for lack of specificity in these areas. By making a small preliminary acquisition grant to a State, the estuarine sanctuary proposal can be more fully developed and the public can become more aware of the costs and the exact nature of the long-term management.

In response to State questions about estuarine sanctuary research, the proposed regulations provide that such research can be funded if it can be shown to be related to program administration.

NOAA has reviewed these proposed regulations pursuant to the National Environmental Policy Act of 1969 and has determined that promulgation of these regulations will have no significant impact on the environment.

Compliance with Executive Order 11821. The economic and inflationary impact of these proposed regulations has been evaluated in accordance with OMB Circular A–107 and it has been determined that no major inflationary impact will result.

Dated: August 26, 1977.

T. P. GLEITER,
Assistant Administrator for Administration.

It is proposed to amend 15 CFR Part 921 as follows:

(1) By revising the table of contents and authority citation to read as follows:

Subpart A—General

Sec.
921.1 Policy and objectives.
921.2 Definitions.
921.3 Objectives and implementation of the program.
921.4 Biogeographic classification.
921.5 Multiple use.
921.6 Relationship to other provisions of the Act and to marine sanctuaries.

Subpart B—Application for Grants

921.10 General.
921.11 Application for preliminary acquisition grants.
921.12 Application for land acquisition grants.
921.13 Application for operational grants.
921.14 Federally-owned lands.

Subpart C—Selection Criteria

921.20 Criteria for selection.
921.21 Public participation.

Subpart D—Operation

921.30 General.
921.31 Changes in the sanctuary boundary, management policy, or research program.
921.32 Program review.

AUTHORITY: Sec. 315(1), Coastal Zone Management Act of 1972, as amended (90 Stat. 1030, (16 U.S.C. 1461) Pub. L. 94–370).

(2) By revising Subpart B—Application for Grants—as follows:

Subpart B—Application for Grants

§ 921.10 General.

Section 315 authorizes Federal grants to coastal States so that the States may establish sanctuaries according to regulations promulgated by the Secretary. Coastal States may file applications for grants with the Associate Administrator for Coastal Zone Management (OCZM), Office of Coastal Zone Management, Page 1, 3300 Whitehaven Parkway NW, Washington, D.C. 20235. That agency which has been certified to the Office of Coastal Zone Management as the entity responsible for administration of the State coastal zone management program may either submit an application directly, or must endorse and approve applications submitted by other agencies within the State.

§ 921.11 Application for preliminary acquisition grants.

(a) A grant may be awarded on a matching basis to cover costs necessary to preliminary actual acquisition of land. As match to the Federal grant, a State may use money, the cost of necessary services, the value of foregone revenue, and/or the value of land either already in its possession or acquired by the State specifically for use in the sanctuary. If the land to be used as match already is in the State's possession and is in a protected status, the State may use such land as match only to the extent of any revenue from the land foregone by the State in order to include it in the sanctuary. Application for a preliminary acquisition grant shall be made on form SF 424 application for Federal assistance (non-construction programs).

(b) A preliminary acquisition grant may be made for the defrayal of the cost of:

(1) An appraisal of the land, or of the value of any foregone use of the land, to be used in the sanctuary;

(2) The development of a Uniform Relocation Assistance and Real Property Acquisition Policies Act plan;

(3) The development of a sanctuary management plan;

(4) The development of a research and educational program; and/or,

(5) Such other activity of a preliminary nature as may be approved in writing by OCZM. Any grant made pursuant to this subsection shall be refunded by the State to whatever extent it has spent in relation to land not acquired for the sanctuary, and if OCZM requests such refund.

(c) The application should contain:

(1) Evidence that the State has conducted a scientific evaluation of its estuaries and selected one of those most representative.

(2) Description of the proposed sanctuary including location, proposed boundaries, and size. A map(s) should be included, as well as an aerial photograph if available.

(3) Classification of the proposed sanctuary according to the biogeographic scheme set forth in § 921.4.

(4) Description of the major physical, geographic, biological characteristics and resources of the proposed sanctuary.

(5) Demonstration of the necessary authority to acquire or control and manage the sanctuary.

(6) Description of existing and potential uses of, and conflicts within, the area if it were not declared an estuarine sanctuary; and potential use restriction and conflicts if the sanctuary is established.

(7) List of protected sites, either within the estuarine sanctuaries program or within other Federal, State, or private programs, which are located in the same region or biogeographic classification.

(8) The manner in which the State solicited the views of interested parties.

(9) In addition to the standard A-95 review procedures, the grant application should be sent to the State Historic Preservation Office for comment to insure compliance with section 106 of the National Preservation Act of 1966.

(d) In order to develop a truly representative scheme of estuarine sanctuaries, the States should coordinate their activities. This will help to minimize the possibility of similar estuarine types being proposed in the same region. The extent to which neighboring States were consulted should be indicated.

§ 921.12 Application for land acquisition grants.

(a) Acquisition grants will be made to acquire land and facilities for estuarine sanctuaries that have been thoroughly described in a preliminary acquisition grant application, or where equivalent information is available. Application for an acquisition grant shall be made on SF 424 application for Federal assistance (construction program).

In general, lands acquired pursuant to this subsection are legitimate costs and their fair market value, developed according to Federal appraisal standards, may be included as match. The value of lands donated to the State and cash donations may also be used as match. If the State already owns land which is to be used in the sanctuary, the value of any use of the land foregone by the State in order to include such land in the sanctuary, capitalized over the next 20 years, may be used by the State as match. The value of lands purchased by a State within the boundaries of proposed sanctuaries while an application for a preliminary acquisition grant or land acquisition grant is being considered may also be used as match.

(b) An acquisition application should contain the following information:

(1) Description of any changes in proposed sanctuary from that presented in the preliminary acquisition grant application. If such an application has not been made, then, information equivalent to that required in such a grant application should be provided.

(2) Identification of ownership patterns, proportions of land already in the public domain; fair market value appraisal and Uniform Relocation Act plan.

(3) Description of research programs, potential and committed research organizations or agencies, and benefits to the overall coastal zone management program.

(4) Description of proposed management techniques, including the management agency and proposed budget—including both State and Federal shares.

(5) Description of planned or anticipated land and water use and controls for contiguous lands surrounding the proposed sanctuary (including, if appropriate, an analysis of the desirability of creating a marine sanctuary in adjacent areas).

(6) Assessment of the environmental, and socio-economic impacts of declaring the area an estuarine sanctuary, including the economic impact on the surrounding community and its tax base.

(7) Discussion, including cost and feasibility of alternative methods for acquisition and protection of the area.

§ 921.13 Application for operation grants.

(a) Although an acquisition grant application for creation of an estuarine sanctuary should include initial operation costs, subsequent applications may be submitted following acquisition and establishment of an estuarine sanctuary for additional operational funds. As indicated in § 921.11, these costs may include administrative costs necessary to monitor the sanctuary and to protect the integrity of the ecosystem. Extensive management programs, capital expenses, or research will not normally be funded by section 315 grants.

(b) After the creation of an estuarine sanctuary established under this program, applications (Form SF 424) for Federal assistance (non-construction program), for such operational grants should include at least the following information:

(1) Identification of the boundary (map).

(2) Specifications of the research and management programs, including managing agency and techniques.

(3) Detailed budget.

(4) Discussion of recent and projected use of the sanctuary.

(5) Perceived threats to the integrity of the sanctuary.

§ 921.14 Federally-owned lands.

(a) Where Federally-owned lands are a part of or adjacent to the area proposed for designation as an estuarine sanctuary, or where the control of land and water uses on such lands is necessary to protect the natural system within the sanctuary, the State should contact the Federal agency maintaining control of the land to request cooperation in providing coordinated management policies. Such lands and State request, and the Federal agency response, should be identified and conveyed to the Office of Coastal Zone Management.

(b) Where such proposed use or control of Federally-owned lands would not conflict with the Federal use of their lands, such cooperation and coordination is encouraged to the maximum extent feasible.

(c) Section 315 grants may not be awarded to Federally-owned lands; however, a similar status may be provided on a voluntary basis for Federally-owned lands under the provisions of the Federal Committee on Ecological Perserves program.

§ 921.20 [Amended]

(4) Subpart C—Selection Criteria—is amended by changing the first sentence in § 921.20 to read: "Applications for preliminary acquisition or land acquisition grants to establish estuarine sanctuaries will be reviewed and judged on criteria including:"

(5) Section 921.21 is revised, as follows:

§ 921.21 Public participation.

(a) Public participation in the selection of an estuarine sanctuary is required. In the selection process, the selecting entity (see § 921.10) shall seek the views of possibly affected landowners, local governments, and Federal agencies, and shall seek the views of possibly interested other parties and organizations. The latter would include, but need not be limited to, private citizens and business, social, and environmental organizations in the area of the site being considered for selection. This solicitation of views may be accomplished by whatever means the selecting entity deems appropriate, but shall include at least one public hearing in the area. Notice of such hearing shall include information as to the time, place, and subject matter, and shall be published in the principal area media. The hearing shall be held no sooner than 15 days following the publication of notice.

(b) The Office of Coastal Zone Management (OCZM) shall prepare draft and final environmental impact statements pertaining to the site finally selected for the estuarine sanctuary following public participation in the selection of that site, and shall distribute these as appropriate. OCZM may hold a public hearing in the area of such site at which both the draft environmental impact statement (DEIS) and the merits of the site selection may be addressed by those in attendance. OCZM shall hold such a hearing if: (1) In its view, the DEIS is controversial, or (2) if there appears to be a need for further informing the public with regard to either the DEIS or one or more aspects of the site selected, or (3) if such a hearing is requested in writing (to either the selecting entity or (CZM) by an affected or interested party, or (4) for other good cause. If held, such hearing shall be held no sooner than 30 days following the issuance of the DEIS and no sooner than 15 days after appropriate notice of such hearing has been given in the area by OCZM with the assistance of the selecting entity.

[FR Doc.77-26128 Filed 9-8-77;8:45 am]

federal register

Wednesday
June 27, 1984

Part IV

Department of Commerce

National Oceanic and Atmospheric Administration

15 CFR Part 921

National Estuarine Sanctuary Program Regulations; Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 921

[Docket No. 40315-30]

National Estuarine Sanctuary Program Regulations

AGENCY: Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: These final regulations revise existing procedures for selecting and designating national estuarine sanctuaries and provide guidance for their long-term management. Site identification and selection is to be based on a revised biogeographic classification scheme and typology of estuarine areas. The regulations place a greater emphasis on management planning by individual states early in the process of evaluating a potential site. The regulations reflect a progression from the initial identification of a site, through the designation process, and continued management of the sanctuary by the state after Federal financial assistance has ended. The regulations provide for regular programmatic evaluations of sanctuary performance. Clarifications in the financial assistance application and award process have also been made.

EFFECTIVE DATE: These regulations are effective Friday, October 5, 1984. This delayed effective date will allow sufficient time for the Congress to enact legislation pertaining to the conduct of the National Estuarine Sanctuary Program if it chooses to do so. If necessary, the effective date of these regulations will be postponed, and a notice thereof published in the Federal Register, in compliance with the notice provisions contained in section 12 of the Coastal Zone Management Act, 16 U.S.C. 1463a.

FOR FURTHER INFORMATION CONTACT: Dr. Nancy Foster, Chief, Sanctuary Programs Division, Office of Ocean and Coastal Resource Management, NOAA/NOS, 3300 Whitehaven St., NW., Washington, D.C. 20235, (202) 634-4236.

SUPPLEMENTARY INFORMATION:

I. Authority

This notice of final rulemaking is issued under the authority of Section 315(1) of the Coastal Zone Management Act, 16 U.S.C. 1461(1). The National Estuarine Sanctuary Program has been operating under guidelines published June 4, 1974 (39 FR 19922) and proposed regulations published September 9, 1977 (42 FR 45522).

II. General Background

On August 3, 1983 (48 FR 35120), NOAA published proposed regulations for continued inplementation of the National Esturine Sanctuary Program pursuant to Section 315 of the Coastal Zone Management Act, 16 U.S.C. 1461, (the Act). Written comments on the proposed regulations were accepted until October 3, 1983. These comments have been considered in preparing these final regulations. A summary of significant comments on the proposed regulations and NOAA's responses are presented below.

The final regulations establish the Program's Mission and Goals and revise the procedures for selecting, designating, and operating national estuarine sanctuaries.

III. Refinements to the Regulations for the National Estuarine Sanctuary Program

Based on experience in operating the Program and comments on the proposed regulations, a number of refinements in operational procedure and policy have been designed. The final regulations implement these refinements, which include:

A. Defining the Mission and Goals of the Program

The Mission Statement and Goals for the continued implementation of the National Estuarine Sanctuary Program stress the importance of designating estuarine area, through Federal-state cooperative efforts, for long-term research and educational benefits. Though broad in scope, they establish a framework within which specific Program activities are conducted. The Mission Statement and Goals are adopted by the final regulations (§ 921.1).

B. Revision of the Procedures for Selecting, Designating and Operating Estuarine Sanctuaries

(1) Revision of the Biogeographic Classification Scheme and Proposed Estuarine Typologies

The 1974 guidelines identified 11 biogeographic regions from which representative sites throughout the coastal waters of the United States would be chosen. Section 921.4(b) of the 1974 guidelines provided that "various sub-categories will be developed and utilized as appropriate."

In 1981, a study was undertaken to assess the original biogeographic classification scheme and make recommendations, as necessary. A system with 27 subcategories was proposed. The subcategories fit within the original scheme and further define the coastal areas to assure adequate sanctuary representation (Clark, *Assessing the National Estuarine Sanctuary Program: Action Summary*, March 1982, cited as *The Clark Report*).

The Clark Report also recommends consideration of an estuarine typology in evaluating and selecting sites. The typology system recognizes that there are significant differences in estuary characteristics not related to regional location. Such factors include water source, water depth, type of circulation, inlet dynamics, basin configuration, watershed type, and dominant ecological community.

The final regulations adopt the revised biogeographic classification scheme and the recommendation to consider typology in site selection (see § 921.3).

(2) Site Designation

Eligible states may apply for preacquisition awards to aid in selecting an estuarine site in conformity with the classification scheme and typology system. A description of the site selection process to be carried out by the state, including a provision for public participation in the process, must be submitted for NOAA's approval. This ensures that the procedures for the site selection process are planned prior to implementing the selection process and approval of the preacquisition award. Figure 1 depicts the entire designation process.

After selection of a site, a draft management plan is prepared. Requiring the development of a comprehensive draft management plan in the preacquisition phase is designed to guarantee that early in the estuarine sanctuary designation process the state considers management policies, an acquisition and construction plan (including schedules and priorities), staffing requirements, a research component, interpretive and education plans, future funding and other resource requirements, and alternatives. Draft and final environmental impact statements (EIS) are prepared analyzing the environmental and socioeconomic

impacts of establishing a sanctuary and implementing the draft management plan. The EIS is prepared in accordance with National Environmental Policy Act (NEPA) procedures, including provisions for public comment and hearings.

Following NOAA approval of the draft management plan and the final EIS, the site enters an initial acquisition and development phase. The state is then eligible for an initial acquisition and development award. During this phase, award funds may be used to purchase land, construct minor facilities (subject to pre-designation construction policies, see § 921.21), prepare the final management plan, and initiate onsite research and education programs. All of these tasks are to be carried out in conformance with the NOAA-approved draft management plan.

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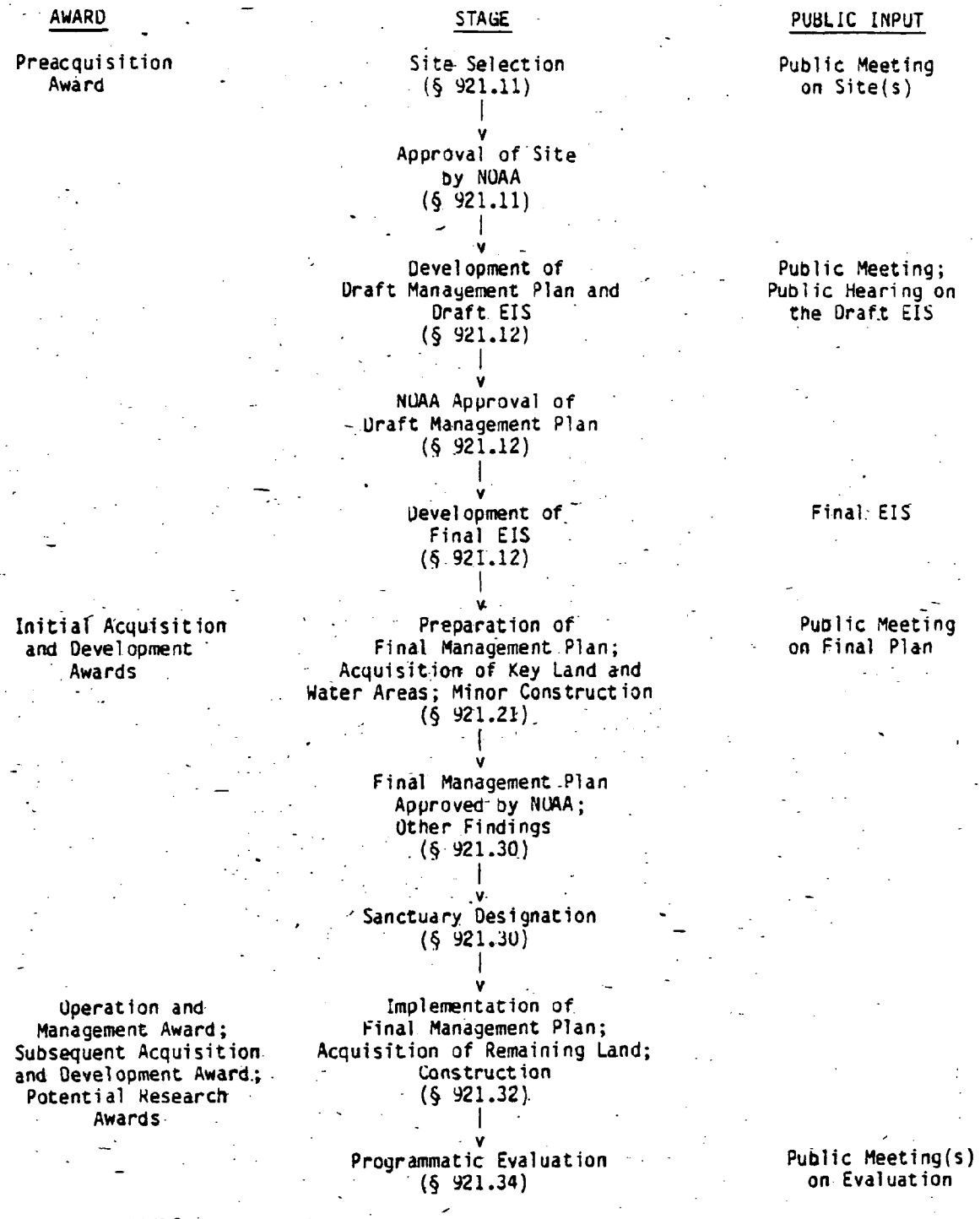
Figure 1. National Estuarine Sanctuary Program Designation Process



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The task under the intial acquisition and development phase should be completed within two years. At this point, NOAA must make formal findings, as specified § 921.30, that the final management plan has been completed and is approved, that the key land and water areas as specified in the management plan are under state control, and that a memorandum of understanding between the state and NOAA concerning the state's long-term commitment to the sanctuary has been signed. After NOAA makes these findings, the sanctuary is considered "designated". The state than begins implementation of the final management plan, including the construction of necessary facilities and additional land acquisition. The state is also eligible for operation and management awards to provide assistance in implementing the final management plan.

The regulations also provide procedures for the programmatic evaluation of a sanctuary during the period of the operation and management awards (or under the initial acquisition and development award if the sanctuary is not designated within two years) and for a continuing, biennial review of an estuarine sanctuary after Federal funding has expired. Procedures for withdrawing designation, if a sanctuary fails to meet established standards, have been added (§ 921.35).

To foster scientific studies within national estuarine sanctuaries, NOAA is setting aside funds for research within sites with approved final management plans. This is a separate category of financial assistance from the operation and management or acquisition and development support. The research funding is described in Subpart E.

Financial assistance requirements and procedures have been revised. The programmatic information required for each type of award is specified in the appropriate sections—in preacquisition (Subpart B); acquisition and development (Subpart C); and operation and management (§ 921.32). General financial assistance information is provided in Subpart F.

In summary, the regulations include more standards and guidelines for states to follow in developing and operating a national estuarine saanctuary, as well as additional guidelines for NOAA in overseeing the Program. Based on experience and from discussions with several states with estuarine sanctuaries, NOAA has found that the previous lack of guidance raised many concerns about what an estuarine sanctuary should be, the state's role in developing and operating a sanctuary, and how decisions should be made. The regulations ensure that a state will have adequate flexibility in long-term operation of an estuarine sanctuary to deal with changing circumstances. The regulations require more information about the sanctuary, particularly through the development of a site-specific management plan, prior to each step in the funding process. In this manner, it is expected that decisions affecting the sanctuary and management priorities will be planned for in advance, rather than in an *ad hoc* fashion.

IV. Summary of Significant Comments on the Proposed Regulations and NOAA's Responses

Comments were received from 17 sources. Commenters included Federal and state agencies, representatives of the oil and gas industry, representatives of the electric utility industry, and environmental and public interest groups. All comments received are on file at the Sanctuary Programs Division, Office of Ocean and Coastal Resource Management, 2001 Wisconsin Avenue, NW., Room 334 Washington, D.C. 20235. The comments are available for review at that office. Each of the major issues raised by the commenters has been summarized and NOAA's response provided under the relevant subheading in this section.

General

Impact on Existing Sanctuaries

One commenter suggested that the final regulations indicate the impact of the changes on existing sanctuaries.

Response: The changes in procedure reflected in these regulations will improve the Program's operation and the effective implementation of national estuarine sanctuaries over time. They will therefore be applied to existing sanctuaries to the degree practicable.

Public Participation

Because of the potential impacts resulting from an area being designated as a national estuarine sanctuary, one commenter noted that the maximum opportunity for the participation of interested persons should be provided. The commenter encouraged NOAA to ensure that states comply with the conditions of §§ 921.11(d) and 921.12(d). The commenter recommended that a careful review of all established and potential industrial activities be undertaken to ensure a well-balanced decision on the site's suitability for designation as a national estuarine sanctuary.

Response: NOAA agrees with the comment on the importance of public participation. Public participation efforts by the states, in conjunction with NOAA, are mandated by these regulations as an integral part of site selection, designation, and management.

The Program's purpose is to establish selected estuarine areas as sanctuaries to serve as natural field laboratories and provide opportunities for long-term research, education, and interpretation. Because of this, the present and future uses of such an area are certainly an important factor in considering whether it should be a national estuarine sanctuary.

It is also important to emphasize that the Program does not involve broad scale regulation on land uses apart from that already undertaken by the state or proposed by the state under its own applicable authorities. Multiple use of national estuarine sanctuaries is encouraged (see § 921.1(d)). Resource protection is, however, the highest priority goal of the National Estuarine Sanctuary Program and uses must be compatible with long-term resource protection. Within national estuarine sanctuaries, states may impose certain regulatory controls to ensure the continued protection of sanctuary resources. Areas proposed for designation are evaluated through the EIS process with opportunities for public comment.

Section-by-Section Analysis

Subpart A—General

Section 921.1—Mission and Goals.

(1) Several commenters supported the Program Mission and Goals and found them to be a substantial improvement over the 1974 guidelines and 1977 proposed regulations.

Response: The Mission and Goals were established to guide continued effective implementation of the National Estuarine Sanctuary Program. Program experience over the past several years led to the development of refinements designed to improve the original guidelines.

The concept of a national estuarine sanctuary does not easily merge with that of existing natural resource protection programs, such as wildlife refuges or parks. National estuarine sanctuaries are designed to ensure protection of a natural habitat unit in which long-term research and educational projects can be focused. A primary aim of these research and education projects is to provide information to states that is useful for decisionmaking concerning the development or protection of its coast and associated resources.

National estuarine sanctuaries are not established primarily for recreational pursuits, although compatible uses are encouraged. Sanctuaries are also not intended solely to enhance habitat for a single species by modification of the natural character of the estuarine system.

The final regulations, including the Mission and Goals, are designed to clarify the definition and function of a national estuarine sanctuary.

(2) Another commenter, however, suggested that the section on Mission and Goals, which replaced the "Policy and Objectives" section of the 1974 guidelines, expands the scope of the Program in ways not originally intended. The commenter suggested that Goal 2 (concerning research) was adequate, and that the other three should be deleted. The commenter suggested that the first goal, concerning long-term management planning, should be left to the National Marine Sanctuary Program or state coastal zone programs. The commenter further suggested that the third goal, involving enhancement of public awareness through interpretation, should also be dropped even though it was recognized that such interpretive efforts often stem from scientific research. Finally, the commenter suggested that the fourth goal, involving stimulating Federal-state cooperation to promote the management of estuarine areas, should be dropped since it allegedly provides the Federal government with more authority than needed. The commenter supports this view by citing legislative history to assert that the Act "authorizes Federal grants-in-aid, but makes no attempt to diminish State authority through Federal preemption."

The same commenter generally questions the need for the National Estuarine Sanctuary Program and need for revisions to the existing program. The commenter encouraged NOAA to examine the legal and scientific bases for the estuarine sanctuary program and to ensure that the regulations conform to the intended goals of the Coastal Zone Management Act.

Response: The Mission and Goals described in Section 921.1 are in no way an expansion of the Program. Rather they reflect the legislative history and a synthesis of the Program's past experience and need for basic policy guidance. Goals 2 and 3 are both valid; since both education and interpretive efforts are natural outgrowths of science. The first goal, involving management planning, represents a logical mechanism for achieving Program purposes with maximum utility and a minimum amount of waste. NOAA disagrees with the commenter on Goal 4. The purpose of the goal is to ensure the protection of selected estuarine areas. Federal/state cooperative efforts to ensure such protection are emphasized; the Federal role encompasses more then grants-in-aid, but includes continuing evaluation and coordination of research and education to ensure that the sites remain as natural field laboratories consistent with the legislative intent.

NOAA has based these revised regulations on the Act and its legislative history. Through experience with the Program, NOAA has made certain refinements to the process: In fact, by explicitly providing for Section 312 evaluations (as required by the Coastal Zone Management Act) as seeking to coordinate research and education from the national level, the Program has made significant strides to fulfill the Congressional intent (see §§ 921.1(c) and 921.34).

(3) One reviewer felt that the idea of coordinating research and education information expressed in § 921.1(c) was a good idea, but should be carefully thought out and developed in coordination with individual states.

Response: NOAA is now in the process of developing a detailed plan for coordinating research and education. Comments from states and other interested groups are being actively solicited in preparing this plan.

(4) Several commenters strongly supported the concept in § 921.1(d) of encouraging multiple use of estuarine sanctuaries. One of the same commenters also supported the statement in Section 921.11(c)(5) that the site selection process consider "the site's compatibility with existing and potential land and water use in contiguous areas."

Response: NOAA is strongly committed to the concept of multiple use in estuarine sanctuaries as long as the purposes for which the sanctuary is established are maintained. Therefore it is important that site selection efforts closely analyze existing and potential uses of the area and adjacent areas.

Section 921.3—Biogeographic Classification Scheme. (1) One state requested that the goal of one site per region be revised to allow for more sites per region based on the estuarine typology system. The commenter noted that only by including several sites per region could all significant national variation be included. The commenter suggested that outright acquisition was not always necessary. The alternative suggested was to incorporate into the National Estuarine Sanctuary Program those sites, as appropriate, that are owned by a state or conservation group. In this way actual ownership would not be as important as the site's value to the Program.

Response: NOAA believes that the inclusion of representatives of all national estuarine variations would be impracticable from a management perspective. It should be noted that control of estuarine land and water areas is only one facet in sanctuary designation. Properties already owned by the state or a conservation group may not comprise a natural unit or have the research and educational foundation required by the Program. Such areas are already in a protected status and are available for research and educational purposes, along with those regional representatives comprising the National Estuarine Sanctuary system. Adding these sites to the Program may not serve beneficial purposes. Thus, while the biogeographic classification scheme sets the initial parameters within which detailed site selecion and analysis is focused, it should not be considered alone. Many other factors must be considered.

Within regions without an estuarine sanctuary, however, the non-acquisition alternatives suggested by the commenter will be utilized to the greatest degree possible.

(3) Another commenter was concerned that implementation of the biogeographic classification scheme on the basis of one site per region would lead to too many estuarine sanctuaries.

Response: As detailed in *The Clark Report*, the classification scheme and estuarine typology are designed to provide the Program with an array of sanctuaries broadly reflective of our Nation's estuarine zones. Only with this diversity of sites can the Program produce beneficial research and educational projects useful in coastal decisionmaking. There are presently 14 biogeographic regions represented in the system.

(4) Another commenter stated that by including 27 regions, and providing for one site per region, NOAA has extened the Program in an unwarranted manner. The commenter recommended instead that NOAA use the classification scheme in the Program Development Plan for the National Marine Sanctuary Program which relied on eight regions.

Response: Estuarine sanctuaries, in order to be beneficial for long-term research and educational purposes, should reflect the Nation's coastal areas. The biogeographic classification scheme and estuarine typologies were developed from this premise as demonstrated in *The Clark Report*. In

identifying sites for potential marine sanctuary status, eight regions were used, but for administrative purposes rather than representativeness. On top of this scheme, a detailed marine classification scheme, developed solely for marine areas and illustrative of the Nation's oceans, was applied. As a result of this process, twenty-nine sites were selected by NOAA for placement on the Site Evaluation List (see 48 FR 35568 (1983)).

Section 921.4(b)—Coordination With the National Marine Sanctuary Program. One commenter was concerned about the possible duplication of time and effort if an area is established as an estuarine sanctuary and a marine sanctuary. The commenter requested that NOAA address the possibility of a dual designation and means by which both programs could coexist without generating serious problems.

Response: Section 921.4(b) is intended only to ensure that the National Estuarine Sanctuary Program and National Marine Sanctuary Program work closely together; this is particularly true in terms of management planning, research projects, and education/interpretive activities. It is also important to note that the Programs are not duplicative and could serve complementary purposes. The regulations have been clarified to provide that the boundaries of the national marine and estuarine sanctuaries would not overlap, even though they may be adjacent (similar to the case where a National Wildlife Refuge abuts a National Park).

Subpart B—Preacquisition: Site Selection and Management Plan Development

Section 921.10—General. (1) One state suggested that the $50,000 Federal share was not enough to accomplish the goals of the preacquisition award (e.g., site selection and draft managment plan development) and recommended that a small sum be set aside for site selection, and that other funds to prepare the draft plan be negotiated between the state and the Federal government based on the proposed sanctuary's complexity.

Response: Based on past experience, the $50,000 Federal funding level, supplemented by state match, is adequate for site selection and draft plan development. Additional funds to complete the final plan are available under the acquisition and development award (see § 921.21).

(2) One commenter suggested that specific reference to the need for Federal agency coordination be included in Subpart B. Such coordination could appropriately occur during the EIS process, but the commenter suggested that states may wish to involve Federal agencies with special expertise earlier during the site selection process.

Response: The regulations require that states seek the views of Federal agencies as well as other parties early in the site selection process (see §§ 921.11(d) and 921.12(a)(3)). Federal agencies will also be actively involved in the management planning process and EIS development (see § 921.12 (d) and (e)).

Section 921.11—Site Selection. (1) Several states suggested that the regulations address multiple-site national estuarine sanctuaries.

Response: Section 921.10(b) has been revised to specifically reference multiple-site systems within the National Estuarine Sanctuary Program.

(2) One commenter urged early and frequent public involvement in the designation and management of national estuarine sanctuaries. It was suggested that where the proposed regulations limit notice to the local media (for example in § 921.11(d) concerning preliminary site selection), notice should also be made in the Federal Register since not all parties interested in the proposed designation live in the adjacent area and the Program has a broad national interest.

Response: This change has been made (see § 921.11(d)).

Section 921.12—Management Plan Development. (1) One state noted that § 921.12(b), concerning management plan development, should include a description of the sanctuary administrative structure as a required plan component. It was suggested that the plan should at least outline the staff's roles for research, education/interpretation, and enforcement.

Response: NOAA agrees and language to this effect has been added at § 921.12(b)(2).

(2) One state suggested that an environmental impact statement not be required in all cases. Rather, in less complex situations, the flexibility to prepare an environmental assessment should be left open.

Response: NOAA disagrees. Based on experience with the program, an environmental assessment is not an adequate mechanism to fully consider the environmental and socioeconomic impacts of a proposed national estuarine sanctuary, particularly where a management program is being proposed. Further, it does not provide for the extensive public review required through the NEPA process. We believe that designation of any site qualifies as a significant Federal action for the purposes of the NEPA EIS requirement.

(3) One commenter noted that since resource protection is a primary program goal, the regulations should specify that the plan detail responsibilities for surveillance and enforcement of human activities.

Response: NOAA agrees and the regulations (at § 921.12(b)(8)) have been revised to require that responsibilities for surveillance and enforcement be detailed in the management plan.

(4) One commenter questioned the usefulness of the NOAA-state memorandum of understanding (MOU), which is required as part of the management plan (see § 921.12 (a)(5) and (b)(10)). The commenter suggested that the MOU could not be considered legally binding on future legislatures.

Response: The MOU emphasizes the significance of establishing an estuarine sanctuary and recognition by the state and Federal government of the long-term commitment to management of the area in accordance with the agreed-upon goals and objectives. The MOU spells out, at the beginning of the process, the roles of the Federal and state governments, and what is expected of each party. It will clearly indicate that each party is aware of its commitment and responsibilities at the beginning of the process. The MOU emphasizes that lands acquired under the National Estuarine Sanctuary Program must continue to be used in a manner consistent with sanctuary purposes.

(5) Several states approved requiring the management plan early in the process as a guide to future decisions before the expenditure of substantial funds. Other commenters, however, expressed concern that requiring the preparation of a draft management plan prior to any commitment to the site from NOAA could lead to the waste of extensive staff time, public participation, and resources.

Response: These regulations are predicated upon ten years of experience in administering the National Estuarine Sanctuary Program. The regulations are intended to rectify many of the problems that have occurred in specific sanctuaries in the past. Many of these problems could have been foreseen and overcome by thoughtful, pre-sanctuary planning. Thus, NOAA is strongly supportive of developing a management plan early in the decision process. The concern that NOAA is not committed to the state during the draft management plan process is unwarranted given the procedures specified in the regulations. NOAA's financial commitment begins with the preacquisition award for site

selection and continues through all the developmental stages. NOAA may support up to one-half of the total costs of establishing a particular sanctuary. NOAA's programmatic commitment to a proposed sanctuary begins with approval of a site and continues through the management plan review and preparation of the EIS. If the sanctuary proposal is approved, and if the requirements of the preacquisition phase are met, NOAA will proceed with establishing the site as a national estuarine sanctuary.

Decision points early in the process provide opportunities for either party to withdraw before too much time and effort have been committed.

(6) In terms of § 921.12(b)(7), one commenter suggested that the schedule for acquisition, required as part of the management plan, was useful as a guide, but not as a rigid planning document.

Response: NOAA views the acquisition strategy as a flexible planning tool. It does, however, identify key areas where acquisition should be focused and acquisition priorities developed. The strategy will also contain alternatives (including boundary changes) if selected priority areas eventually cannot be acquired.

(7) One commenter suggested that the requirements for the draft management plan should reference three additional elements, all of which were included in the 1974 guidelines: (1) Definitions of permitted, compatible, restricted and prohibited uses; (2) a monitoring plan to ensure that the integrity of the sanctuary is maintained; and (3) a description of the authorities which will be put in place to manage the Sanctuary and enforce the policy and use restrictions.

Response: A resource protection plan requirement has been added (see § 921.12(b)(8)) which encompasses elements (1) and (3). A monitoring plan should be included as part of the research plan (see § 921.12(b)(3)).

Subpart C—Development and Preparation of the Final Management Plan

Section 921.21—Initial Acquisition and Development Awards. (1) One state noted that the limit of 5 percent of the initial acquisition and development awards which may be expended on minor construction activities which aid in implementing portions of the management plan may not be adequate for multiple-site systems.

Response: After careful consideration, NOAA has determined that necessary construction can be planned for and included as part of the initial award. The intent of this restriction is to limit large capital expenditures until a final plan is prepared and substantial progress in land acquisition has been made.

Section 921.32—Operation and Management: Implementation of the Management Plan. (1) One state suggested the $250,000 cap on federal funding for operation and management in Section 921.32(b) should be modified to provide for additional funds based on need.

Response: The Program is designed to assist states in establishing estuarine sanctuaries. Funds are provided for an initial period of implemenatation; thereafter the states must assume responsibility for continued operation.

Section 921.33—Boundary Changes and Amendments to the Management Plan. (1) Several states requested that this section be modified to apply only to laws specifically applicable to the sanctuary, and not general environmental quality laws such as for air and water.

Response: Section 921.33 has been clarified to reflect this point.

(2) One commenter recommended that public notice and opportunity to comment be provided in all cases where boundaries are changed or management plans are amended under § 921.33.

Response: The proposed regulations provide that if NOAA determines it is necessary, public notice and an opportunity for comment on boundary changes and changes to the final management plan will be provided. Major changes do require public notice and opportunity for comment and, in certain cases, preparation of an environmental assessment. Thus, the clear intent of these regulations is to provide for public notice where applicable. There may, however, be times where changes to the management plan are minor and will not require such notice.

Section 921.34—Program Evaluation. (1) One commenter specifically questioned the value of Section 312-type evaluations of sanctuary performance; the commenter stated that performance reports, which are required as a condition of the financial award, are adequate for NOAA's purposes.

Response: Performance reports are of course helpful. But such reports do not address the specific range and depth of issues needed to assess the effectiveness of sanctuary operation and opportunities for improvement. In addition during an evaluation, individuals or groups that are, or should be, involved in sanctuary management or are affected by the sanctuary are contacted. This provides NOAA with valuable feedback that is necessary to gauge the effectiveness of the sanctuary's program.

(2) The same commenter as in (1) also questioned the value of a program evaluation after Federal funding expires.

Response: The required evaluations will ensure that sanctuary objectives, as specified in the management plan, are still being attained and that proposed boundary changes and amendments to the management plan can be reviewed. The evaluations will ensure that the purposes for which the sanctuary was established continue to be met and that the site meets the criteria of the national system.

After Federal funding expires, the state is required to submit an annual report on the sanctuary. The report will detail program successes and accomplishments in implementing the policies and activities described in the sanctuary management plan. The report also should propose a work plan for the next year of sanctuary operations and describe the state's role in ongoing sanctuary programs. Inadequate annual reports will trigger a full-scale evaluation with a site-visit. In addition, on a periodic basis, NOAA will also conduct a full-scale Section 312 evaluation with a site visit.

Section 921.35—Withdrawal of Designation. (1) Several reviewers suggested that the section on the withdrawal of designation be modified to allow the applicable state to participate in decisions regarding the disposition of property.

Response: The state will of course be consulted by NOAA in any decision regarding property disposition, which will be carried out according to Attachment N of OMB Circular A-102, Revised, and these regulations.

(2) Several reviewers questioned, in the event of withdrawal of sanctuary designation, the method of disposal for property held in less-than-fee simple or controlled by a lease.

Response: Section 921.21(e) [which was § 921.35(e) in the proposed regulations] would be followed to the extent it applies. Leasehold and other real property interests purchased in whole or in part with Federal funds are subject to the provisions of Attachment N, OMB Circular A-102, Revised.

(3) Another state requested that the deed language be rewritten so that a state would be "entitled to retain title to property which the state determines is no longer needed for grant purposes, so long as the property is used for other purposes approved by NOAA as being consistent with the sanctuary program."

Response: When property purchased in fee simple or less-than-fee simple is

no longer used for the purposes of the National Estuarine Sanctuary Program, NOAA is required to dispose of the property according to the provisions of Attachment N, OMB Circular A-102, Revised. These provisions are essentially the same as stated in § 921.21 (e) of the final regulations.

(4) One commenter suggested that specific criteria and an appeals procedure (including public notice of the proposed withdrawal of designation) be added to the regulations.

Response: As specified in §§ 921.34 and 921.35, NOAA's continuing evaluation of sanctuary performance will examine the state's performance in upholding the mandate of Section 315 of the Act, the national Program goals, and the policies established in the management plan. Specific criteria to judge these factors cannot be enumerated, but will be examined on a case-by-case basis. Section 921.35 spells out a procedure for withdrawal of designation, including an appeal to the Assistant Administrator for Ocean Services and Coastal Zone Management.

(5) One state questioned who would decide the "current fair market value" of lands slated for withdrawal of designation in § 921.35(e)(i) [now § 921.21(e)(i)]. It was recommended that an arbitration system of three independent appraisers or comparable system be established.

Response: Fair market value would be determined by an independent appraiser (e.g., certified real property appraiser or GSA representatives) and certified by a responsible official of the state, as provided by Attachment F of OMB Circular A-102, Revised.

Subpart E—Research Funds

(1) Several reviewers suggested that research funds be offered on a 100 percent Federal basis, i.e., without a state match requirement.

Response: Section 315 of the Coastal Zone Management Act requires that all funds to coastal states for national estuarine sanctuary purposes be provided on a fifty-fifty matching basis.

(2) Other commenters suggested that funding limits and the total research budget be discussed in the regulations.

Response: Funding limits and the total Federal funds for research in national estuarine sanctuaries will vary from year-to-year; thus, these figures are not included in the final regulations. NOAA will, however, distribute information about the relative funding limits and funding totals. Such information will be sent to states with national estuarine sanctuaries and to other interested parties.

Subpart F—General Financial Assistance Provisions

(1) One state criticized the exclusion of land as state match for the operation and management awards. The state found such an exclusion to be an undue constraint upon management and operation alternatives available to states.

Response: In order to maximize the support provided to a sanctuary during its early years, NOAA has precluded land as match for the operation and management award. To a reasonable degree, state match should relate to the purpose of the particular award. Since the purpose of the operation and management award is to provide for the sanctuary's operation and implementation of the management plan, the use of land as match is inappropriate, particularly since land acquisition should be well underway prior to the state's receiving an operation and management award. The allowable categories of match (see § 921.51(e)) provide the state with sufficient flexibility.

Appendix 2—Estuarine Typology

(1) One reviewer stated that in Group III—Chemical, the proposed salinity limits were particularly confusing. The reviewer noted that a salinity zone of 10 ppt to 20 ppt is very important because numerous estuaries possess waters in this salinity range, but the proposed polyhaline zone is too broad to describe this. The reviewer included the following table of salinity ranges from *Introduction to Marine Biology* by Mosby:

Salinity (o/oo)	Type of water
0 to 0.5	Fresh water.
0.5 to 3.0	Oligohaline brackish water.
3.0 to 10	Mesohaline brackish water.
10.0 to 17	Polyhaline brackish water.
17 to 30	Oligohaline seawater.
30 to 34	Mesohaline seawater.
34 to 38	Polyhaline seawater.
>38	Brine.

From Valikangas, I. 1933. Uber die Biologie der Ostsee als Brackwassergebiet. Verh. int., Verein. theor. angew. Limnol. 6:1.

Response: Polyhaline should be 30 ppt to *18* ppt; the "5" was a typographical error. NOAA considered the information provided, but has decided to continue to use the proposed salinity ranges which are from *Ecology of Inland Waters and Estuaries* (Reid and Wood, 1976). This is the standard limnology test used in college. The table used as an example is from a 1933 paper; the salinity table used in the typology is the widely accepted "Venice System" adopted in 1958.

(2) The same reviewer also questioned the pH values suggesting that a pH of 5.5 is somewhat acid. It was suggested that the circumneutral range should be 6.5 rather than 5.5.

Response: For the reasons indicated in the above response, we decided to continue with the proposed system.

(3) Another reviewer stated that in Group II-Transition Areas, the description of coastal marshes and coastal mangroves as the only coastal wetland transition areas is too narrow. Other wetland areas (marshes, swamps, bogs) should be included.

Response: A new subtitle "Coastal Marshes and Swamps" has been added.

(4) Another commenter stated that the typology did not appear to contain criteria which adequately describe a Great Lakes-type site.

Response: Great Lakes areas can fall under Class II, Group I.B (Basin Structure); I.C (Inlet Type); I.D. (Bottom Composition); Group II.A (Circulation); II.C (Freshwater); and Group III-Chemical.

V. Other Actions Associated With the Proposed Rulemaking

(A) Classification Under Executive Order 12291

NOAA has concluded that these regulations are not major because they will *not* result in:

(1) An annual effect on the economy of $100 million or more;

(2) A major increase in costs or prices for consumers, individual industries, Federal, state or local government agencies, or geographic regions; or

(3) Significant adverse effects on competition, employment, investment, productivity, innovation or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These final rules amend existing procedures for selecting and processing potential national estuarine sanctuaries in accordance with a revised biogeographic classification scheme and estuarine typologies. These rules establish a revised process for identifying, designating and managing national estuarine sanctuaries. They will not result in any direct economic or environmental effect nor will they lead to any major indirect economic or environmental impacts.

(B) Regulatory Flexibility Act Analysis

The General Counsel of the Department of Commerce certified to the Small Business Administration that this rule will not have a significant economic impact on a substantial number of small entities. Thus, regulatory Flexibility Analysis is not

required for this notice of final rulemaking. The regulations set forth procedures for identifying and designating national estuarine sanctuaries, and managing sites once designated.

These rules do not directly affect "small government jurisidictions" as defined by Pub. L. 96-354, the Regulatory Flexibility Act, and the rules will have no effect on small businesses.

(C) Paper Work Reduction Act of 1980 (Pub. L. 96-511)

These regulations do not impose any information requirements of the type covered by Pub. L. 96-511 other than those already approved by the Office of Management and Budget (approval number 0648-0121) for use through September 30, 1988.

(D) National Environmental Policy Act

NOAA has concluded that publication of these rules does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an environmental impact statement is not required.

List of Subjects in 15 CFR Part 921

Administrative practice and procedure, Coastal zone, Environmental protection, Natural resources, Wetlands.

(Federal Domestic Assistance Catalog Number 11.420 Estuarine Sanctuary Program)

Dated: February 29, 1984.

Paul M. Wolff,

Assistant Administrator for Ocean Services and Coastal Zone Management.

Accordingly, 15 CFR Part 921 is revised as follows:

PART 921—NATIONAL ESTUARINE SANCTUARY PROGRAM REGULATIONS

Subpart A—General

Sec.
921.1 Mission and goals.
921.2 Definitions.
921.3 National Estuarine Sanctuary Biogeographic Classification Scheme and Estuarine Typologies.
921.4 Relationship to other provisions of the Coastal Zone Management Act and to the National Marine Sanctuary Program.

Subpart B—Preacquisition: Site Selection and Management Plan Development

921.10 General.
921.11 Site selection.
921.12 Management Plan development.

Subpart C—Acquisition, Development, and Preparation of the Final Management Plan

921.20 General.
921.21 Initial acquisition and development awards.

Subpart D—Sancturay Designation and Subsequent Operation

Sec.
921.30 Designation of National Estuarine Sanctuaries.
921.31 Supplemental acquisition and development awards.
921.32 Operation and management: Implementation of the Management Plan.
921.33 Boundary changes. Amendments to the Management Plan, and addition of multiple-site components.
921.34 Program evaluation.
921.35. Withdrawal of designation.

Subpart E—Research Funds

921.40 General.
921.41 Categories of potential research projects; evaluation criteria.

Subpart F—General Financial Assistance Provisions

921.50 Application information.
921.51 Allowable costs.
921.52 Amendments to financial assistance awards.

Appendix 1—Biogeographic Classification Scheme
Appendix 2—Typology of National Estuarine Areas

Authority: Sec. 315(l), Pub. L. 92-583, as amended; 86 Stat. 1280 (16 U.S.C. 1461(1)).

Subpart A—General

§ 921.1 Mission and goals.

(a) The mission of the National Estuarine Sanctuary Program is the establishment and management, through Federal-state cooperation, of a national system of estuarine sanctuaries representative of the various regions and estuarine types in the United States. Estuarine sanctuaries will be established to provide opportunities for long-term research, education, and interpretation.

(b) The goals of the Program for carrying out this mission are:

(1) Enhance resource protection by implementing a long-term management plan tailored to the site's specific resources;

(2) Provide opportunities for long-term scientific and educational programs in estuarine areas to develop information for improved coastal decisionmaking;

(3) Enhance public awareness and understanding of the estuarine environment through resource interpretive programs; and

(4) Promote Federal-state cooperative efforts in managing estuarine areas.

(c) To assist the states in carrying out the Program's goals in an effective manner, the National Oceanic and Atmospheric Administration (NOAA) will coordinate a research and education information exchange throughout the national estuarine sanctuary system. As part of this role, NOAA will ensure that information and ideas from one sanctuary are made available to others in the system. The network that will be established will enable sanctuaries to exchange information and research data with each other, with universities engaged in estuarine research, and with Federal and state agencies. NOAA's objective is a system-wide program of research and monitoring capable of addressing the management issues that affect long-term productivity of our Nation's estuaries.

(d) Multiple uses are encouraged to the degree compatible with the sanctuary's overall purpose as provided in the management plan and consistent with subsections (a) and (b), above. Use levels are set by the individual state and analyzed in the management plan. The sanctuary management plan (see § 921.12) will describe the uses and establishes priorities among these uses. The plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. In general, sanctuaries are intended to be open to the public; low-intensity recreational and interpretive activities are generally encouraged.

(e) Certain manipulative research activities may be allowed on a limited basis, but only if specified in the management plan and only if the activity is consistent with overall sanctuary purposes and the sanctuary resources are protected. Manipulative research activities require the prior approval of the state and NOAA. Habitat manipulation for resource management purposes is not permitted within national estuarine sanctuaries.

(f) While the Program is aimed at protecting natural, pristine sites, NOAA recognizes that many estuarine areas have undergone ecological change as a result of human activities. Although restoration of degraded areas is not a primary purpose of the Program, some restorative activities may be permitted in an estuarine sanctuary as specified in the management plan.

(g) NOAA may provide financial assistance to coastal states, not to exceed 50 percent of all actual costs, to assist in the designation and operation of national estuarine sanctuaries (see section 921.51(e)). Three types of awards are available under the National Estuarine Sanctuary Program. The *preacquisition award* is for site selection and draft management plan preparation. The *acquisition and development award* is intended primarily for land acquisition and construction purposes. The *operation and management award* provides funds to assist in implementing the research, educational, and administrative

programs detailed in the sanctuary management plan. Under the Act, the Federal share of funding for a national estuarine sanctuary shall not exceed $3,000,000. At the conclusion of Federal financial assistance, funding for the long-term operation of the sanctuary becomes the responsibility of the state.

(h) Lands already in protected status by another Federal, state, local government or private organization can be included within national estuarine sanctuaries only if the managing entity commits to long-term non-manipulative management. Federal lands already in protected status cannot comprise the key land and water areas of a sanctuary (see § 921.11(c)(3)).

§ 921.2 Definitions.

(a) "Act" means the Coastal Zone Management Act, as amended, 16 U.S.C. 1451 *et seq.* Section 315(1) of the Act, 16 U.S.C. 1461(1), establishes the National Estuarine Sanctuary Program.

(b) "Assistant Administrator" (AA) means the Assistant Administrator for Ocean Services and Coastal Zone Management, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, or his/her successor or designee.

(c) "Coastal state" means a state of the United States in, or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes. For the purposes of this title, the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Marianas, and the Trust Territories of the Pacific Islands, and American Samoa (see 16 U.S.C. 1454(4)).

(d) "Estuary" means that part of a river or stream or body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes estuary-type areas of the Great Lakes, see 16 U.S.C. 1454(7).

(e) "National Estuarine Sanctuary" means and area, which may include all or the key land and water portion of an estuary, and adjacent transitional areas and uplands, constituting to the extent feasible a natural unit, set asides as a natural field laboratory to provide long-term opportunities for research, educational, and interpretation on the ecological relationships within the area (see 16 U.S.C. 1454(8)).

§ 921.3 National Estuarine Sanctuary Biogeographic Classification Scheme and Estuarine Typologies.

(a) National estuarine sanctuaries are chosen to reflect regional differences and to include a variety of ecosystem types. A biogeographic classification scheme based on regional variations in the nation's coastal zone has been developed. The biogeographic classification scheme is used to ensure that the National Estuarine Sanctuary System includes at least one site from each region. The estuarine typology system is utilized to ensure that sites in the Program reflect the wide range of estuarine types within the United States.

(b) The biogeographic classification scheme, presented in Appendix 1, contains 27 regions. Figure 2 graphically depicts the biogeographic regions of the United States.

(c) The typology system is presented in Appendix 2.

§ 921.4 Relationship to other provisions of the Coastal Zone Management Act and to the National Marine Sanctuary Program.

(a) The National Estuarine Sanctuary Program is intended to provide information to state agencies and other entities involved in coastal zone management decisionmaking pursuant to the Coastal Zone Management Act, 16 U.S.C. 1451 *et seq.* Any coastal state, including those that do not have approved coastal zone management programs under section 306 of the Act, is eligible for an award under the National Estuarine Sanctuary Program (see § 921.2(e)).

(b) Where feasible, the National Estuarine Sanctuary Program will be conducted in close coordination with the National Marine Sanctuary Program (Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 U.S.C. 1431–1434), also administered by NOAA. Title III authorizes the Secretary of Commerce to designate ocean waters as marine sanctuaries to protect or restore such areas for their conservation, recreational, ecological, or esthetic values. National marine and estuarine sanctuaries will not overlap, though they may be adjacent.

Subpart B—Preacquisition: Site Selection and Management Plan Development

§ 921.10 General.

(a) A state may apply for a preacquisition award for the purpose of site selection and preparation of documents specified in § 921.12 (draft management plan and environmental impact statement (EIS)). The total Federal share of the preacquisition award may not exceed $50,000, of which up to $10,000 may be used for site selection as described in § 921.11. Financial assistance application procedures are specified in Subpart F.

(b) In selecting a site, a state may choose to develop a multiple-site sanctuary reflecting a diversity of habitats in a single biogeographic region. A multiple-site sanctuary also allows the state to develop complementary research and educational programs within the multiple components of its sanctuary. Multiple-site sanctuaries are treated as one sanctuary in terms of financial assistance and development of an overall management framework and plan. Each individual component of a proposed multiple-site sanctuary shall be evaluated separately under § 921.11(c) as part of the site selection process. A state may propose to establish a multiple-site sanctuary at the time of the initial site selection, or at any point in the development or operation of the estuarine sanctuary, even after Federal funding for the single component sanctuary has expired. If the state decides to develop a multiple-site national estuarine sanctuary after the initial acquisition and development award is made on a single site, the proposal is subject to the requirements set forth in § 921.33. It should be noted, however, that the total funding for a multiple-site sanctuary remains at the $3,000,000 limit; the funding for operation of a multiple-site sanctuary is also limited to the $250,000 standard (see § 921.32(b)).

§ 921.11 Site selection.

(a) A state may use up to $10,000 in Federal preacquisition funds to establish and implement a site selection process which is approved by NOAA.

(b) In Addition to the requirements set forth in Subpart F, a request for Federal funds for site selection must contain the following programmatic information:

(1) A description of the proposed site selection process and how it will be implemented in conformance with the biogeographic classification scheme and typology (§ 921.3);

(2) An identification of the site selection agency and the potential management agency; and

(3) A description of how public participation will be incorporated into the process (see § 921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

(1) The site's benefit to the National Estuarine Sanctuary Program relative to the biogeographic classification scheme

and typology set forth in § 921.3 and Appendices 1 and 2;

(2) The site's ecological characteristics, including its biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests. The proposed site should, to the maximum extent possible, be a natural system;

(3) Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. National estuarine sanctuaries may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced, see § 921.51(e)(2). Importantly, however, NOAA will not approve a site for potential sanctuary status that is dependent upon the inclusion of currently protected Federal lands in order to meet the requirements for sanctuary status (such as key land and water areas). Such lands may only be included within a sanctuary to serve as a buffer or for other ancillary purposes;

(4) The site's importance for research, including proximity to existing research facilities and educational institutions; *(Comment:* NOAA is developing more detailed criteria for selecting potential national estuarine sanctuaries based upon research characteristics. Once these criteria are developed, a notice of their availability will be published in the Federal Register).

(5) The site's compatibility with existing and potential land and water uses in contiguous areas; and

(6) The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process, the state must seek the views of affected landowners, local governments, other state and Federal agencies, and other parties who are interested in the area(s) being considered for selection as a potential national estuarine sanctuary. After the local government and affected landowners have been contacted, at least one public meeting shall be held in the area of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal news media at least 15 days prior to the date of the meeting and by NOAA in the Federal Register.

§ 921.12 Management Plan development.

(a) After the selected site is approved by NOAA and the state, the state may request the remainder of the preacquisition funds to develop the draft management plan and environmental impact statement. The request must be accompanied by the information specified in Subpart F and the following programmatic information:

(1) An analysis of the site based on the biogeographic scheme/typology discussed in § 921.3 and set forth in Appendices 1 and 2;

(2) A description of the site and its major resources, including location, proposed boundaries, and adjacent land uses. Maps, including aerial photographs, are required;

(3) A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted;

(4) A list of all sites considered and a brief statement of the basis for not selecting the non-preferred sites; and

(5) A draft management plan outline (see subsection (b) below) and an outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state roles in sanctuary management during the period of federal funding and expressing the state's long-term commitment to operate and manage the sancturay.

(b) After NOAA approves the state's request to use the remaining preacquisition funds, the state shall begin developing a draft management plan. The plan will set out in detail:

(1) Sanctuary goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;

(2) An administrative section including staff roles in administration, research, education/interpretation, and surveillance and enforcement.

(3) A research plan, including a monitoring design;

(4) An interpretive plan (including interpretive, educational and recreational activities);

(5) A plan for public access to the sanctuary;

(6) A construction plan, including a proposed construction schedule, and drawings of proposed developments. If a visitor center, research center or any other facilities are proposed for construction or renovation at the site, a preliminary engineering report must be prepared;

Note.—Information on preparing a preliminary engineering report (PER) is provided in "Engineering and Construction Guidelines for Coastal Energy Impact Program Applicants" (42 FR 64830 (1977)), which is supplied to award recipients;

(7) An acquisition plan identifying the ecologically key land and water areas of the sanctuary, priority acquisitions, and strategies for acquiring these areas. This plan should identify ownership patterns within the proposed sanctuary boundaries; land already in the public domain; an estimate of the fair market value of land to be acquired; the method of acquisition, or the feasible alternatives (including less-than-fee techniques) for the protection of the estuarine area; a schedule for acquisition with an estimate of the time required to complete the proposed sanctuary; and a discussion of any anticipated problems;

Note.—As discussed in § 921.11(c)(3), if protected lands are to be included within the proposed sanctuary, the state must demonstrate to NOAA that the site meets the criteria for national estuarine sanctuary status independent of the inclusion of such protected lands.

(8) A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the sanctuary, and a strategy for sanctuary surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;

(9) If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions; and

(10) A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the national estuarine sanctuary, and expressing the long-term commitment by the state to maintain effectively the sanctuary after Federal financial assistance ends. In conjunction with the MOU and where possible under state law, the state will consider taking appropriate administrative or legislative action to ensure the long-term protection of the sanctuary. The MOU shall be signed prior to sanctuary designation. If other MOUs are necessary (such as with a federal agency or another state agency), drafts of such MOUs also must be included in the plan.

(c) Regarding the preparation of an environmental impact statement (EIS) under the National Environmental Policy Act on a national estuarine sanctuary proposal, the state shall provide all

necessary information to NOAA concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, NOAA will prepare the draft EIS.

(d) Early in the development of the draft management plan and the draft EIS, the state shall hold a meeting in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the **Federal Register** and in local media.

(e) NOAA will publish a **Federal Register** notice of intent to prepare a DEIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the DEIS will appear in the **Federal Register**. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed sanctuary. The hearing will be held no sooner than 15 days after appropriate notice by NOAA of the meeting has been given in the principal news media and in the **Federal Register**. After a 45-day comment period, a final EIS is prepared by NOAA.

Subpart C—Acquisition, Development, and Preparation of the Final Management Plan

§ 921.20 General.

After NOAA approval of the site, the draft management plan and the draft MOU, and completion of the final EIS, a state is eligible for an acquisition and development award to acquire land and water areas for inclusion in the sanctuary and to construct research and educational facilities in accordance with the draft management plan. The acquisition and development award has two phases. In the initial phase, state performance should work to meet the criteria required for formal sanctuary designation, i.e., acquiring the key land and water areas as specified in the draft management plan and preparing the final plan. These requirements are specified in § 921.30. The initial acquisition and development phase is expected to last no longer than two years after the start of the award. If necessary, a longer time period may be negotiated between the state and NOAA. After the sanctuary is designated, funds may be used to acquire any remaining land and for construction purposes.

§ 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient in: (1) Acquiring land and water areas to be included in the sanctuary boundaries; (2) minor construction, as provided in paragraphs (b) and (c) of this section; (3) preparing the final management plan; and (4) up to the point of sanctuary designation, for initial management costs, e.g., implementing the NOAA approved draft management plan, preparing the final management plan, hiring a sanctuary manager and other staff as necessary, and for other management-related activities. Application procedures are specified in Subpart F.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted under the initial acquisition and development award. No more than five (5) percent of the initial acquisition and development award may be expended on such facilities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

(d) Except as specifically provided in paragraphs (a)–(c) of this section, construction projects, to be funded in whole or in part under the acquisition and development award, may not be initiated until the sanctuary receives formal designation, see § 921.30.

Note.—The intent of these requirements and the phasing of the acquisition and development award is to ensure that substantial progress in acquiring the key land and waters areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) Deeds for real property acquired for the sanctuary under acquisition funding shall contain substantially the following provision:

Title to the property conveyed by this deed shall vest in the [recipient of the CZMA Section 315 award or other Federally-approved entity] subject to the condition that the property shall remain part of the Federally-designated [name of National Estuarine Sanctuary]. In the event that the property is no longer included as part of the sanctuary, or if the sanctuary designation of which it is part is withdrawn, then the National Oceanic and Atmospheric Administration or its successor agency, in conjunction with the State, may exercise any of the following rights regarding the disposition of the property:

(i) The recipient may be required to transfer title to the Federal Government. In such cases, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the program or project to the current fair market value of the property; or

(ii) At the discretion of the Federal Government, (a) the recipient may either be directed to sell the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (minus actual and reasonable selling and fix-up expenses, if any, from the sale proceeds); or (b) the recipient may be permitted to retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property.

Note.—Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by OMB Circular A-102 Revised, Attachment F.

(f) Prior to submitting the final management plan to NOAA for review and approval, the state should hold a public meeting in the area affected by the estuarine sanctuary. NOAA will publish a notice of the meeting in the **Federal Register** and in the local media.

Subpart D—Sanctuary Designation and Subsequent Operation

§ 921.30 Designation of National Estuarine Sanctuaries.

(a) The AA shall designate an area as a national estuarine sanctuary pursuant to Section 315 of the Act, based upon written findings that the state has met the following conditions:

(1) A final management plan has been approved by NOAA;

(2) Sanctuary construction and access policies, § 921.21(b)–(d), have been followed;

(3) Key land and water areas of the proposed sanctuary, as identified in the management plan, are under state control; and

(4) An MOU between the state and NOAA ensuring a long-term commitment by the state to the

sanctuary's effective operation and implementation has been signed.

(b) A notice of designation of a national estuarine sanctuary will be placed in the Federal Register and in the local media.

(c) The term "state control" in § 921.30(a)(3) does not necessarily require that the land be owned by the state in fee simple. Less-than-fee interests and regulatory measures may suffice where the state makes a showing that the lands are adequately controlled consistent with the purposes of the sanctuary.

§ 921.31 Supplemental acquisition and development awards.

After sanctuary designation, and as specified in the approved management plan, the state may request a supplemental acquisition and development award for construction and acquiring any remaining land. Application procedures are specified in Subpart F. Land acquisition must follow the procedures specified in § 921.21(e).

§ 921.32 Operation and management: Implementation of the Management plan.

(a) After the sanctuary is formally designated, the state may apply for assistance to provide for operation and management. The purpose of this phase in the national estuarine sanctuary process is to implement the approved final management plan and to take the necessary steps to ensure the continued effective operation of the sanctuary after direct Federal support is concluded.

(b) Federal funds of up to $250,000, to be matched by the state, are available for the operation and management of the national estuarine sanctuary. Operation and management awards are subject to the following limitations:

(1) No more than $50,000 in Federal funds per annual award; and

(2) No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities (i.e., $10,000 maximum per year).

§ 921.33 Boundary changes, amendments to the Management Plan, and addition of multiple-site components.

(a) Changes in sanctuary boundaries and major changes to the final management plan, including state laws or regulations promulgated specifically for the sanctuary, may be made only after written approval by NOAA. If determined to be necessary, NOAA may require public notice including notice in the Federal Register and an opportunity for comment. Changes in the boundary involving the acquisition of properties not listed in the management plan or final EIS require public notice and the opportunity for comment; in certain cases, an environmental assessment may be required. Where public notice is required, NOAA will place a notice in the Federal Register of any proposed changes in sanctuary boundaries or proposed major changes to the final management plan and ensure that a notice is published in the local media.

(b) As discussed in § 921.10(b), a state may choose to develop a multiple-site national estuarine sanctuary after the initial acquisition and development award for a single site has been made. Public notice of the proposed addition in the Federal Register and local media, and the opportunity for comment, in addition to the preparation of either an environmental assessment or environment impact statement on the proposal will be required. An environmental impact statement, if required, will be prepared in accordance with section 921.12 and will also include an administrative framework for the multiple-site sanctuary that describes the complementary research and educational programs within the sanctuary. If NOAA determines, based on the scope of the project and the issues associated with the additional site, that an environmental assessment is sufficient to establish a mulitple-site sanctuary, then the state shall develop a revised management plan as described in § 921.12(b). The revised management plan will address the sanctuary-wide goals and objectives and the additional component's relationship to the original site.

§ 921.34 Program evaluation.

(a) Performance during the term of the operation and management award (or under the initial acquisition and development award, if the sanctuary is not designated within two years) will be evaluated annually by the Program Office and periodically in accordance with the provisions of Section 312 of the Act to determine compliance with the conditions of the award and overall progress in implementing the management plan.

(b) To ensure effective sanctuary oversight after the major federal funding expires, the state is required to submit an annual report on the sanctuary. The report should detail program successes and accomplishments in meeting the policies and activities described in the sanctuary management plan. A work plan, detailing the projects to be undertaken the next year to meet the Program goals and the state's role in ongoing sanctuary programs, should also be included. Inadequate annual reports will trigger a full-scale management audit with a site-visit. On a periodic basis, NOAA will also conduct a full-scale Section 312 evaluation with a site visit and public meeting.

§ 921.35 Withdrawal of designation.

(a) Upon a finding by the Program Office through its programmatic evaluation (§ 921.34) that a national estuarine sanctuary is not meeting the mandate of Section 315 of the Act, the national Program goals or the policies established in the management plan, NOAA will provide the state with a written notice of the deficiency. Such a notice will explain the deficiencies in the state's approach, propose a solution or solutions to the deficiency and provide a schedule by which the state should remedy the deficiency. The state shall also be advised in writing that it may comment on the Program Office's finding of a deficiency and meet with Program officials to discuss the finding and seek to remedy the deficiency.

(b) If the issues cannot be resolved within a reasonable time, the Program Office will make recommendation regarding withdrawal of designation to the AA. A notice of intent to withdraw designation, with an opportunity for comment, will be placed in the Federal Register.

(c) The state shall be provided the opportunity for an informal hearing before the AA to consider the Program Office's recommendation and finding of deficiency, as well as the state's comments on and response to the recommendation and finding.

(d) Within 30 day after the informal hearing, the AA shall issue a written decision regarding the sanctuary. If a decision is made to withdraw sanctuary designation, the procedures specified in § 921.21(e) regarding the disposition of real property acquired with federal funds shall be followed.

Subpart E—Research Funds

§ 921.40 General.

(a) To stimulate high quality research within designated national estuarine sanctuaries, NOAA may find research on a competitive basis to sanctuaries having an approval final management plan. Research funds are intended to support significant research projects that will lead to enhanced scientific understanding of the sanctuary environment, improved coastal decisionmaking, improved sanctuary management, or enhanced public appreciation and understanding of the sanctuary ecosystem. Research opportunities will be identified in final

management plans for national estuarine sanctuaries. Research funds will be used to fill obvious voids in available data, as well as to support creative or innovative projects.

(b) Research funds are provided in addition to any funds available to the state under the operation and management or acquisition and development awards. Research funds must be matched by the state, consistent with § 921.51(e)(iii) ("allowable costs"). Individual states may apply for funding for more than one research project per sanctuary.

§ 921.41 Categories of potential research project; evaluation criteria.

(a) While research funds may be used to start-up long-term projects, they are not intended as a source of continuing funding for a particular project over time. Emphasis will be placed on projects that are also of benefit to other sanctuaries in the system. Proposals for research under the following categories will be considered:

(1) Establishing a Data Base and Monitoring Program (e.g., studies related to gathering and interpreting baseline information on the estuary. Funds are available to establish a data base and monitoring system; however, the long-term support for such a system must be carried out as part of overall sanctuary implementation);

(2) Estuarine Ecology (e.g., studies of the relationships between estuarine species and their environment, studies of biological populations community relationships, studies on factors and processes that govern the biological productivity of the estuary);

(3) Estuarine Processes (e.g., studies on dynamic physical processes that influence and give the estuary its particular physical characteristics, including studies related to climate, patterns of watershed drainage and freshwater inflow, patterns of water circulation within the estuary, and studies on oceanic or terrestrial factors that influence the condition of estuarine waters and bottoms);

(4) Applied Research (e.g., studies designed to answer specific management questions); and

(5) Socioeconomic Research (e.g., studies on patterns of land use, sanctuary visitation, archaeological research).

(b) Proposals for research in national estuarine sanctuaries will be evaluated in accordance with criteria listed below:

(1) Scientific merits;

(2) Relevance or importance to sanctuary management or coastal decisionmaking;

(3) Research quality (i.e., soundness of approach, environmental consequences, experience related to methodologies);

(4) Importance to the National Estuarine Sanctuary Program;

(5) Budget and Institutional Capabilities (i.e., reasonableness of budget, sufficiency of logistical support); and

(6) In addition, in the case of long-term monitoring projects, the ability of the state or the research grant recipient to support the grant beyond this initial funding.

Subpart F—General Financial Assistance Provisions

§ 921.50 Application information.

(a) The maximum total Federal funding per sanctuary is $3,000,000 for the preacquisition, acquisition and development, and operation and management awards. The research funding under § 921.40 is excluded from this total.

(b) Only a state Governor, or his/her designated state agency, may apply for national estuarine sanctuary financial assistance awards. If a state is participating in the national Coastal Zone Management Progam, the recipient of an award under Section 315 of the Act shall consult with the state coastal management agency regarding the application.

(c) No acquisition and development award may be made by NOAA without the approval of the Governor of the state, or his/her designated agency, in which the land to be acquired is located.

(d) All applications are to be submitted to: Management and Budget Group, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 3300 Whitehaven St., NW., Washington, D.C. 20235.

(e) An original and two copies of the complete application must be submitted at least 120 working days prior to the proposed beginning of the project. The Application for Federal Assistance Standard Form 424 (Non-construction Program) constitutes the formal application for preacquisition, operation and management, and research awards. The Application for Federal Assistance Standard Form 424 (Construction Program) constitutes the formal application for land acquisition and development awards. The application must be accompanied by the information required in Subpart B (preacquisition), Subpart C and Section 921.31 (acquisition and development), and § 921.32 (operation and management), as applicable. All applications must contain back up data for budget estimates (Federal and non-Federal shares), and evidence that the application complies with the Executive Order 12372, "Intergovernmental Review of Federal Programs." In addition, applications for acquisition and development awards must contain:

(1) State Historic Preservation Office comments;

(2) Appraisals and title information;

(3) Governor's letter approving the sanctuary proposal; and

(4) Written approval from NOAA of the draft or final management plan.

The Standard Form 424 has been approved by the Office of Management and Budget (Approval number 0648-0121) for use through September 30, 1986.

§ 921.51 Allowable costs.

(a) Allowable costs will be determined in accordance with OMB Circulars A-102, "Uniform Administrative Requirements for Grants-in-Aid to State and Local Governments", and A-87, "Principles for Determining Costs Applicable to Grants and Contracts with State, Local, and Federally Recognized Indian Tribal Governments"; the financial assistance agreement; these regulations; and other Department of Commerce and NOAA directives. The term "costs" applies to both the Federal and non-Federal shares.

(b) Costs claimed as charges to the award must be reasonable, beneficial and necessary for the proper and efficient administration of the financial assistance award and must be incurred during the awards period, except as provided under preagreement costs, subsection (d).

(c) Costs must not be allocable to or included as a cost of any other Federally-financed program in either the current or a prior award period.

(d) Costs incurred prior to the effective date of the award (preagreement costs) are allowable only when specifically approved in the financial assistance agreement. For non-construction awards, costs incurred more than three months before the award beginning date will not be approved. For construction and land acquisition awards, NOAA will evaluate preagreement costs on a case-by-case basis.

(e) General guidelines for the non-Federal share are contained in OMB Circular A-102, Attachment F. The following may be used by the state in satisfying the matching requirement:

(1) *Preacquisition Awards.* Cash and in-kind contributions (value of goods

and services directly benefiting and specifically identifiable to this part of the project) are allowable. Land may not be used as match.

(2) *Acquisition and Development Awards.* Cash and in-kind contributions are allowable. In general, the fair market value of lands to be included within the sanctuary boundaries and acquired pursuant to the Act, with other than Federal funds, may be used as match. The fair market value of privately donated land, at the time of donation, as establishment by an independent appraiser and certified by a responsible official of the State (pursuant to OMB Circular A–102 Revised, Attachment F) may also be used as match. Appraisals must be performed according to Federal appraisal standards as detailed in NOAA regulations and the "Uniform Appraisal Standards for Federal Land Acquisitions." Costs related to land acquisition, such as appraisals, legal fees and surveys, may also be used as match. Land, including submerged lands, already in the state's possession, in a fully-protected status consistent with the purposes of the National Estuarine Sanctuary Program, may be used as match only if it was acquired within a one-year period prior to the award of preacquisition or acquisition funds and with the intent to establish a national estuarine sanctuary. For state lands not in a fully-protected status (e.g., a state park containing an easement for subsurface mineral rights), the value of the development right or foregone value may be used as match if acquired by or donated to the state for inclusion within the sanctuary.

A state may initially use as match land valued at greater than the Federal share of the acquisition and development award. The value in excess of the amount required as match for the initial award may be used to match subsequent supplemental acquisition and development awards for the estuarine sanctuary.

(3) *Operations and Management Awards; Research Funds.* Cash and in-kind contributions (directly benefiting and specifically identifiable to this phase of the project), except land, are allowable.

§ 921.52 Amendments to financial assistance awards.

Actions requiring an amendment to the financial assistance award, such as a request for additional Federal funds, revisions of the approved project budget, or extension of the performance period must be submitted to NOAA on Standard Form 424 (OMB approved number 0748–0121 for use through September 30, 1988) and approved in writing.

Appendix 1—Biographic Classification Scheme

Acadian

1. Northern Gulf of Maine (Eastport to the Sheepscot River).
2. Southern Gulf of Maine (Sheepscot River to Cape Cod).

Virginian

3. Southern New England (Cape Cod to Sandy Hook).
4. Middle Atlantic (Sandy Hook to Cape Hatteras).
5. Chesapeake Bay.

Carolinian

6. Northern Carolinas (Cape Hatteras to Santee River).
7. South Atlantic (Santee River to St. John's River).
8. East Florida (St. John's River to Cape Canaveral).

West Indian

9. Caribbean (Cape Canaveral to Ft. Jefferson and south).
10. West Florida (Ft. Jefferson to Cedar Key).

Louisianian

11. Panhandle Coast (Cedar Key to Mobile Bay).
12. Mississippi Delta (Mobile Bay to Galveston).
13. Western Gulf (Galveston to Mexican border).

Californian

14. Southern California (Mexican border to Point Concepcion).
15. Central California (Point Concepcion to Cape Mendocino).
16. San Francisco Bay.

Columbian

17. Middle Pacific (Cape Mendocino to the Columbia River).
18. Washington Coast (Columbia River to Vancouver Island).
19. Puget Sound.

Great Lakes

20. Western Lakes (Superior, Michigan, Huron).
21. Eastern Lakes (Ontario, Erie).

Fjord

22. Southern Alaska (Prince of Wales Island to Cook Inlet).
23. Aleutian Islands (Cook Inlet to Bristol Bay).

Sub-Arctic

24. Northern Alaska (Bristol Bay to Demarcation Point).

Insular

25. Hawaiian Islands.
26. Western Pacific Island.
27. Eastern Pacific Island.

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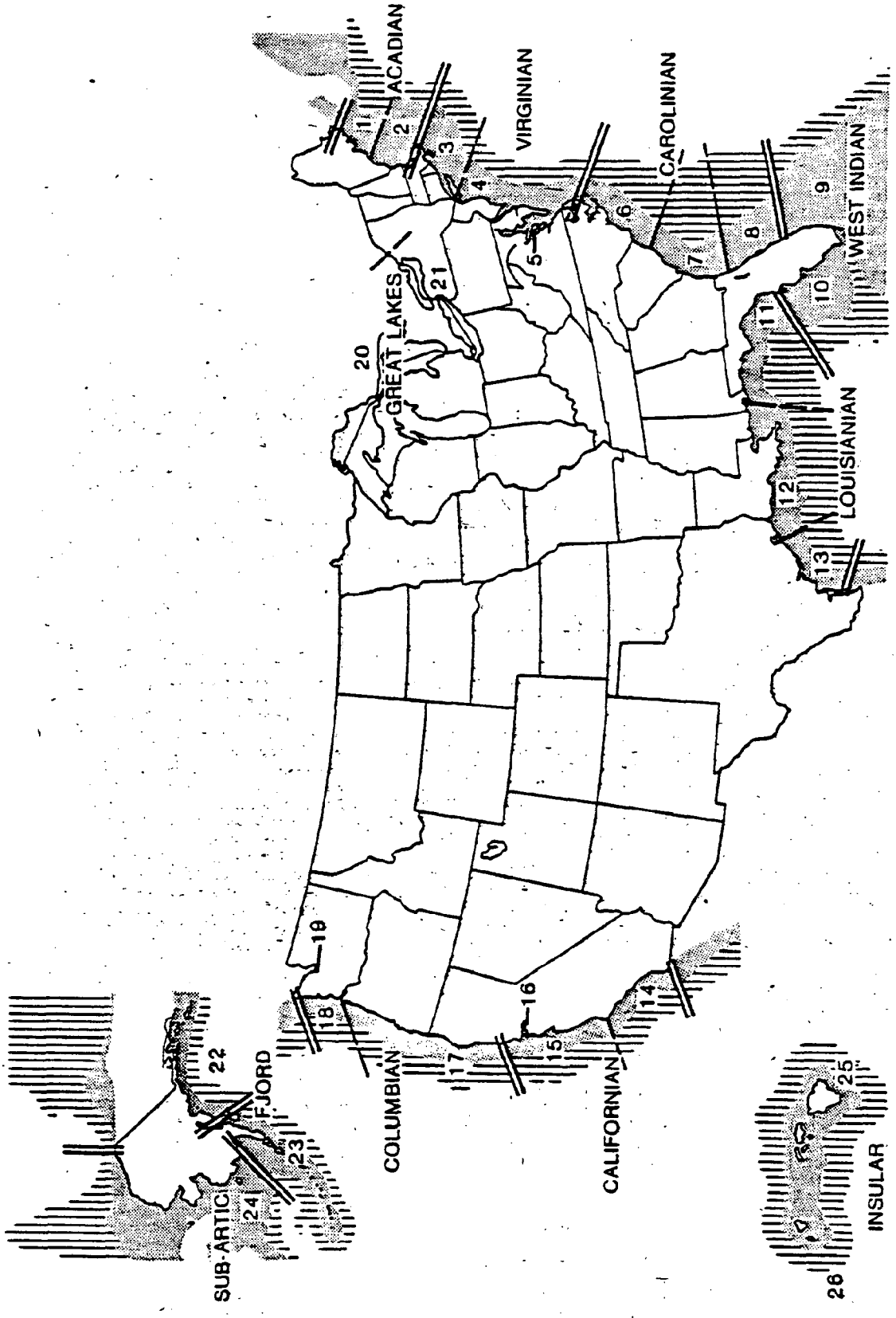

Figure 1. Biogeographic Regions of the United States.

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Appendix 2—Typology of National Estuarine Areas

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine sanctuaries. Priority will be given to important ecosystem type as yet unrepresented in the sanctuary system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I—Ecosystem Types

Group I—Shorelands

A. *Maritime Forest-Woodland:* This type of ecosystem consists of single-stemmed species that have developed under the influence of salt spray. It can be found on coastal uplands or recent features, such as barrier islands and beaches, and may be divided into the following biomes:

1. *Northern Coniferous Forest Biome:* This is an area of predominantly evergeens such as the sitka spruce (*Picea*), grand fir (*Abies*), and white cedar (*Thuja*), with poor development of the shrub and herb layers, but high annual productivity and pronounced seasonal periodicity.

2. *Moist Temperate (Mesothermal) Coniferous Forest Biome:* Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has a relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.

3. *Temperate Deciduous Forest Biome:* This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern, well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distant subdivision of this biome is the *pine edaphic forest* of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. *Broad-leaved Evergreen Subtropical Forest Biomes:* The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarind, strangler fig, gumbo limbo, and palms.

B. *Coast Shrublands:* This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. *Northern Areas:* Characterized by *Hudsonia*, various erinaceous species, and thickets of *Myrica*, *Prunus*, and *Rosa*.

2. *Southeast Areas:* Floral dominants include *Myrica*, *Baccharis*, and *Ilex*.

3. *Western Areas: Adenostoma*, *Arcotyphylos*, and *Eucalyptus* are the dominant floral species.

C. *Coastal Grasslands:* This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (2 to 4 feet tall), such as *Ammophila*, *Agropyron*, and *Calamovilfa*, tall grasses (5 to 8 feet tall), such as *Spartina*, and trees such as the willow (*Salix* sp.), cherry (*Prunus* sp.), and cottonwood (*Populus deltoides*). This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: *Elymus;*
2. Northeast/West: *Ammophila;*
3. Southeast/Gulf: *Uniola;* and
4. Mid-Atlantic/Gulf: *Spartina patens.*

D. *Coastal Tundra:* This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as *Empetrum nigrum* and *Betula nana*, the lichens *Cetraria* and *Cladonia*, and herbaceous plants such as *Potentilla tridentata* and *Rubus chamaemorus*. Common species on the coastal beach ridges of the high arctic desert include *Dryas intergrifolia* and *Saxifrage oppositifolia*.

This area can be divided into two main subdivisions:

1. *Low Tundra:* characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. *High Tundra:* a bare area except for a scanty growth of lichens and grasses, with underlying ice wedges forming raised polygonal areas.

E. *Coastal Cliffs:* This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and "higher" plant representatives.

Group II—Transition Areas

A. *Coastal Marshes:* These are wetland areas dominated by grasses (Poacea), sedges (Cyperaceae), rushes (Juncaceae), cattails (Typhaceae), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) tidal, which is periodically flooded by either salt or brackish water; (b) non-tidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serves important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. *Coastal Swamps:* These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. *Coastal Mangroves:* This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by variety of salt-tolerant trees, such as the red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia nitida*), and the white mangrove (*Laguncularia racemosa*). It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. *Intertidal Beaches:* This ecosystem has a distinct biota of microscopic animals, bacteria, and unicelluar algae along with macroscopic crustaceans, mollusks, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (*Emerita*), amphipods (Gammaridae), ghost crabs (*Ocypode*), and bivalve molluscs such as the coquina (*Donax*) and surf clams (*Spisula* and *Mactra*).

E. *Intertidal Mud and Sand Flats:* These areas are composed of unconsolidated, high organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dino-flagellates, filamentous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell *Donax*, the scallop *Pecten*, tellin shells *Tellina*, the heart urchin *Echinocardium*, the lug worm *Arenicola*, sand dollar *Dendraster*, and the sea pansy *Renilla*. In mud, faunal dominants adapted to low oxygen levels include the terebellid *Amphitrite*, the boring clam *Playdon*, the deep sea scallop *Placopecten*, the quahog *Mercenaria*, the echiurid worm *Urechis*, the mud snail *Nassarius*, and the sea cucumber *Thyone*.

F. *Intertidal Algal Beds:* These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. *Northern Latitude Rocky Shores:* It is in this region that the community structure is best developed. The dominant algal species include *Chondrus* at the low tide level, *Fucus* and *Ascophyllum* at the mid-tidal level, and *Laminaria* and other kelp-like algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.

2. *Southern Latitudes:* The communities in this region are reduced in comparison to

those of the northern latitudes and possesses algae consisting mostly of single-celled or filamentous green, blue-green, and red algae, and small thalloid brown algae.

3. *Tropical and Subtropical Latitudes:* The intertidal in this region is very reduced and contains numerous calcareous algae such as *Porolithon* and *Lithothamnion*, as well as green algae with calcareous particles such as *Halimeda*, and numerous other green, red, and brown algae.

Group III—Submerged Bottoms

A. *Subtidal Hardbottoms:* This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as kelp, may also be found.

B. *Subtidal Softbottoms:* Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. *Subtidal Plants:* This system is found in relatively shallow water (less than 8 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions, manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass *Zostera marina* predominates. In the South Atlantic and Gulf coast areas, *Thalassia* and *Diplanthera* predominate. The grasses in both areas support a number of epiphytic organisms.

Class II—Physical Characteristics

Group I—Geologic

A. *Basin Type:* Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. *Exposed Coast:* Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area, making them chief stabilizers of the ocean shorefront.

2. *Sheltered Coast:* Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters—abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects of pollution being more severe in this area than in exposed coastal areas.

3. *Bay:* Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced, the flushing action is augmented by river discharge. Bays vary in size and in type of shorefront.

4. *Embayment:* A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.

5. *Tidal River:* The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.

6. *Lagoon:* Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.

7. *Perched Coastal Wetlands:* Unique to Pacific islands, this wetland type, found above sea level in volcanic crater remnants, forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. Example: Aunu'u Island, American Samoa.

8. *Anchialine Systems:* These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs, have only a subsurface connection to the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthic algae such as *Rhizoclonium*, the mineral encrusting *Schizothrix*, and the vascular plant *Ruppia maritima*. Characteristic fauna, which exhibit a high degree of endemicity, include the mollusks *Theodoxus neglectus* and *T. carlosus*, the small red shrimp *Metabetaeus lohena* and *Halocaridina rubra*, and the fish *Eleotris sandwicensis* and *Kuhlia sandvicensus*. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. *Basin Structure:* Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. *Coastal plains estuary:* Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular, forming a simple coastal plains estuary. When a channel is flooded with numerous tributaries, an irregular estuary results. Many estuaries of the eastern United States are of this type.

2. *Fjord:* Estuaries that form in elongated, steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume, river discharge is small. But many fjords have restricted tidal ranges at their mouths, due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800 m to 1200 m, while sill depths usually range from 40 m to 150 m.

3. *Bar-bounded Estuary:* These result from the development of an offshore barrier, such as a beach strand, a line of barrier islands, reef formations, a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars or barrier islands, broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent sea level rises.

4. *Tectonic Estuary:* These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding, or movement of the earth's bedrock, often with a large inflow of freshwater.

5. *Volcanic Estuary:* These coastal bodies of open water, a result of volcanic processes, are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic origin.

C. *Inlet Type:* Inlets in various forms are an integral part of the estuarine environment, as they regulate, to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea. There are four major types of inlets:

1. *Unrestricted:* An estuary with a wide, unrestricted inlet typically has slow currents, no significant turbulence, and receive the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.

2. *Restricted:* Restrictions of estuaries can exist in many forms: bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a

tidal wave, or *bore*. Such currents exert profound effects on the nature of the substrate, turbidity, and biota of the estuary.

3. *Permanent:* Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea. Sedimentation and deposition are minimal.

4. *Temporary (Intermittent):* Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea and sound waters, the frequency of storms, and the amount of littoral transport.

D. *Bottom Composition:* The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. *Sand:* Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shores and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a graduation toward finer particles in the head of the estuary. In the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.

2. *Mud:* At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silt, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.

3. *Rock:* Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. *Oyster shell:* Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

Group II—Hydrographic

A. *Circulation:* Circulation patterns are the result of the combined influences of freshwater flow, tidal action, wind and oceanic forces, and serve many functions: nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. *Stratified:* This is typical of estuaries with a strong freshwater influx and is commonly found in bays formed from "drowned" river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.

2. *Non-stratified:* Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.

3. *Lagoonal:* An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater influx and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation, whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. *Tides:* This is the most important ecological factor in an estuary, as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of their cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as *datum*. The tides, although complex, falls into three main categories:

1. *Diurnal:* This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.

2. *Semidiurnal:* This refers to a twice daily rise and fall in water that can be observed along the shoreline.

3. *Wind/Storm Tides:* This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. *Freshwater:* According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the land either from a surface and/or subsurface source.

1. *Surface water:* This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.

2. *Subsurface water:* This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water:

a. *Vadose water:* This is water in the soil above the water table. Its volume with respect to the soil, is subject to considerable fluctuation.

b. *Groundwater:* This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land, being high below hills and sloping into valleys.

Group III—Chemical

A. *Salinity:* This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand—ppt).

1. *Positive estuary:* This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.

2. *Negative estuary:* This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.

3. *Salinity zones (expressed in ppt):*

a. *Hyperhaline*—greater than 40 ppt.

b. *Euhaline*—40 ppt to 30 ppt.

c. *Mixohaline:* 30 ppt to 0.5 ppt.

(1) Mixoeuhaline—greater than 30 ppt but less than the adjacent euhaline sea.

(2) Polyhaline—30 ppt to 18 ppt.

(3) Mesohaline—18 ppt to 5 ppt.

(4) Oligohaline—5 ppt to 0.5 ppt.

d. *Limnetic:* Less than 0.5 ppt.

B. *pH Regime:* This is indicative of the mineral richness of estuarine waters and fall into three main categories:

1. *Acid:* Waters with a pH of less than 5.5.

2. *Circumneutral:* A condition where the pH ranges from 5.5 to 7.4.

3. *Alkaline:* Waters with a pH greater than 7.4.

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APPENDIX 2

Massachusetts/Town of Mashpee - South Cape Beach Agreement

AMENDED AGREEMENT

Agreement entered into this 29 day of June in the year 1981, by and between the Town of Mashpee and the Commonwealth of Massachusetts acting through the Commissioner of the Department of Environmental Management (DEM) pursuant to Chapter 1058 of the Acts of 1971, as amended whereby DEM is authorized to acquire by gift, purchase or eminent domain South Cape Beach in the Town of Mashpee.

WHEREAS, the aforementioned parties entered into an agreement dated September 22, 1980 by substituting in its entirety therefor this Amended Agreement and all the provisions, covenants, and condition wherein contained.

IN CONSIDERATION OF the mutual covenants herein contained and expressed and for other good and valuable consideration the parties mutually covenant and agree as follows:

(1) That development and use of the park shall be limited to bathing, sunning, hiking, fishing, nature interpretation, non-motorized biking, and associated passive enjoyment through recreational use consistent with the fragile ecology of the site, which shall expressly exclude overnight camping, and private vehicles, except only as provided for in paragraph (4) below. Any proposed recreational use not specified in this paragraph shall first be submitted to South Cape Beach Advisory Committee for it review and recommendation.

(2) That all park facilities will be designed, sited and maintained so that they do not harm the natural and scenic qualities of the area. The Executive Order for Barrier Beaches of Governor Edward J. King signed August 8, 1980, (attached as "Exhibit A") shall be incorporated by reference into this Agreement and the Department will undertake to enforce all its provisions throughout the area designated as South Cape Beach State Park

(3) That the Department will manage the fragile wetland, dune and upland areas of the site to prevent erosion and to preserve critical habitat and the area's natural scenic qualities. Local ordinance and bylaws now effective will be incorporated into and made part of the park's rules and regulations and shall govern and control, provided no legal conflict exists. No park rule or regulation will permit an activity or use otherwise prohibited by the rules, regulations and bylaws of the Town of Mashpee in existence as of the date of executiion of this Agreement.

(4) That the Department may allow vehicle access to designated service roads for the sole pupose of access to fishing areas to persons over sixty years of age, those suffering from ambulatory disabilities, or holding disabled veteran status. Said access shall be by permit only, restricted to a maximum of six vehicles at any one time, and such travel shall be allowed only between the hours of sunset and sunrise. Such vehicles shall be limited to designated ways and shall in no circumstances be driven off the designated route onto sand or other unimproved terrain or used for overnight stays. Any violations of the permit provisions shall, upon finding of violation by the South Cape Advisory Committee, cause the revocation of said permits.

In the event the above provisions are deemed discriminatory under the law, such use of vehicles shall be prohibited altogether. In no event, and under no circumstance shall there ever be an increase in said vehicle use above the 6 maximum herein provided for.

(5) That parking shall be limited to several landscaped sites, with a total maximum capacity of no more than 400 vehicles. Buses will be allowed by permit only. Such parking areas shall be finished with a permeable or semi-permeable material acceptable to the South Cape Beach Advisory Committee. The parking area shall be, if at all feasible, on land purchased in fee by the Department. Failing the reaching of agreement for such negotiated purchase, the Department will exercise rights available for taking by eminent domain. In any event and however acquired the Department will promptly initiate and expeditiously support legislation which will authorize the Department to deed, subject to conservation and other restrictions contained herein, said land to the Town of Mashpee for a nominal consideration of one dollar; and the Town, covenants, in turn, that it shall promptly execute a renewable lease to the Department for a period of 99 years for a nominal consideration of one dollar, said land, which lease shall contain a right to re-entry for breach of any one of the covenants and conditions contained herein. It is expressly covenanted and agreed that no other land within the park other than that specifically designated and identified in accordance with these provisions will be used as a parking area or for purposes of public parking.

(6) All Town owned land acquired by the Department will be acquired by Deed of the Town conveying the subject land in fee simple.

(7) Any land in private ownership purchased by the Department for parking purposes shall be subject to a restriction limiting use to the Department to 400 cars; and all the other condition contained in this Agreement.

(8) The Department shall be responsible for a management system for traffic control on Great Oak Road and its point of intersection with other roads leading into the Park, to insure orderly traffic.

(9) The acquistion by the Commonwealth of 432 acres, more or less, is an express condition precedent to the legal existence of this Agreement. In the event that the acquistion by the state is less than 432 acres, this Agreement may, at the exclusive option of the Town of Mashpee, be terminated and declared void. The parcel of land to be acquired is the Southerly portion of the the Town of Mashpee, bounded on the West by Waquoit Bay, on the South by Nantucket Sound, and on the East by Great Flat Pond.

(10) That primary effort shall be made by the Department to negotiate purchase of the aforementioned privately owned lands.

(11) That recognizing the possibility that all such privately owned lands within the proposed boundaries of the Park may not be able to be acquired through negotiated purchase, the Department will consider the exercise of its power of eminent domain.

(12) That any specific taking by eminent domain would be considered only when efforts for a negotiated purchase have failed despite due diligence by the Department to reach a settlement; or when title to the land in question is of such unmarketability that remedial title action would be impractical.

(13) That the Mashpee Board of Selectmen will grant the Department eminent domain authority by appropriate vote for the purpose of acquisition of the proposed South Cape Beach State Park.

(14) That as a result of the proposed development of the Park, it may be necessary for the Department to acquire all municipally owned lands within the proposed boundaries of the Park. These lands include the existing town beach, a portion of Great Oak Road and other isolated parcels standing in the name of the Town of Mashpee.

(15) That such acquisition of town owned lands would be in the form of land exchange in which the Town would received from the Commonwealth land of equal value adjacent to the existing town beach. In conjunction with any exchange, the Department will make improvements to Great Oak Road, from its intersection with Red Brook Road all the way to the Beach. In addition, the Department will assume costs associated with the relocation of the town beach, including the cost of a new access road, parking areas and necessary fencing and other essential improvements. Said town beach will be to the east of the state beach in the area of Great Flat Pond and shall consist of approximately 30 acres and shall have an ocean frontage of approximately 1700 linear feet. (Map attached and incorporated by reference "Exhibit B").

(16) That the town regards as recreation/conservation lands, all properties which may be transferred to the Department in any land exchange in conjunction with the establishment of the Park.

(17) That the Department will reserve a suitable site on Great River, Waquoit Bay for future use and development by the Town of Mashpee for construction for a boat launch/pier facility, the metes and bounds to be mutually agreed upon by the Town of Mashpee and the Department. The area, or site, is to be no less than 10 acres with access to and from Wills Work Road. The Department will construct an improved access road to said facility and will seek on behalf of the Town of Mashpee such state funds that are available for municipal boat launching facilities. In furtherance of the above, the Department will initiate and support legislation transferring title of said site to the Town of Mashpee. In the event such legislation fails of passage, the Department will lease such land to the Town of Mashpee for a period of ninety-nine years for nominal consideration of one dollar.

(18) That the Department shall at all times continue to recognize a South Cape Beach State Park Advisory Committee comprised of eleven (11) voting members and four (4) ex-officio, non-voting members. The voting membership of the Committee shall consist of the following eight (8) residents of or representatives for the Town to be appointed by the Board of Selectmen of the Town, and one (1) resident of or representative for the Town of Sandwich,

Falmouth, and Barnstable to be appointed by those respective Boards of Selectmen. The non-voting membership of the Committee shall consist of one (1) representative each from the Office of Coastal Zone Management and the Department of Fisheries, Wildlife and Recreational Vehicles to be appointed by their respective agency heads, together with the sitting State Representative of the Third Barnstable Representative District and the State Senator from the Cape and Islands Senatorial District. All succeeding members shall be appointed in the same manner as stated above. The terms of all voting members shall be (3) years.

(19) That the Committee shall continue to be responsible for making recommendations to the Department on such matters to include, but not be limited to, park management and operations, rules and regulations, design and plan review. The Department, when possible, shall submit to the Committee for review all architectural and design plans and construction plans for facilities including structures roadways, and parking areas in an effort to accomplish the project. The Department will include a clause in the project's design contracts providing for periodic review by the Committee during the duration of the contract. The provisions of this agreement shall not be amended or changed without the express consent in writing of all parties thereto, except as otherwise provided for in paragraph 20 below. Except as provided for in such amendments this agreement shall be for a term of ninety nine (99) years. The parties agree to renew those provisions contained herein which otherwise expire by operation of law.

(20) The passage of legislation, by the General Court of the Commonwealth, incorporating and adopting all the terms, provisions, conditions and restrictions contained in this Agreement shall be an express condition precedent to the legal existence and enforceability of this Agreement, to the contemplated transfer of Town owned land to the Department and to the Authority for Acquisition of land to be granted by the Board of Selectmen of the Town of Mashpee. In the event that all the terms, provisions, conditions and restrictions are not incorporated and adopted into legislation, the Town, at its sole option, may elect to terminate this Agreement, or in the alternative amend this Agreement to conform to the legislation as enacted, in which event the Agreement, as amended, shall be binding upon all the parties thereto.

(21) The acceptance of Deeds by the Department to Town owned lands shall not be deemed, and in fact shall not be legally construed to be a full performance and discharge of the terms, conditions, provisions and restrictions of this Agreement; rather, it is expressly agreed and understood that this Agreement and all its terms, conditions, provisions and restrictions shall survive the delivery of Deeds, and shall thereafter be fully enforceable in all aspects thereof.

(22) It is expressly agreed that the terms, conditions, provision and restrictions herein contained shall be specifically enforceable, in law or equity, by a Court of competent jurisdiction, and that standing in any action shall be given to the Town of Mashpee or to any ten (10) citizens domiciled in the Commonwealth of Massachusetts.

CERTIFICATE OF VOTE

At a meeting of the Board of Selectmen of the Town of Mashpee, Barnstable County, in the Commonwealth of Massachusetts, said meeting being held on July 15, 1981, having been duly called and a quorom being present and voting, upon motion duly made and seconded, it was,

VOTED: That the Commissioner of Environmental Management be, and is hereby authorized, pursuant to the provisions of Chapter 132A, Sections 3 and 3A of the General Laws, and Chapter 1058 of the Acts of 1971 as amended to acquire by eminent domain all that land as shown on a two sheet plan entitled, "Plan of Land-South Cape Beach - Mashpee, Mass. - prepared for Dept. of Environmental Management - Scale 1" = 200' Feb. 16, 1976 - Briggs Engineering & Testing Co.", on file with said Department, provided however, that no land owned by the Town of Mashpee shall be taken. The approval and vote hereunder is expressly subject to and conditional upon the full performance and compliance by both the Commonwealth of Massachusetts and the Department of Environmental Management of the terms, promises, covenants and conditions all of which are included and incorporated into a written agreement entitle "Amended Agreement" dated June 29, 1981 between the Town of Mashpee and the Commonwealth of Massachusetts acting through the Commissioner of the Department of Environmental Management, a copy of which agreement is attached hereto, incorporated and made part of the Certificate of Vote; the approval and vote hereunder is also expressly conditional upon the passage of Legislation by the General Court of the Commonwealth incorporating and adopting all the terms, provisions, conditions and restrictions contained in the agreement dated June 29, 1981. The Board of Selectmen reserve to itself the unconditional right to rescind and cancel the within vote for breach of any of the conditions above stated.

(Signed by Mashpee Board of Selectmen)

APPENDIX 3

Waquoit Bay Area of Critical Environmental Concern Designation Document

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

EDWARD J. KING
GOVERNOR

JOHN A. BEWICK
SECRETARY

Designation of Waquoit Bay as an
Area of Critical Environmental Concern
and Supporting Findings

Following an extensive process, including nomination, research, informal meetings with local groups, public informational meetings, public hearings, on-site visits, and a formal evaluation of all assembled data, I, the Secretary of Environmental Affairs, hereby designate Waquoit Bay an Area of Critical Environmental Concern pursuant to the authority granted to me by G.L. c. 21A, s. 2(7).

I also hereby, find that the Waquoit Bay ACEC is significant to flood control, the prevention of storm damage, the protection of land containing shellfish and fisheries; public interests protected by the Wetlands Protection Act, G.L. c. 131, §40.

1. Boundary of the Waquoit Bay ACEC

The Area of Critical Environmental Concern (ACEC) extends from the extreme southwestern end of Dead Neck barrier beach (mean low water, MLW) and extends straight across the entrance channel to Waquoit Bay by the shortest distance to the mean low water line of the western side of the entrance channel. The ACEC boundary then follows the MLW line in a westerly direction (excluding the western jetty of the Waquoit Bay entrance channel) to a point approximately 1370 feet (straight line measure) from the westernmost tip of Washburn Island. This point falls on a line perpendicular to the MLW line of Vineyard Sound and tangent to a segment of shoreline which is both the southeast MLW shoreline of Eel Pond and a western edge of Washburn Island.

The ACEC boundary then follows that perpendicular line to the intersection with the western MLW shore of Washburn Island. The boundary follows the MLW line along the Washburn Island to its extreme northeastern point. The boundary then extends from this point north into Waquoit Bay by the shortest distance to the 6 foot depth curve (datum: MLW). The boundary follows the 6 foot depth curve in a northerly direction to the point of intersection with a true azimuth bearing line of 150°, drawn from the southwestern most point of shoreline of the un-named pond east of Seapit Road. From this point of intersection the ACEC boundary then follows this above-mentioned bearing line in a northwesterly direction to the southwestern most point of shoreline of the un-named pond east of Seapit Road and continues along an extension of this straight line to the intersection with the 100 year flood boundary still east of Seapit Road.

The ACEC boundary then follows the 100 year flood boundary in a generally easterly direction including all of Bourne Pond, Bog Pond, Caleb Pond, parts of the Quashnet River and Red Brook and all of Witch Pond, Fells Pond, and Jehu Pond. At the point of the fifth intersection of the 100 year flood boundary with Great Oak Road, the ACEC boundary extends west on the northern side line of Great Oak Road across the 10 foot contour line (datum: mean sea level) to the second intersection with the 10 foot contour line (MSL). The ACEC boundary extends from this point in a northwesterly direction along the 10 foot contour line (MSL) to the point closest to the eastern shore (MLW) of the Great River. From this point the line extends by the shortest distance to the eastern shore (MLW) of the Great River. The boundary then extends in a northerly direction along the eastern shore (MLW) of the Great River to the western most point of the entrance channel to Jehu Pond. The boundary then extends due west to the MLW line on the west side of Great River and following the MLW line northward to the boundary between Monomoscoy Island and the adjacent northerly salt marsh. The boundary follows a northwesterly trend along the southern edge of this salt marsh, crosses Monomoscoy Road, and continues along the southern edge of this salt marsh to the intersection with the MLW line on the eastern side of Hamblin Pond. The boundary continues in a southerly direction along the MLW line on the east side of Hamblin Pond, across the northern channel entrance of the Little River and continues along the MLW line on the northern edge of Seconsett Island to the intersection of the MLW line and the town boundary between Falmouth and Mashpee. The ACEC boundary follows the town boundary to the intersection with the MLW line on the eastern shore of Waquoit Bay. The ACEC boundary extends from this point in a southerly direction along the MLW line, around Seconsett Island and then in a northerly direction to the point of intersection (Point A) with a true azimuth bearing line of 290°, drawn from the point (Point B) along the MLW line on the eastern shore of the Great River which is also the northernmost point (Point B) of property along the MLW line on the eastern shore of the Great River as described in the Plan of Land, South Cape Beach, Mashpee, Mass., prepared for the Department of Environmental Management, Scale 1"=200', February 16, 1976, Briggs Engineering and Testing Co., Inc., Norwell, Mass., as revised March 31, 1976. The ACEC boundary then proceeds southeasterly from Point A along the previously described true azimuth bearing line of 290° to Point B and continues in an easterly direction along the northern boundary line of said Plan of Land for South Cape Beach to the intersection with the southern side line of Wills Work Road. The ACEC boundary follows the southerly side line of said Road to the intersection with Great Oak Road and then follows the southerly side line of Great Oak Road to the intersection with 100 year flood boundary. The ACEC boundary follows the 100 year flood boundary in a northeasterly direction to the intersection of the southerly side line of Great Oak Road. The ACEC boundary then follows the southerly side line of said Road to the next intersection with the 100 year flood boundary. From this point, the ACEC boundary follows the 100 year flood boundary in a southerly direction to the southernmost extent of the 100 year flood boundary in Mashpee. The boundary then extends due south in a straight line to the MLW line of Vineyard Sount and thence in a westerly direction along the MLW line along South Cape Beach to the point of origin.

Also included within the ACEC boundary is the land along the upper reaches of the Child's River. The ACEC boundary begins at the intersection of the northerly side line of Rt. 28 and the 100 year flood boundary on the eastern side of the Childs River. The ACEC boundary proceeds northerly along the 100 year flood boundary on the eastern side of the Childs River to the point where the 100 year flood boundary crosses in a westerly direction the Childs River. The ACEC boundary then follows the 100 year flood boundary on the western side of the Childs River in a southerly direction to the point of intersection with the northern side line of Rt. 28. The ACEC boundary then proceeds from this point in an easterly direction across the Childs River to the point of origin.

Within the boundary the following exclusions exist:

1) The existing Waquoit Bay navigational channel (6 foot depth, Mean Low Water) extending in a northerly direction from the entrance jetties of Waquoit Bay to the head of Waquoit Bay. Specifically, this measn the channel delineated by existing U.S. Coast Guard buoys (See National Oceanic and Atmospheric Administration, nautical chart #13229, 15th Ad., February 3, 1979, page C, Waquoit Bay and U.S. Coast Guard navigational buoys). Where the channel is unmarked by buoys, the west channel boundary will be delineated by a straight line drawn from buoy C-7 northerly to the western edge of Bourne Pond. This channel would extend no further than 100 feet to the east of the west channel boundary and not exceed a dredged depth of 6 feet below mean low water. This channel will extend no further north than the present Falmouth town landing (near Seapit Road).

2) The existing Seconsett navigational channel extending from U.S. Coast Guard buoy N-6 (see NOAA nautical chart #13229, 15th Ad., February 3, 1979, page C, Waquoit Bay and U.S. Coast Coast navigational buoys) to the entrance of the Great and Little Rivers, Mashpee. The southern boundary of the Seconsett channel extends from buoy N-6, southeasterly in a direct line not to extend beyond Seconsett point. The width of the Seconsett channel will not exceed 100 feet from the southern boundary line. The Seconsett channel will not exceed a dredged depth of 6 feet below MLW.

3) The existing small culvert beneath Monomoscoy Road, Mashpee.

II. Designation of the Resources of Waquoit Bay

Waquoit Bay area is an extensive and largely unaltered resource system. Among the natural components of the system are many specified as Significant Resource Areas (SRA's) in the Massachusetts CZM Program. These include a long barrier beach system, dunes and sandy beaches, many acres of salt marsh, productive shellfish beds, a large estuary, anadromous fish runs and floodplain, erosion and accretion areas. The area is a spawning and nursery ground for many marine species, as well as an important habitat for upland species and waterfowl. The beaches, dunes, and salt marshes provide protection against storms for low-lying inland areas. The region clearly meets the regulatory criterion of the ACEC Program, that a region proposed for designation must contain at least five of the specified Significant Resource Areas.

III. Procedures Leading to ACEC Designation

The Waquoit Bay Area was first proposed for ACEC consideration by local citizens at a CZM planning meeting over two years ago. Active planning commenced in March 1979. Meetings on May 3, May 24, and August 2 were held in Falmouth and Mashpee and attended by local officials and local planning boards, committee members, owners of the area's three marinas and some property owners.

On August 2 a proposed boundary was unanimously endorsed by the six officials and marina owners present at this meeting. On July 9, 1979, a letter nominating the Waquoit Bay Estuarine System as an Area of Critical Enviornmental Concern was submitted by the Selectmen, Conservation Commission and Waterways Committee/ Harbormaster of the Towns of Falmouth and Mashpee. After reviewing this nomination, the Secretary of Environmental Affairs decided, on August 21, 1979 to proceed with a full review of the proposed area.

Notice of the receipt of the nomination request and a public hearing notice were published in the Environmental Monitor on August 22, 1979. The public hearing notice also appeared in two local newspapers: The Cape Cod Times and The Falmouth Enterprise. Additional information on the region was collected by the Coastal Zone Management office staff in consultation with local officials, town boards and natural resource officers. The results of this research were forwarded for comment and review to the Selectmen, Conservation Commissions, Planning Boards, Waterways Committee, and Natural Resource Officers and members of the CZM Citizen Advisory Council for Cape Cod. Copies also went to interested individuals and were available to the general public upon request. Informational articles about the proposed nomination appeared in the local newspaper. A final informational meeting was held at Mashpee Town Hall on August 30, 1979.

A public hearing was conducted on September 27, 1979 in the Falmouth Town Hall. The recorded testimony was largely favorable and an informal vote was 50-3 in favor of the designation. As the result of a number of concerns raised at this meeting, on-site visits were also arranged. On October 19, eighteen citizens and officials toured Waquoit Bay by boat following existing main navigational channels. In addition, CZM staff conducted site visits with individual landowners who had concerns.

A second public hearing was scheduled for October 25, 1979. A public hearing notice was published in the Environmental Monitor on October 22, 1979. The public hearing notice also appeared in the Cape Cod Times and The Falmouth Enterprise.

The hearing record remained open until November 7, 1979 for those persons who wished to submit written comments. After careful consideration of all public comments, final boundary modifications were defined.

IV. Discussion of Factors Specified in Section 6.48 of the CZM Program Regulations

Prior to designation of a region as an Area of Critical Environmental Concern, the Secretary must consider the factors specified in Section 6.48 of the CZM Program regulations. Based on research and information from local residents, I find that the following factors are applicable to the Waquoit Bay Barrier Beach System.

Quality of Natural Characteristics: This estuarine system is a relatively large unaltered physical and biological resource. Its unpolluted water attracts a wide range of finfish species and nurtures large numbers of shellfish. The undeveloped stretches of Washburn Island and Dead Neck accommodate contiguous environments of beach, dune, marsh, and low wooded hills. Minimum alteration of the natural features of this area will allow them to function at their maximum capacity. These undeveloped expanses also contribute significantly to the scenic beauty enjoyed by users of the area.

Public Health: The high water quality currently existing supports many important activities, including swimming, boating, fishing and shellfishing. Clean water must be maintained to ensure the safety of the recreational users of the area. Activities that would degrade water quality would have both environmental and economic consequences. The barrier beach formed by Washburn Island and Dead Neck acts as a natural storm buffer to protect the property of shore dwellers within the system. Development of this barrier would impair its natural form and protective function.

Uniqueness: An estuary, where fresh water inflow meets and mixes with salt water, is the most significant of all coastal features in the amount and variety of biological production. The largely unaltered Waquoit Bay estuarine system makes this area both a highly significant and uncommon feature of the Massachusetts coast. The availability of nutrients supports a great number and variety of species. These conditions provide excellent opportunities for scientific research. In a study conducted in the late 1960's, the Massachusetts Division of Marine Fisheries determined that of nine sample estuaries in the state, Waquoit Bay supported the greatest diversity of estuarine-associated fin-fish. Currently, a biologist from the Woods Hole Oceanographic Institution is studying the genetics and distribution of quahogs in the estuary.

Productivity: The region contains diverse and viable populations of fish, shellfish and waterfowl. The biological productivity of this area is sustained by its ponds and salt marshes which contribute large quantities of nutrients to the coastal food chain.

Imminence of Threat to the Resource: Alterations which could severely impact the natural functions or reduce productivity of the components of the Waquoit Bay system have been considered for the area. The ACEC designation would focus attention on the area's significant environmental and economic resources, and would serve as a guide regarding future activity in the area.

Irreversibility of Impact: Because the estuary has only limited access to the open Sound through the narrow cuts at the east end of Washburn Island, the entire basin is susceptible to inadequate flushing. The discharge of pollutants into this system would tend to remain concentrated rather than to disperse. As a result, impacts on shellfish and finfish could be severe, thereby damaging an important economic resource of the Waquoit basin. Other habitat alterations such as filling or removal could also severely affect sensitive spawning or nursery areas, thereby decreasing the abundance of valuable commercial, recreational, and aesthetic resources.

Economic Benefits: This ACEC brings significant income to Falmouth and Mashpee through tourists and area residents who purchase shellfish permits, the use of area services such as boatyards, and the wholesale trade in shellfish. Any alteration in the area that threatens to disrupt its utilization and/or attractiveness carries a potentially detrimental economic impact. Damage to the groundwater is also an important consideration because the shoredwellers depend on private groundwells for their fresh water supply.

Supporting Factors: Residents, business persons and other users of the ACEC agree that the area carries environmental importance, economic utility and aesthetic qualities. Groups at many levels, including local residents, town authorities and state administrative agencies, have voiced their concern about the need to preserve the undeveloped portions, particularly Washburn Island and South Cape Beach.

John A. Bewick
Secretary of Environmental Affairs

11/26/79
Date

APPENDIX 4

Massachusetts Notice of Intent to Prepare DEIS and DMP; Published in State Environmental Monitor on May 8, 1984, and Notice of Pre-Acquisition Planning Activities Published in State Environmental Monitor on November 23, 1981

Massachusetts Coastal Zone Management Office

The Massachusetts Coastal Zone Management Office (MCZM) will be working with the Sanctuaries Office of the U.S. Office of Ocean and Coastal Resources Management to develop a Draft Environmental Impact Statement (DEIS) for the possible designation of Waquoit Bay and some adjacent uplands in Falmouth and Mashpee as a federal Estuarine Sanctuary. Preacquisition Planning and Feasability Study activities were reviewed under EOEA #4256, noticed in the Monitor of 23 November 1981. On 23 December 1981, the Secretary of Environmental Affairs found that these planning activities did not require an Environmental Impact Report under MEPA.

Notice of the availability of the DEIS for review, when completed, will be published in the Monitor.

At this point MCZM is soliciting public comments for the scope of activities and impacts to be covered in the DEIS. Written comments should be forwarded to the MCZM Office, attention Steve Bliven, within 21 days of this notice. Additional information on the project may be obtained from Mr. Bliven at 727-9530.

100 Cambridge Street, Boston, MA 02202 (617) 727-9530

APPENDIX A
COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

ENVIRONMENTAL NOTIFICATION FORM

I. SUMMARY

A. Project Identification

1. Project Name Waquoit Bay Estuarine Sanctuary Preacquisition Planning and Feasibility Study
2. Project Proponent Mass. Coastal Zone Management office
   Address 100 Cambridge Street, Boston, MA 02202

B. Project Description: (City/Town(s) Falmouth, Mashpee

1. Location within city/town or street address Waquoit Bay vicinity (for further site details see below and attached map)
2. Est. Commencement Date: 1 January 1982 Est. Completion Date: 30 October 1982
   Approx. Cost $ 56,780 Current Status of Project Design: 0 % Complete

C. Narrative Summary of Project

Describe project and give a description of the general project boundaries and the present use of the project area. (If necessary, use back of this page to complete summary).

The proposed project involves a planning and feasibility study for the designation of a National Estuarine Sanctuary within the Waquoit Bay areas of Falmouth and Mashpee. Work will include planning only; a MEPA filing is required because the site is included in the designated Waquoit Bay Area of Critical Environmental Concern (ACEC). An additional MEPA filing will be required prior to any implementation of any Sanctuary plans.

The National Estuarine Sanctuary program allows states to acquire, develop or operate estuaries to be set aside "to serve as natural field laboratories in which to study and gather data on the natural and human processes occurring within the estuaries of the coastal zone". Such data will be used in making management decisions in coastal areas. Multiple uses can take place in the sanctuary as long as the activities do not detract from research and educational uses.

The planning activities will assess feasibility and major issues and concerns in such a designation; refine boundary proposals; develop management plans and/or programs for research and education; investigate acquisition techniques (either in fee or through restrictions); and do real estate appraisals. This information will be used for future public consideration of a potential sanctuary designation.

The area to be initially reviewed generally corresponds to the Waquoit Bay ACEC and includes Waquoit Bay, South Cape Beach, Washburn Island and the marshlands around Hamlin, Jehu, Flat and Sage Lot Ponds. A map is included with this filing.

Copies of this may be obtained from:
Name: Steve Bliven Firm/Agency: Mass. Coastal Zone Management
Address: 100 Cambridge Street, Boston, MA 02202 Phone No. (617)-727-9530

79 THIS IS AN IMPORTANT NOTICE. COMMENT PERIOD IS LIMITED.

LEGAL NOTICE

NOTICE OF INTENT TO SUBMIT ENVIRONMENTAL NOTIFICATION FORM

The Massachusetts Coastal Zone Management (CZM) office hereby gives notice that on 13 November 1981 an Environmental Notification Form (ENF) was submitted to the Secretary of Environmental Affairs under the provisions of MEPA, MGL. Ch. 30 ss. 62-62H inclusive, for a feasibility study and the preacquisition planning period of a possible National Estuarine Sanctuary designation for the Waquoit Bay vicinity in Falmouth and Mashpee. Copies of this ENF will be available from Steve Bliven, CZM, 100 Cambridge Street, Boston, MA 02202. This ENF will be available for public inspection during business hours at the MEPA Unit, Executive Office of Environmental Affairs, 100 Cambridge Street, Boston, MA 02202 and also at the office of the Falmouth Town Clerk, Town Building, rear of 173 Main Street in Falmouth and at the office of the Mashpee Town Clerk, Great Neck Road in Mashpee.

Public notice of the filing of this ENF will be published by the Secretary of Environmental Affairs in the Environmental Monitor. A twenty day period for submission of public comments will follow the publication of notice in the Monitor. Please write or call the MEPA Unit at 727-5830 for information on public comment periods and how to subscribe to the Monitor.

Steve Bliven
Mass. Coastal Zone Management

APPENDIX 5

Excerpt from the Washburn Island Preliminary Management Plan of April 1983 - "Conservation and Recreational Uses" (Massachusetts Department of Environmental Management)

Conservation & Recreational Uses

CARRYING CAPACITY

The Relative Carrying Capacity Map measures the ability of the island's natural environment to absorb future recreational use without being damaged. Some areas on Washburn Island have a high capacity to absorb future recreational activity while others would be severely impacted by only a slight increase in use. A sound master plan for the island's future should be based on a good understanding of the site's carrying capacity in order to assign future activities to the most appropriate locations.

Certain portions of the dense pitch pine forests in the island's interior appear to be most tolerant and amenable to recreational use. These areas have been given a "high" carrying capacity rating on the map. Though fire danger is a problem in these areas, the pitch pine forests with hardy grass and shrub understory could support carefully planned passive recreation without significantly losing their present quality. Some possible future improvements include a comfort station, dispersed camping areas and pedestrian trails. These uses would be screened by the dense, absorptive pine forest, which is more resistant to erosion and visual degradation than the more open areas on the island. The high carrying capacity areas within the pine forests are also well above dangerous flood and velocity zones, and are located away from the important visual and envi-

ronmental zones located earlier in this report. This zone of high carrying capacity would logically be the center of future development use of the island. Areas of "moderately high" carrying capacity generally occur in the pitch pine forests as well, though these zones contain a more fragile and scenic herb understory. Past fires have often occurred in this portion of the forest, so particular care should be taken here to avoid fire hazards. The moderately high carrying capacity zone could support hiking, nature study, some carefully controlled camping, and perhaps a few well-sited structures. Future users of the island could be encouraged to travel from their arrival in the high carrying capacity zone through this moderately high carrying capacity zone on their way to the more fragile areas of Washburn Island. In this manner, intensity of use would be gradually dispersed from the durable central upland portions of the island to the sensitive barrier beaches and marshes to the south. This would result in only limited, dispersed use of fragile outlying zones such as the dunes and salt marshes, while high capacity areas would become the focus of major trails and activities.

The "moderate" carrying capacity zone, generally covering the northern and central shores of the island, could support carefully controlled seasonal uses such as bathing, hiking trails and nature study areas. More intensive development would be prohibited here, though the arrival dock would of necessity be located at some point along the shore. The weakest link in the ability of this zone to absorb future uses consists of the highly erodable coastal banks and fringing salt marshes. Pedestrian traffic in these areas will have to be confined to established trails and, where necessary, to constructed stairs and boardwalks.

The "low-moderate" carrying capacity zone, located primarily in the southern portion of the island, consists of fragile dune and salt marsh vegetation presently preserved in wild, untouched expanses of seashore. Excessive use of this zone, possible with even a few as three hundred visitors a day, could drastically alter the primitive and untrammelled quality of this area. Access to this area by large groups of people should therefore not be actively encouraged. Major access points to the island should be located well away from this zone, and pedestrian paths leading to it should be carefully designed to keep visitors away from the most critically sensitive areas. Strict and enforcable criteria for future use should be prepared in order to allow for its future enjoyment by as many people as it will reasonably support. This open, treeless area is especially vulnerable to visual intrusions.

Finally, areas of "low" carrying capacity - primarily the salt marshes - should be restricted from most future uses. These areas can support only occasional pedestrian access. Sustained traffic in the marshes would quickly result in the death of salt marsh grasses and the rapid erosion of the soft, peaty soils. The flat, open salt marshes are the most visually sensitive zones on the island.

THE MASTER PLAN

The Preliminary Master Plan for Washburn Island directly responds to the implications in the Regional Context and Site Analysis portions of this report. The Waquoit Bay area is becoming increasingly developed, especially the land directly on the coast. Reserving Washburn Island for recreation and conservation is fundamental in helping to preserve the region's environmental vitality and marine resource values.

This report recommends that Washburn Island be allowed to remain largely in its present state. Minor improvements will allow the island to absorb limited recreational use by local residents and a limited number of visitors. Proposed uses have been carefully planned to respect the island's natural resources and physical carrying capacity. Priority has been placed on maintaining the current environmental and visual quality, rather than accomodating large numbers of visitors.

The property should be managed in conjunction with South Cape Beach across the Bay. South Cape Beach provides a beach front park with easy access by car, and will be designed to accomodate parking for up to 400 vehicles. Washburn Island, on the other hand, will be managed for more limited use, primarily passive recreation such as hiking, nature study, etc. Access to the island will be by private boat from So. Cape Beach. Wooden docks on the east and west side of the island would be built to accommodate boat traffic to the site. Here, a small interpretive display of maps and information will greet the visitor, and from here trails lead out to the north and south portions of the island. A few private boats could also be allowed to dock. From the beach, access up the side of the island would be through an area previously graded by the military.

Possible tent camping is located in the plan on the island's eastern side. This location is accessible to the landing point while being isolated from the development to the west, and is on a more durable portion of the land. The main comfort station is located between the camping area and the main access point. The desireability of allowing limited camping on the site will have to be looked into carefully before making a final decision.

The proposed trail system utilizes the old main road as the western north-south trail. Cross trails are provided to a similar trail along the east side of the island through the upland forests. The system is layed out to minimize impact and yet bring visitors into contact with a variety of landscapes. People will be directed by the trails to cross the zones of low carrying capacity around the main salt marsh to the south by using either the western old-road route, or hard sand and a raised boardwalk on the eastern side of the marsh.

A few overlook structures are carefully located to take advantage of good views and interpretive features. Unsupervised swimming will be allowed on the major south-facing beach, and fishing can take place at the mouth of Eel Pond and Waquoit Bay. A carry on/carry off trash policy would be in effect.

Least Terns have been observed nesting on the barrier beach in the southern portion of Washburn Island. In order to protect this significant island resident, portions of the beach should be closed during the mid-summer nesting season. Boardwalk design and location should facilitate this protective management activity.

PARK MANAGEMENT

If Washburn Island is acquired by DEM in the near future, the Department proposes to staff the island with volunteer "island managers" during the summer season of 1983. The island manager system, used successfully for several years in the Boston Harbor Islands, allows environmental interns to staff an

island 24 hours a day, providing guidance, maintenance and site supervision around the clock. The island managers, usually college students majoring in environmental or recreation fields, would be supervised by full-time DEM staff based at South Cape Beach State Park.

Permanent staffing of Washburn Island would begin in the summer of 1984. Estimated permanent staff would include one seasonal park supervisor, two seasonal interpreters and two seasonal skilled conservation helpers. These positions would be filled during the peak season (May through September) with wintertime supervision provided by full-time staff based at South Cape Beach.

SUMMARY

Washburn Island is a property of unique environmental, scenic and recreational value. Its protection from rapidly increasing development pressures is of major concern to the Commonwealth of Massachusetts.

This report has described Washburn Island's resources in detail, and has proposed preliminary plans for the preservation of the island. Because environmental protection is the primary concern, control of visitor access to, and use of, the island is of key importance. The Washburn Island master plan has accommodated this need to maintain remoteness and to minimize disturbance of the site while providing for a certain amount of controlled public access. Visitor numbers on the island will be regulated by the low volume of boat traffic reaching the site from the mainland. Access to the island will be encouraged at the designated landings in the central portion of the site, so the more fragile southern portions will receive proportion-

ately fewer users. Structures and associated development will be limited and inconspicuously sited. An emphasis will be placed instead on the interpretation and enjoyment of a natural, remote and undisturbed environment, cluttered with as few buildings as possible.

Since Washburn Island's abandonment by the military at the end of World War II, natural processes have been working to reclaim the landscape. This report proposes a master plan and management policy for the site that will encourage this process of natural reclamation to continue. The island, now an invaluable assett, will continue to appreciate in scenic, environmental and recreational value in future years if given the opportunity.

DATE DUE

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