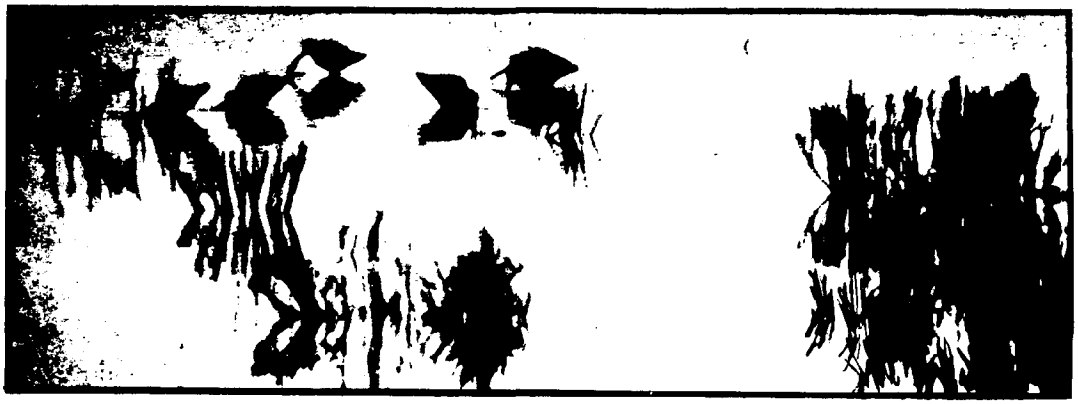
DRAFT ENVIRONMENTAL IMPACT STATEMENT

NARRAGANSETT BAY ESTUARINE SANCTUARY

Proposed Estuarine Sanctuary Grant Award for a Narragansett Bay Estuarine Sanctuary in the State of Rhode Island



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Coastal Zone Management
and
STATE OF RHODE ISLAND
ıartment of Environmental Management

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1980

A PUBLIC HEARING WILL BE HELD

on this Draft Environmental Impact Statement and the proposed Narragansett Bay Estuarine Sanctuary on:

Wednesday, June 25, 1980, at 7:30 p.m.

Portsmouth Town Hall
Planning Board Room
2200 East Main Road
Portsmouth
Rhode Island 02871

Comments or presentations will be scheduled on a first-come, first-heard basis, and may be limited to a maximum of five minutes. No verbatim transcript of the hearing will be prepared, but the hearing staff will record and summarize the comments. All comments received at the hearing will be considered in the preparation of the Final Environmental Impact Statement.

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

May 16, 1980

Dear Reviewer:

In accordance with the provisions of Section 102(2)(C) of the National Environmental Policy Act of 1969, we are enclosing for your review and consideration the draft environmental impact statement prepared by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, Department of Commerce, on the proposed Narragansett Bay Estuarine Sanctuary.

Any written comments or questions you may have should be submitted to the contact person identified below by July 7, 1980. Also, one copy of your comments should be sent to me in Room 3425, U.S. Department of Commerce, Washington, D.C. 20230.

CONTACT PERSON

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D. C. 20235
Telephone: 202/634-4236

Thank you for your cooperation in this matter.

Sincerely,

Bruce R. Barrett

Bruce Barrett
Acting Director
Office of Environmental Affairs

Enclosures

US Department of Commerce
NOAA Coastal Services Center Library
2234 South Hobson Avenue
Charleston, SC 29405-2413

UNITED STATES

DEPARTMENT OF COMMERCE

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PROPOSED

ESTUARINE SANCTUARY GRANT AWARD

FOR

A NARRAGANSETT BAY ESTUARINE SANCTUARY

NEWPORT COUNTY, RHODE ISLAND

TO THE

STATE OF RHODE ISLAND

TD194.56.R42N37 1980

Prepared by:

U.S. Department of Commerce
Office of Coastal Zone Management
National Oceanic and Atmospheric
Administration
3300 Whitehaven Street,N.W.
Washington, D.C. 20235

and

State of Rhode Island
Department of Environmental
Management
83 Park Street
Providence, Rhode Island 02903

May 1980

DESIGNATION: DRAFT ENVIRONMENTAL IMPACT STATEMENT

TITLE: PROPOSED ESTUARINE SANCTUARY GRANT AWARD FOR A NARRAGANSETT BAY ESTUARINE SANCTUARY, NEWPORT COUNTY, RHODE ISLAND, TO THE STATE OF RHODE ISLAND

ABSTRACT: The State of Rhode Island has submitted an application for a grant from the Office of Coastal Zone Management to establish an estuarine sanctuary in Narragansett Bay, Rhode Island. The proposed sanctuary would consist of Hope Island, Patience Island, and the northern end of Prudence Island, and their surrounding waters for a total of 2,629 acres of land and water.

Approval of this grant application would permit the establishment of an estuarine sanctuary representing the Virginian biogeographic region. The proposed sanctuary would be used primarily for research and educational purposes, especially to provide information useful for coastal zone management decision-making. Recreational uses would be encouraged to the extent that they are compatible with the proposed sanctuary's research and educational programs.

Research and monitoring in and near the proposed sanctuary would provide baseline information against which the impacts of human activities elsewhere in Narragansett Bay and the Virginian biogeographic region could be assessed.

APPLICANT: RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

LEAD AGENCY: U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
OFFICE OF COASTAL ZONE MANAGEMENT

CONTACT: Mr. Frank D. Christhilf
Estuarine Sanctuary Project Manager
Office of Coastal Zone Management
3300 Whitehaven Street, NW
Washington D.C. 20235 (202) 634-4236

Individuals receiving copies of the Draft Environmental Impact Statement will NOT automatically receive copies of the Final Environmental Impact Statement unless specifically requested, or unless they submit comments on the Draft Environmental Impact Statement.

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SUMMARY

BACKGROUND

Section 315 of the Coastal Zone Management Act of 1972 (P.L. 92-583) established the Estuarine Sanctuary Program, which provides grants on a matching basis to States to acquire, develop, and operate estuarine areas to be set aside as natural field laboratories. These areas are to be used primarily for long-term scientific and educational programs that will provide information essential to coastal management decisionmaking.

Uses of estuarine sanctuaries are intended to serve objectives such as the following:

- -- To gain a more thorough understanding of ecological relationships within the estuarine environment;
- -- To make baseline ecological measurements;
- -- To serve as a natural control in order to monitor changes and assess the impacts of human stresses on the ecosystem;
- -- To provide a vehicle for increasing public knowledge and awareness of the complex nature of estuarine ecosystems, their values and benefits to man and nature, and the problems confronting them; and
- -- To encourage multiple use of the estuarine sanctuaries to the extent that such usage is compatible with the primary sanctuary purposes of research and education.

To ensure that the Estuarine Sanctuary Program includes sites that adequately represent regional and ecological differences, the program regulations established a biogeographical classification scheme that reflects geographic, hydrographic, and biological characteristics. Eleven (11) biogeographic categories are defined in the program regulations. Subcategories of this basic system will be developed and utilized as appropriate to distinguish different subclasses of each category. It is anticipated that at least 22 sanctuaries will be needed to provide adequate representation of the various estuarine ecosystems occurring within the United States.

The Estuarine Sanctuary Program regulations, first published in 1974, were amended in 1977 to authorize three kinds of 50% matching grants: (1) an optional initial grant for such preliminary purposes as surveying, appraising, and assessing the lands to be acquired, and for developing management, research, and education plans; (2) grants for acquisition of the

real property within the sanctuary boundaries; and (3) operational grants for administration of the established sanctuary.

Rhode Island's Department of Environmental Management (DEM), on behalf of the State, submitted a grant application to the National Oceanic and Atmospheric Administration's (NOAA's) Office of Coastal Zone Management (OCZM) in January, 1980 to gather information directed toward establishment of an estuarine sanctuary consisting of Hope and Patience Islands, the northern end of Prudence Island, and their adjacent waters in Narragansett Bay, Rhode Island. The proposed sanctuary would represent the Virginian biogeographic region. The three island sites are among the largest remaining undisturbed areas in the Bay, and would be accessible to large numbers of people for research and educational purposes.

NOAA awarded a preacquisition grant of $10,654, matched by an equivalent amount from the State, on March 10, 1980. This grant enabled DEM to proceed with development of a formal grant application which, if approved, would provide funds for the acquisition of lands for the sanctuary. Should the proposed sanctuary be established, Rhode Island would be eligible for $50,000 annual grants (also matched) for sanctuary management and operations.

PROPOSED ACTION

The grant request to NOAA for $335,000, matched by the State, would be used for the fee simple acquisition of 203 acres of uplands and wetlands on Patience Island from The Nature Conservancy, its present owner. The State already owns fee simple title to Hope Island and the northern end of Prudence Island, the other land areas proposed for inclusion within this estuarine sanctuary. The composition of real property within the proposed sanctuary is as follows:

Identification	Size in Acres
Patience (207 acres):	
-- The Nature Conservancy.....	203
-- Other private ownership.....	4
North Prudence (737 acres):	
-- State-owned.....	703
-- Private ownership.....	34
Hope Island (94 acres):	
-- State-owned.....	94
Adjoining State-Owned Waters to 18' Isobath.....	1,591
Total Land and Water Within Sanctuary:	2,629 acres

Rhode Island would not exercise its power of eminent domain (condemnation) to acquire Patience Island, but would instead negotiate a voluntary sale. The State would be willing to consider acquiring fee simple title or conservation easements to the privately owned lands on Patience or central and northern Prudence Islands, but only on a willing-seller basis.

MANAGEMENT

The proposed sanctuary would be managed by Rhode Island's Department of Environmental Management as part of the [Narragansett] Bay Islands Park system, which includes other sites within Narragansett Bay (See Fig. 3). The objectives of the Estuarine Sanctuary Program and the Bay Islands Park system are generally compatible, and the management policies proposed by DEM for the sanctuary would ensure its preservation and use in a manner consistent with the purposes and regulations of the Estuarine Sanctuary Program.

DEM would be assisted in its administration of the proposed sanctuary by a Sanctuary Advisory Committee (SAC), comprising representatives of the scientific research community, the educational community, Rhode Island's Coastal Resources Management Council, NOAA, Prudence and Portsmouth residents, principal user groups, and conservation organizations. Federal agencies with programs that might affect the proposed sanctuary -- such as the Environmental Protection Agency, the Navy, the U.S. Fish and Wildlife Service, and the Army Corps of Engineers -- may also be represented on the SAC.

Current uses of the proposed sanctuary lands and waters include hunting of deer, small game, and ducks; commercial and recreational shellfishing; and recreational fishing and boating. These uses would be permitted to continue as long as they remain at levels that do not threaten the integrity of the proposed sanctuary, or jeopardize use of the sanctuary for research or educational purposes. DEM would monitor activities within the sanctuary, and might in the future restrict, prohibit, relocate, or otherwise control uses or levels of use as needed to protect the sanctuary's natural resources.

RESEARCH

The proposed sanctuary would provide excellent sites for estuarine research in Narragansett Bay. Research opportunities within the proposed sanctuary would generally fall into three categories: (1) research, analysis, and interpretation of the upland, intertidal, and benthic components of the Narragansett Bay estuary; (2) continuation of ongoing sampling and monitoring programs within the Bay; and (3) research on the impacts of pollutants on estuarine organisms. Prudence and Patience Islands lie near the transition zone between the comparatively polluted waters of the Upper Bay and the cleaner waters of the rest of the Bay, so that research and monitoring in and around the proposed sanctuary could provide valuable baseline information

against which the impacts of human activities on estuarine habitat and dynamics throughout the Bay could be compared.

EDUCATION

The proposed sanctuary is well suited for educational uses. The sanctuary islands are centrally located in Narragansett Bay, within easy ferry reach of Rhode Island's population centers. An estimated 600,000 people live within 10 miles of the three islands. Patience and Prudence Islands are particularly suitable for educational use. They contain a variety of estuarine habitats within a small area, while their flora and fauna can tolerate properly supervised educational uses without incurring significant environmental damage. On these islands, educational activities will be encouraged through an extensive interpretative program, including printed materials, guided and self-guided tours, resident naturalists, etc.

Hope Island, in contrast, is not suitable for intensive educational programs, because it contains one of the largest wading bird rookeries in the Northeast. The nesting species -- including several kinds of egret, heron, and ibis -- are sensitive to disruption from human activities, particularly during the April 15-July 31 nesting season. For this reason, access to Hope Island for uses other than ornithological research will be restricted during this period. At other times of year, Hope Island would be accessible for supervised group tours.

RECREATION

The primary purpose of the National Estuarine Sanctuary Program is to provide long-term protection for representative, undisturbed estuarine areas, so that they may be used for scientific and educational activities. The program regulations, though, encourage multiple use of sanctuaries to the extent that such other uses are compatible with the primary sanctuary purpose. The capacity of each sanctuary to accommodate multiple uses, and the permissible kinds and levels of such uses, are determined separately for each sanctuary, and may vary considerably according to the nature of the sanctuary and its surroundings, the customary and historic uses of the sanctuary area, and such new uses as may be proposed. Low-intensity recreational activities -- such as fishing, shellfishing, hunting, boating, hiking, wildlife photography, etc.-- are generally considered compatible uses of sanctuary lands and waters. From time to time, however, it may become necessary to impose and enforce restrictions or prohibitions on one or more such uses within a sanctuary to preserve the sanctuary's value for research or educational purposes.

DEM would monitor all activities within the proposed sanctuary. If any activity or level of use threatens sanctuary resources, DEM would take appropriate steps to eliminate the threat. DEM has both the authority and the field personnel to enforce applicable regulations within the proposed sanctuary.

PART I: PURPOSE OF AND NEED FOR ACTION

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. This Act authorized a Federal grant-in-aid and assistance program to be administered by the Secretary of Commerce, who in turn delegated this responsibility to the Office of Coastal Zone Management (OCZM) 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. 308);

-- 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 to establish estuarine sanctuaries, or to provide for shorefront access or island preservation (Sec. 315).

Section 315 of the Act authorizes an Estuarine Sanctuary Program to provide matching grants to States to acquire, develop, and operate natural estuarine areas as sanctuaries, so that scientists and students may be provided the opportunity to examine the ecological relationships within the areas over time. Section 315 provides a maximum of $2 million in Federal funds, to be matched by an equivalent amount from the State, to acquire lands for each sanctuary. Regulations for implementation of the Estuarine Sanctuary Program were published in final form on June 4, 1974

[15 CFR Part 921, Federal Register 39 (108): 19922-19927], and amended on September 9, 1977 [15 CFR Part 921, Federal Register 42 (175): 45522-45523] (Appendix 1).

Estuarine sanctuaries have the dual purposes of (1) preserving relatively undisturbed areas so that a representative series of natural estuarine systems will always remain available for ecological research and education, and (2) ensuring the availability of natural areas for use as a control against which impacts of human activities in other areas can be assessed. These sanctuaries are to be used primarily for long-term scientific and educational purposes, especially to provide information useful to coastal zone management decision-making.

Research purposes may include:

-- Gaining a more complete understanding of the natural ecological relationships within the various estuarine environments of the United States;

-- Making baseline ecological measurements;

-- Serving as a natural control against which changes in other estuaries can be measured, and aiding in evaluation of the impacts of human activities on estuarine ecosystems; and

-- Providing a vehicle for increasing public knowledge and awareness of the complex nature of estuarine systems, their benefits to man and nature, and the problems confronting these ecosystems.

While the primary purposes of estuarine sanctuaries are scientific and educational, multiple use of estuarine sanctuaries by the general public will be encouraged to the extent that such usage is compatible with the primary sanctuary purposes. Such uses may generally include low-intensity recreation, such as boating, fishing, shellfishing, hunting, and wildlife photography or observation.

The Estuarine Sanctuary regulations envision that the Estuarine Sanctuary Program will ultimately represent the full variety of regional and ecological differences among the estuaries of the United States. The regulations state that "the purpose of the estuarine sanctuary program ... shall be accomplished by the establishment of a series of estuarine sanctuaries which will be designated so that at least one representative of each estuarine ecosystem will endure into the future for scientific and educational purposes" [15 CFR 921.3(a)]. As administered by OCZM, the Estuarine Sanctuary Program defined 11 different biogeographic regions based on geographic, hydrographic, and biological characteristics. Subcategories of this basic system will be established as appropriate to distinguish different subclasses of each biogeographic region. It is anticipated that at least 22 sanctuaries

will be needed to provide minimal representation for the Nation's estuarine ecosystems.

Since 1974, OCZM has awarded grants to establish seven estuarine sanctuaries. These include:

Sanctuary	Biogeographic Classification
South Slough Coos Bay, Oregon	Columbian
Duplin River Sapelo Island, Georgia	Carolinian
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

The proposed action under consideration by OCZM is a grant application from the State of Rhode Island to acquire land for an estuarine sanctuary consisting of approximately 2,629 acres of land and water in Narragansett Bay. The application requests $335,000 from NOAA, to be matched by an equivalent amount of State funds and privately donated lands, for the purchase of 203 acres of land on Patience Island. This proposed estuarine sanctuary would be representative of the Virginian biogeographic region.

Rhode Island's proposal follows several years of interest in and concern for the islands in the Narragansett Bay estuary by State and local officials, and university and conservation groups, following the closure of major Navy bases in the Bay during 1974-77. The three islands proposed to be included in the estuarine sanctuary -- Hope Island, Patience Island, and the northern end of Prudence Island -- were selected because they are essentially undisturbed, representative estuarine sites, and because they would be readily accessible to large numbers of people for research, education, and recreation purposes. On March 10, 1980, OCZM awarded Rhode

Island a $10,654 preacquisition grant for the proposed sanctuary, which enabled the State to complete an appraisal and environmental assessment of the islands, and to prepare management, research, education, and recreation plans.

PART II: ALTERNATIVES (INCLUDING PROPOSED ACTION)

A. Preferred Alternative

The State of Rhode Island has submitted an application for a grant of $335,000, to be matched by an equivalent amount of State funds and privately donated lands, for the acquisition of lands to establish an estuarine sanctuary in Narragansett Bay encompassing Hope and Patience Islands, the northern end of Prudence Island, and their surrounding waters (See Fig. 1). The proposed sanctuary would include 1,038 acres of land (of which 797 acres are now publicly owned), and 1,591 acres of adjoining waters (all owned by the State), and would be managed by Rhode Island's Department of Environmental Management.

1. Boundaries and Acquisition of Sanctuary Lands

The boundaries of an estuarine sanctuary "may include any part or all of an estuary, adjoining transitional areas, and adjacent uplands, constituting to the extent feasible a natural unit" (15 CFR 921.2). The proposed sanctuary lies within Narragansett Bay, an estuary 111,360 acres in size, with a watershed covering 1,183,360 acres in Rhode Island, Massachusetts, and Connecticut. It is not possible to acquire the entire Narragansett Bay estuary and its watershed, and in any case much of the land around the Bay is intensely developed, and used for purposes incompatible with an estuarine sanctuary.

Rhode Island has selected three islands in the Bay and their surrounding waters, which approximate a natural ecological unit. Specifically, the proposed sanctuary would consist of all of Hope Island (94 acres), all but 4 acres of Patience Island (203 of 207 acres), 703 out of 737 acres on the the northern end of Prudence Island, and the waters surrounding these island sites to a depth of 18' (1,521 acres), for a total of 2,629 acres of land and water (Fig. 2). Rhode Island already owns Hope Island and the northern end of Prudence Island, and proposes to purchase Patience Island from The Nature Conservancy, its current owner.

Acquisition would be performed in accordance with Federal regulations for real estate acquisition, including an independent appraisal and the offer of Fair Market Value. Acquisition would be through negotiation only, and Rhode Island would not use its powers of eminent domain (condemnation). Some lands within and adjacent to the proposed sanctuary would remain in private hands. The State would be willing to obtain fee simple title or conservation easements to some or all of these lands, depending on future funding, but only through willing-seller negotiations.

2. Management

a. Sanctuary as Part of Bay Islands Park System

Rhode Island proposes to include this estuarine sanctuary within its Bay Islands Park, and to manage the sanctuary as part of that system (Fig. 3). Rhode Island's goals in establishing this Park are (1) to protect some of the State's last remaining undeveloped island areas in Narragansett Bay, and (2) to provide opportunities for the public to enjoy and study these sites. To achieve these goals, Rhode Island has set the following guidelines:

-- the Bay Islands Park should serve a wide range of interests by providing diverse educational and recreational opportunities. Uses of these islands, however, must respect and harmonize with the natural environment. Many of the areas have been designated as significant or unique by a Rhode Island natural areas survey, and recreational use must respect their vulnerability.

-- types and levels of permitted recreational activity will be determined separately for each island, based on an assessment of its ability to support such uses without undue environmental damage or degradation. An environmental inventory of each site has been completed, and activities would be permitted only after an analysis of their potential environmental impact. Support facilities in the park and sanctuary would be kept to a minimum, and would be designed to be as unobstrusive as possible.

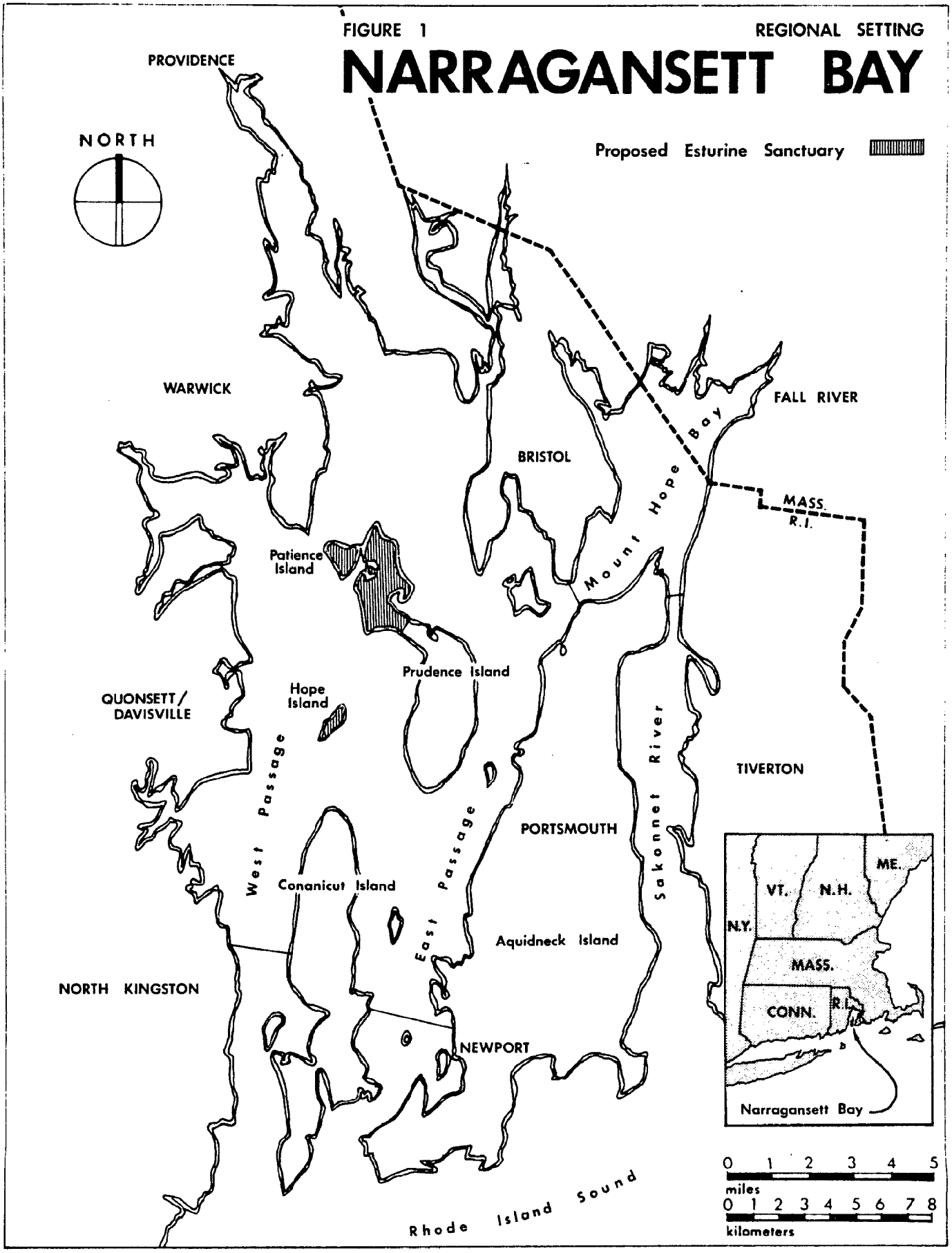
-- allowable activities and uses would be based on the existing conditions at each site. For example, the southern end of Prudence Island, which was used by the Navy as an ammunition depot and which has an excellent dock, road system, several buildings, and utilities, would become the park center and sanctuary headquarters. The existing buildings there would be recycled for park and sanctuary use. The sanctuary sites themselves -- Patience, northern Prudence, and Hope Islands -- would be protected, and would offer environmental interpretation programs to a limited and controlled number of visitors.

-- the opportunity to enjoy the Bay Islands Park should be available to everyone. Convenient, reliable, and inexpensive public transportation would therefore be provided to all park sites.

The Department of Environmental Management (DEM), the State's natural resources agency, would manage both the Bay Islands Park and the proposed estuarine sanctuary. To ensure protection and preservation of the estuarine sanctuary, DEM would permit only such uses and activities within the sanctuary as are compatible with the environmental capabilities of each island. DEM has the authority and the field personnel to enforce restrictions on types and levels of usage. DEM would also control access to and within the sanctuary sites, and would monitor and restrict access as needed to protect the sanctuary.

FIGURE 1 REGIONAL SETTING

NARRAGANSETT BAY



b. Administration

Rhode Island proposes to manage the estuarine sanctuary, together with the southern end of Prudence Island, as part of its Bay Islands Park system.

South Prudence, because of its durability and the facilities built there by the Navy, is a logical site for the Bay Islands Park center, and would be the most heavily used site within the Park system. Ferries would deliver people here from Providence, Newport, and North Kingston, and most of the Park system's facilities would be located here.

Public access to the sanctuary sites would be routed through South Prudence, with ferry service to Hope and Patience Islands, and shuttle bus service to northern Prudence. South Prudence would also house the estuarine sanctuary headquarters and visitor center, and would be the summer residence of the sanctuary manager.

All Sanctuary and Bay Islands Park personnel would be DEM employees. DEM operating divisions (Parks and Recreation, Fish and Wildlife, Enforcement, and Forestry) would submit annual work programs for the sanctuary and Park sites to DEM's Assistant Director for Operations, who would coordinate proposed actions and resolve conflicts.

1. Sanctuary Manager

Should this proposed sanctuary be established, DEM would hire a full-time sanctuary manager to administer the three island sites within the sanctuary, and also the South Prudence site. This manager would be required to have administrative experience in addition to training as both a resource manager and an interpretative education specialist, and would have the following duties on a year-round basis:

-- Administering the sanctuary, including the preparation of required State and Federal grant applications, proposals, budgets, and reports, and maintaining necessary records.

-- Advising and coordinating with government agencies on issues and projects related to or having an impact on the sanctuary.

-- Coordinating special studies and research activities within or related to the sanctuary, and interpreting and applying research results.

-- Supervising educational activities within the sanctuary.

-- Supervising and, as appropriate, participating in all activities or projects that might affect the sanctuary.

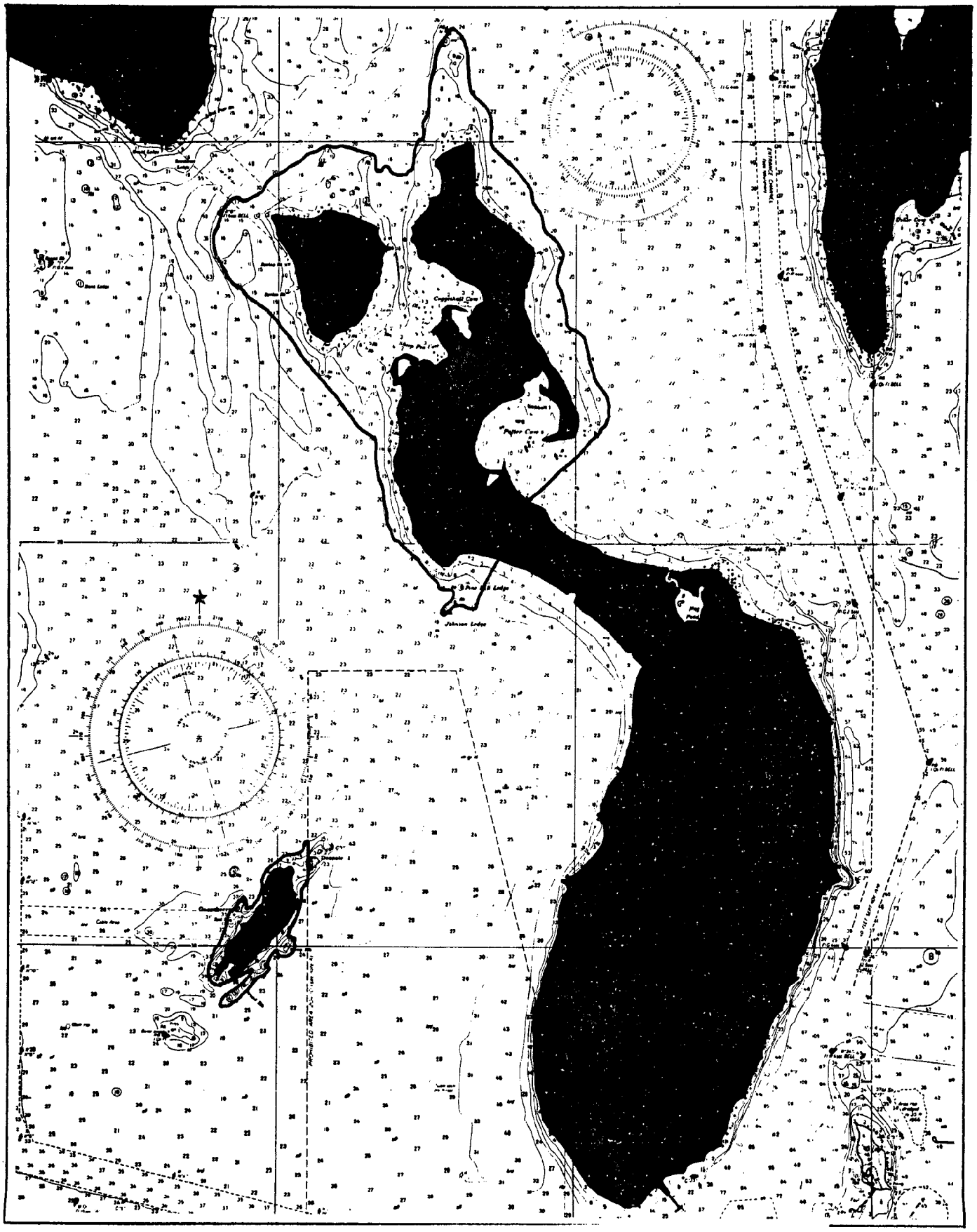


FIGURE 2

PROPOSED SANCTUARY BOUNDARIES

During the summer months, when the Park is in full operation, the sanctuary manager will also be park manager for the South Prudence site, and would supervise all activities within the sanctuary and Park sites.

DEM will hire several naturalists for the summer season only, to conduct guided tours and interpretative programs, and to assist in the supervision and general surveillance of activities within the sanctuary.

2. Sanctuary Advisory Committee

To achieve effective coordination and cooperation among the public and private groups participating in the sanctuary program, a Sanctuary Advisory Committee (SAC) would be created to assist and advise the DEM Director. The SAC would include representatives of the scientific research community, the educational community, DEM (including the Divisions of Fish and Wildlife, Parks and Recreation, and Coastal Resources), NOAA, the Coastal Resources Management Council, the Town of Portsmouth, Prudence Island residents, private user groups such as the Rhode Island Boating Council, commercial shellfishermen or others, and conservation organizations. Federal agencies with programs affecting the sanctuary -- such as the Army Corps of Engineers, the Navy, and the Environmental Protection Agency -- may be represented on the SAC also.

SAC functions would include:

-- Advising DEM on sanctuary administration. In this role, the SAC would assist DEM in developing guidelines for sanctuary management, as well as job qualifications for the sanctuary manager.

-- Reviewing proposals for research or educational activities within sanctuary lands and waters, and making appropriate recommendations to DEM.

-- Recommending special studies for archeological, cultural, or other purposes.

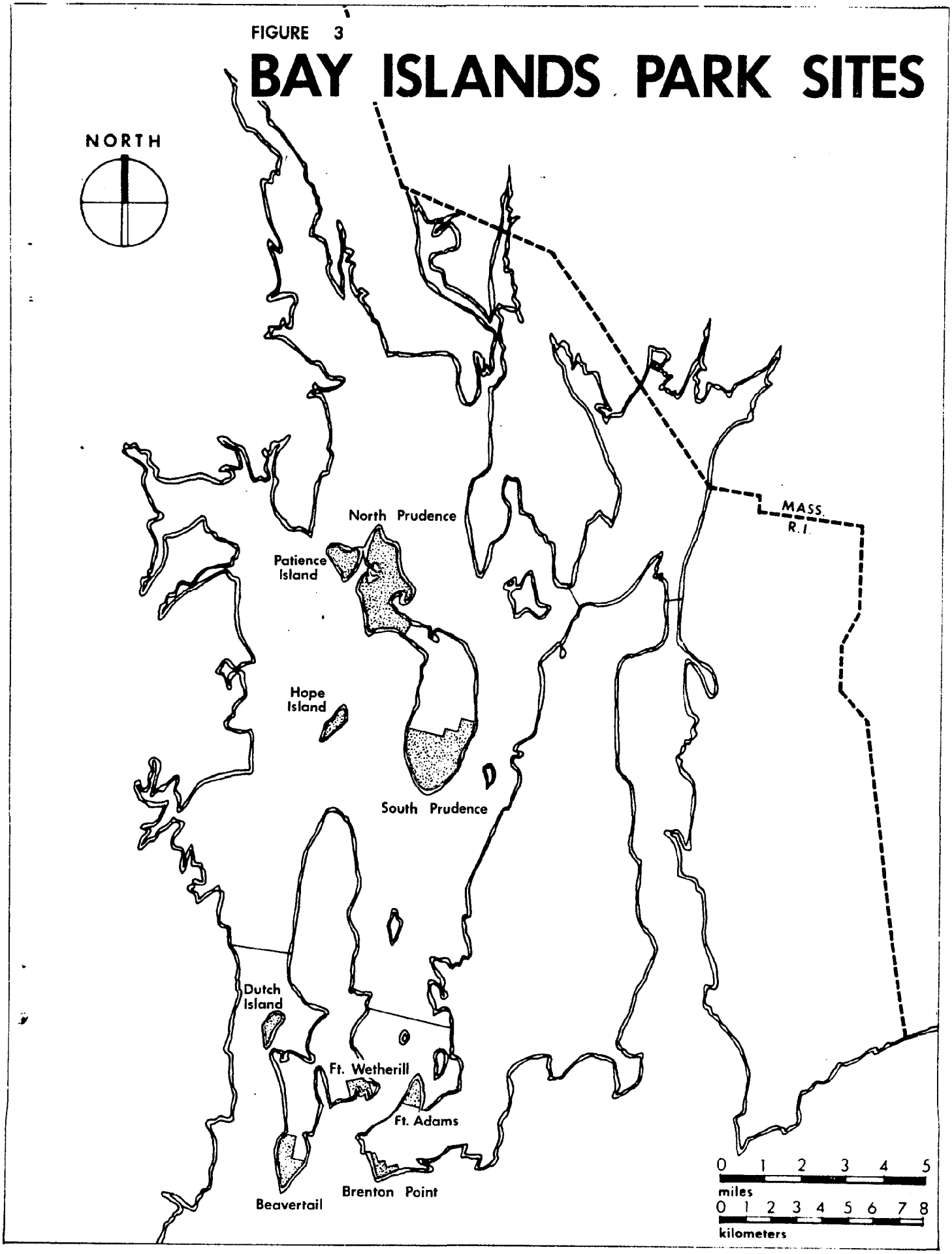
-- Providing for communication and cooperation among all sanctuary users.

3. Enforcement

The Enforcement Division of DEM would hire and train several field officers to enforce restrictions or prohibitions on activities within the sanctuary to preserve the integrity of the sanctuary lands and waters.

FIGURE 3

BAY ISLANDS PARK SITES



c. Allowable Activities

DEM would monitor all activities within the sanctuary. If any use or level of use threatens the sanctuary, DEM would take appropriate steps to eliminate the potential conflict. In addition, DEM intends to prohibit some activities altogether -- such as bringing pets and radios or other electronic devices into the sanctuary -- to avoid potential conflicts.

Narragansett Bay in general, and the Patience and Prudence Island areas in particular, are heavily used for recreational fishing, boating, and shellfishing during the summer months. Recreational boating within the proposed boundaries of the sanctuary is already so popular that the waters of Potter Cove, on the eastern side of northern Prudence Island, are classified as SB waters during the summer months. Rhode Island's water quality classifications are, in descending order, SA, SB, and SC (See Appendix III).

Establishment of this proposed sanctuary could attract recreational boaters to the sanctuary waters in even larger numbers. Should recreational boating in Potter Cove or anywhere else within the boundaries of the proposed sanctuary be found to cause, or threaten to cause, significant adverse environmental impacts on the sanctuary resources, DEM would relocate, restrict, prohibit, or otherwise control recreational boating within the sanctuary to whatever extent is necessary to protect water quality within the sanctuary.

Recreational and commercial shellfishing is another popular use of the waters around Patience and Prudence Islands. Dredging for shellfish within or near the waters of the proposed sanctuary is already prohibited by Rhode Island law. Instead, individuals use tongs or rakes, with a commercial limit of 12 bushels per day, and a recreational limit of 0.5 bushels per day. In Narragansett Bay, there are 300 full-time and 1,600 part-time shellfishers, who in 1978 harvested 2 million pounds of quahogs valued at $4.3 million. Continued shellfishing within the sanctuary would not conflict with its primary purpose.

Recreational hunting takes place on all three islands. On Patience and northern Prudence Islands, there is a bow-hunting season for deer from November 1 to January 31. Thirty deer were taken on northern Prudence during the past season. Patience and Prudence also have a small game season in February, and rabbits are hunted on Hope Island from October through January. Duck hunting takes place in November on Patience, Prudence, and the waters between the two islands. Duck hunting is restricted to within 10 feet above mean high water level.

The hunting itself appears to be compatible with the primary sanctuary purposes. For deer, hunting is actually desirable to prevent overpopulation and its associated malnutrition, disease, and habitat degradation from excessive foraging. Habitat manipulation to "improve" sites for game species, though, is incompatible with the purposes of the sanctuary. Proposals for

such actions would have to be approved by the Rhode Island Department of Environmental Management, in consultation with the SAC and OCZM. It is anticipated that potential conflicts can be identified and resolved by DEM before any actions take place that would reduce the sanctuary's value for research and education.

1. Northern Prudence Island

Existing uses on and around Prudence Island that would continue are hunting, commercial and recreational shellfishing, and recreational fishing and boating. New activities that would be introduced as part of the park and sanctuary programs would be interpretative activities, nature trails, research programs, and a limited number of primitive campsites.

2. Patience Island

Patience Island would be available on a reservation basis for groups to visit for environmental education programs. The island contains a variety of habitats (e.g. salt marsh, upland forest, and open fields), and would make an excellent outdoor environmental education center. Groups would be permitted to camp overnight to allow them the chance to study the island's ecology over a more extended period of time than would be possible during day trips. Only minimal facilities would be needed to accommodate such activity. Patience Island would also be available for scientific research, and several existing buildings on the island could be used to support research activities.

3. Hope Island

Hope Island has become one of the most important rookeries for wading birds in the Northeast, and would be managed under stricter controls than any of the other sanctuary sites. Current use of the island for small-game hunting from October through December would be permitted to continue. Guided interpretative tours would be offered during the late summer and early fall. The island would be closed to visitors -- except for qualified scientists with the approval of DEM -- during the nesting season, which runs from April 15 through July 31. No camping would be permitted on Hope Island.

d. Public and Private Access

The proposed sanctuary is located on islands with no bridge connection to the mainland. DEM can thus control access to the sanctuary through control of boat access to the islands, directly with respect to the ferry system serving the island sites, and indirectly with respect to privately owned boats wishing to moor or beach on the sanctuary islands.

1. Public Access

The public transportation system is designed to provide convenient, inexpensive access to the park sites that can accommodate relatively large numbers of people, and to limit access to the more fragile, comparatively undisturbed sanctuary sites. The ferry system would link Providence, Newport, North Kingston, and Portsmouth with the south end of Prudence Island, an already developed site that would serve as the ferry terminus, as well as park and sanctuary headquarters. Service would be provided by a large (500-person capacity) ferry that would make one round trip per day connecting Providence, Newport, and South Prudence, and a smaller (100-person capacity), faster ferry that would make several trips per day between North Kingston, Portsmouth, and South Prudence.

Transportation from South Prudence to the sanctuary sites would on a provisional basis be made available as follows:

-- to northern Prudence: a shuttle bus with a maximum capacity of 30 people would make 8 round-trips each day from South Prudence. Access to North Prudence would thus be limited to not more than 250 people per day arriving by public transportation.

-- to Patience and Hope Islands: public transportation would be provided on a demand basis. The smaller ferry would have enough free time built into its schedule to make at least one trip each to Patience and Hope per day.

2. Private Access

Narragansett Bay supports heavy recreational boating use during summer months, and some of the proposed sanctuary areas--especially Potter Cove on northern Prudence Island, and the waters between Patience and Prudence Islands--are customary mooring sites where boats anchor to spend several hours. When northern Prudence and Patience Islands were in private ownership, small numbers of people beached their boats and hiked or camped on the islands. With these islands in public ownership, it is safe to assume that larger numbers of people may want to beach their boats, or have docking facilities provided so that they can more easily come ashore. Rhode Island's policy with regard to private boats in the proposed sanctuary would be as follows:

-- the docks at Patience and northern Prudence Islands would be repaired so that small craft can dock, but only to let passengers off; docking for more than ten minutes would not be permitted;

-- Small boats may be beached on Patience and northern Prudence Islands where not prohibited. DEM may restrict or prohibit boats from certain areas such as the salt marshes on northern Prudence (because of their fragility), or the beach on Patience (because of potential conflicts with swimmers); and

-- DEM will monitor private boat use within the sanctuary waters, and if it is determined that private boat activities are damaging the sanctuary resources, or interfering with other uses, such as swimming, DEM may restrict boating activity by limiting boat use, mooring, or beaching to certain areas, and prohibiting it in other areas.

e. Education and Research

1. Education

The proposed sanctuary sites are well suited for educational programs, not only because Patience and Prudence Islands are capable of supporting such activities without significant harm, but also because of the proximity of Rhode Island's population centers to the sanctuary islands. Downtown Providence is only 12 miles from the northern end of Prudence Island. The center of Warwick (Rhode Island's second-largest city) is 5 miles from Patience Island. More than 600,000 people live within 10 miles of the sanctuary islands, offering a unique opportunity to provide sanctuary education programs for the public. With only a short ferry and bus ride, urban residents, school children, and families can enter an area with no development, clean water, pristine salt marshes, and unusual wildlife including a large deer herd and one of the Northeast's largest wading bird rookeries. The north end of Prudence Island in particular provides the opportunity to visit a number of different habitat types within a small area.

The proposed sanctuary would emphasize creation of an extensive interpretative program, including printed materials, guided and self-guided tours, resident naturalists, and guided boat trips. Both group and individual activities would be provided.

2. Research

The Patience and Prudence Island areas offer the opportunity for research into the dynamics of the Narragansett Bay estuary. Several factors influence the research potential of the proposed sanctuary sites:

-- The City of Providence and the rivers entering the Bay at Providence contribute significant pollution to the Bay.

-- At present, the dividing line between SA and SB waters lies just north of Prudence Island. The waters around Prudence Island -- particularly in and around Potter Cove -- experience changing pollution levels depending on weather and season.

-- The Prudence Island area is a major shellfish area, and extensive commercial and recreational quahogging takes place in its surrounding waters. An experimental, private oyster "farm" has been started on central Prudence Island. Lobstering takes place around Hope Island.

-- The University of Rhode Island has conducted extensive research in the area on pollution levels and their impacts on shellfish, and is constructing a computer model of the Upper Bay.

-- The U.S. Environmental Protection Agency has funded several studies of water quality and marine life in the Upper Bay.

Major research opportunities in this proposed sanctuary would generally fall in three categories: (1) research, analysis, and interpretation of the upland, intertidal, and benthic components of the Narragansett Bay estuary, (2) continuation of existing monitoring and sampling programs (described below), and (3) research to analyze the impact of various pollutants and pollution levels on estuarine life.

a. Existing Monitoring

1. Biannual finfish trawl survey: DEM's Division of Fish and Wildlife sets up random stations throughout the Bay twice each year to take fish counts, and to measure characteristics such as length, weight, and sex.

2. Lobster catch data collection: The Division of Fish and Wildlife collects information on the number of lobsters caught, the number of traps used, the number of hours spent trawling, and when and where the lobsters are caught, on a monthly basis. Very few lobsters are caught within the waters of the proposed sanctuary. The south end of Prudence Island marks the northern extent of lobster summer migration up the Bay.

3. Quahog sampling: Quahogs are currently taken and sampled for heavy metals and coliform count twice each month by the Health Department.

4. Paralytic shellfish poisoning sampling: Blue mussels and soft-shell clams from stations at the mouth of the Bay are sampled twice a month and tested by the Health Department for paralytic poisoning, a seasonal phenomenon associated with the occurrence of "red tides". If dangerous levels are found at the mouth of the Bay, tests are then made at stations progressively farther up the Bay to determine the extent of the poisoning.

5. Coliform testing: The Division of Fish and Wildlife tests Upper Bay water samples 35-40 times per year for total and fecal coliform bacteria, primarily to help determine whether the conditional area of the Upper Bay should be closed to shellfishing (See Fig. 8).

b. New Research

All of the land areas within the proposed sanctuary are essentially undisturbed, and almost all of the water areas are classified SA year-round. Thus, establishment of this proposed sanctuary would ensure the preservation of these lands, and, to a lesser extent, their surrounding waters, for future terrestrial, intertidal, and benthic research on a variety of estuarine topics. There are, however, several potential sources of pollution outside the proposed boundaries of the sanctuary -- including sewage and heavy metals from the urban areas around the Bay, and tankers and tank barges which pass within 1.5 miles of the eastern side of Prudence Island -- that could jeopardize sanctuary waters in the future.

Because the proposed sanctuary lies near the transition zone between the polluted waters of the Upper Bay and the relatively clean waters of the rest of the Bay, research and monitoring in and around the sanctuary could provide valuable baseline information against which the impacts of human activities throughout the Narragansett Bay estuary could be assessed. Such research and monitoring could have broad applicability to similar estuaries elsewhere in the Virginian biogeographic region, such as Chesapeake Bay.

B. Alternatives Considered

1. Funding

Rhode Island considered several sources of State and Federal funding for the creation of a preserve including Hope and Patience Islands and the north end of Prudence Island. The State purchased the north end of Prudence Island in 1978, using Land and Water Conservation Fund monies matched from the State's Recreation Area Development Fund. Land and Water Conservation Fund monies were also considered for purchase of Patience Island. State revenues from hunting and fishing licenses would be used for the State share of the cost of purchasing Patience Island.

Estuarine Sanctuary Program funds were selected for the Patience project for three reasons:

-- Land and Water Conservation Fund monies are not available this fiscal year, and may not be available next fiscal year;

-- The Estuarine Sanctuary Program includes three years of management funds, which would be useful to the proper management of the proposed sanctuary in the first years after its establishment.

-- The Estuarine Sanctuary Program would attract national attention to the area, and thus enhance the research, education, and recreation opportunities.

Within Rhode Island, hunting and fishing license receipts were selected as a match for the proposed sanctuary grant rather than Recreation Area Development Fund monies, because of the high wildlife values of the islands, and also because Recreation Area Development Fund monies are committed to development projects elsewhere in the State.

2. Site Selection

Selection of the Prudence/Patience/Hope area as an Estuarine Sanctuary candidate was the result of a lengthy site selection process.

The northern end of Prudence Island and Patience Island were designated as part of the proposed Bay Islands Park system after extensive public discussion, including public hearings and input from a special citizens' committee. The process included adoption of the Patience/Prudence acquisitions as part of the State's Comprehensive Outdoor Recreation Plan (SCORP), an element of the State Guide Plan. Inclusion of the Bay Islands Park proposal in the State Comprehensive Outdoor Recreation Plan was approved by the State Planning Council after public hearings. The SCORP envisions Patience and the north end of Prudence Islands as conservation and wildlife management sites with low-intensity public use. Official State policy thus designates these two sites as areas to be set aside for conservation and wildlife management purposes, although estuarine sanctuary designation was not specifically considered when Rhode Island's SCORP was adopted.

When OCZM's Sanctuary Programs Office informed the Chairman of Rhode Island's Coastal Zone Management Council (CZMC) that funds might be available for an estuarine sanctuary in the Northeast States, the Coastal Resources Center at the University of Rhode Island (CRC), in cooperation with DEM, initiated a review of possible sites.

At first, CRC believed that one of Rhode Island's coastal ponds or tidal rivers might be the most appropriate estuarine sanctuary candidate in the State. All such areas were identified and evaluated. Four of the most promising sites were then reviewed by CRC and DEM staff, including biologists from the Division of Fish and Wildlife. Each of the four sites (listed below) was found to have both strengths and drawbacks.

1) Quicksand Pond in Little Compton: this is the most pristine site, and an outstanding example of a coastal pond with a natural breachway. Most of the shore of the pond is undeveloped. However, there were strong local objections, the purchase price would be very high, research possibilities are limited because of the site's distance from institutions, and even without sanctuary status the site is likely to remain in its comparatively undeveloped state as a result of the pattern of landholdings surrounding it.

2) Palmer River: this estuary was considered a good candidate, except that 85% of its watershed, including the most undeveloped portion, lies in Massachusetts, thereby complicating the initiation and successful execution of the project. Moreover, parts of the estuary are heavily developed.

3) Pettaquamscutt River: this tidal river in the Towns of Narragansett and North Kingston has many interesting features, including unusual upper basins, and is surrounded by large undeveloped tracts of land. However, the character of much of the river is such that research here would have limited applicability to other areas, and the central portion of the riverway is heavily developed with small summer cottages on both shores, making control or acquisition of the area difficult or impossible. Subsequent investigations have shown this area to be seriously polluted from domestic septic systems.

4) Potter's Cove: this is a cove off Point Judith in South Kingston (entirely separate from the Potter Cove occurring on northern Prudence Island) with potential as shellfish habitat, and with an upper cove that is almost fresh water. However, much of the shoreline is intensely developed, and the remainder is in small ownerships, so that acquisition would be difficult.

After further analysis by representatives of CRC, DEM, OCZM, and the Coastal Zone Management Council, the Prudence/Patience/Hope sites emerged as potential candidates. Meetings were held to pursue the concept, which drew the support of the Governor. Thereafter, the northern end of Prudence Island, Patience Island, and Hope Island were nominated, for the following reasons:

1. The sites are essentially undisturbed, and contain a wide range of terrestrial and estuarine flora and fauna.

2. Located just south of the present shellfish closure line for the Bay, the area has the potential for significant research into Bay dynamics and pollution problems. Such research could easily be tied into ongoing research and monitoring elsewhere in the Bay, and could have broad applicability elsewhere in the Northeast.

3. The islands are located in the center of Rhode Island's populated areas, thus offering numerous opportunities for educational activities.

4. An estuarine sanctuary would fit well with the Bay Islands Park system. Moreover, establishment of an estuarine sanctuary would provide financial support, which would assist in the startup of the Bay Islands Park.

5. No present or planned uses in the sanctuary area are in conflict with the purposes of the Estuarine Sanctuary Program. Fishing, shellfishing, and hunting are generally compatible uses, and establishment of an estuarine sanctuary here would help to preserve the living resources of the area.

6. The salt marshes on Patience and Prudence Islands are some of the most extensive and pristine wetlands remaining in Rhode Island.

3. Boundaries

a. Water Boundaries

The proposed sanctuary lies within the Narragansett Bay estuary, and includes islands in the middle of the Bay together with their surrounding waters. Since the entire estuary cannot be included within the sanctuary, any water boundaries will be of necessity less than all-inclusive.

The proposed water boundary is the 18' isobath. This line was chosen for several reasons:

-- it is a relatively easy water boundary to identify. Nautical charts indicate waters less than 18' feet deep in white, areas deeper than 18' in blue. Four permanent buoys lie on the 18' isobath around the sanctuary.

-- the 18' isobath includes Potter Cove, Coggeshall Cove, and the waters between Prudence and Patience Islands. Since these areas are popular recreational boating sites in the summer, inclusion of these water areas within the sanctuary is desirable so that restrictions can be imposed if necessary.

b. Land Boundaries

Two alternative land boundary configurations considered by Rhode Island were the inclusion of southern and central Prudence Island, and the exclusion of Hope Island.

1. Southern and Central Prudence Island

The southern end of Prudence Island consists of 624 acres, all owned by the State. Rhode Island considered including some or all of the southern end of Prudence Island within the proposed sanctuary, but chose not to for two reasons: (1) the site was extensively developed by the Navy, its former owner, far more than the other island sites, and to such an extent that it

does not meet the 'essentially undisturbed' criterion, and (2) southern Prudence will be the main center for the Bay Islands Park system, and will support facilities and activities incompatible with the primary purpose of the sanctuary.

Central Prudence Island consists of 2,129 acres, all privately owned. Much of the eastern shore in this central portion has extensive residential development, and the central Prudence lands are held by about 400 separate owners. For these reasons, Rhode Island chose not to pursue the inclusion of central Prudence Island within the proposed sanctuary. If individual owners approach the State and offer to sell fee simple title or conservation easements, Rhode Island would be willing to consider such acquisitions. These would be undertaken only on an owner-initiated, voluntary basis.

2. Hope Island

Rhode Island considered excluding Hope Island from the sanctuary, but chose not to on account of the additional protection sanctuary status might provide, particularly for the extremely important wading bird rookery.

4. No Action

Under this alternative, Patience would not be acquired, and Patience, northern Prudence, and Hope Islands would not be designated as an estuarine sanctuary. Northern Prudence and Hope Islands would still be part of the Bay Islands Park system and, as such, would still be protected. However, sanctuary designation and the provision of management funds would help establish a better management structure, strengthen the educational and interpretative programs offered to the public, encourage additional scientific research in the Bay, and provide national recognition for the area.

Patience Island was recently purchased by The Nature Conservancy (TNC) with the expectation that Rhode Island would purchase it from them for inclusion in the proposed estuarine sanctuary. If the sanctuary is not established, and the State does not receive funds to purchase Patience Island, The Nature Conservancy could retain ownership and manage it for research and education purposes, or explore other forms of public ownership, through such agencies as the U.S. Fish and Wildlife Service, or sell it to a private party. TNC ownership would restrict State or Federal funds for operations, and could result in limited access or educational programs due to lack of funds.

PART III: ENVIRONMENTAL CONSEQUENCES

A. Environmental Consequences of the Proposed Action

1. General Impacts

The overall impact of establishing Rhode Island's proposed estuarine sanctuary would be environmentally beneficial. The proposed sanctuary would require minimal development or physical alteration of the existing natural environment. It would not significantly affect current uses or activities in or near the proposed sanctuary area.

The most direct environmental benefit of this action would be the long -term preservation of three islands and their resources for scientific, educational, and recreational purposes. As a base for research and education, the sanctuary should increase our understanding of estuarine ecosystems, an important goal of the Rhode Island coastal zone management program. The proposed sanctuary, which has been chosen as a representative estuary of the Virginian biogeographic region, would provide basic knowledge necessary for a more complete understanding of estuarine processes.

The proposed educational program would increase public knowledge and awareness of estuarine ecosystems, their benefits, and their sensitivities, and would therefore contribute to increased public understanding of and support for coastal zone management activities. Recreational opportunities would also be enhanced for urban residents around the Bay.

Potential adverse environmental impacts resulting from the establishment of this proposed estuarine sanctuary are those associated with the increased number of persons expected to visit the islands for scientific, educational, and recreational purposes. These minimal potential adverse impacts would include soil compaction, local habitat degradation for fish and wildlife uses, destruction of habitat from construction and trail maintenance activities, disturbance of sensitive nesting bird species, litter, water pollution from recreational boats anchored or operating near the islands, etc. These impacts would probably occur regardless of the estuarine sanctuary, assuming Patience Island would be in public or Nature Conservancy ownership.

2. Local Impacts

a. Natural Environment

1. Fish and Wildlife Habitat

A variety of fish and wildlife species -- both resident and migratory -- use the proposed sanctuary lands and waters for food, shelter, nesting, and nursery areas. Establishment of this sanctuary would ensure long-term protection of the three island ecosystems, thereby preserving valuable fish and wildlife habitat.

Increased visitor use of the sanctuary for educational and recreational purposes, though, could adversely affect the sanctuary's value as fish and wildlife habitat. Uncontrolled hiking, camping, boating, and other recreational activities could be expected to result in greater noise, litter, soil compaction, water pollution, and other forms of habitat degradation. To keep such adverse impacts within tolerable levels, Rhode Island intends to control the location and levels of human activities within the proposed sanctuary. Hope Island, for example, whose wading bird rookery is the most sensitive and vulnerable area within the sanctuary, will be closed to visitors during the April 15-July 31 nesting season. Moreover, certain areas on Patience and northern Prudence Islands would be kept free of trails to maintain undisturbed habitat for deer and other wildlife.

2. Soils and Vegetation

Adverse impacts on soils within the proposed sanctuary can be minimized if proper precautions are taken. Trail construction and improvement would be undertaken only on suitable, well-drained soils that can tolerate increased compaction. Appropriate siting and maintenance procedures would be followed where a trail must cross a wetland. Boardwalks would be used in any wetland area, which would allow the visitor to visit and experience the wetland, while minimizing detrimental effects.

Vegetation would not be significantly affected by establishment of the sanctuary. Maintenance and, where necessary, rerouting of existing trails would reduce the impact on vegetation. New trails would be laid out to avoid fragile vegetative areas altogether.

3. Water Quality

Establishment of this sanctuary would prevent water pollution that might otherwise occur due to onshore development within the proposed sanctuary. On the other hand, increased recreational boating within sanctuary waters may lead to increased pollution from sewage, motor oils, and litter. The waters of Potter Cove on the eastern side of North Prudence Island are already classified as SB during summer months as a precautionary measure because of heavy recreational boating usage. Rhode Island will monitor recreational boating impacts within the sanctuary, and use its authority to restrict, relocate, or otherwise control recreational boating as needed to protect the sanctuary lands and waters.

b. Human Environment

1. Residents of Prudence and Patience Islands

There are about 50 year-round residents on central Prudence Island, and about 1,000 during the summer. None of these residents would be displaced as a result of this proposed action. Rhode Island's Department of Environmental Management is working with the island residents to minimize the adverse impacts of the sanctuary and Bay Islands Park upon them. This would be achieved primarily by providing public access for park visitors to park sites only. Ferries bringing visitors to the sanctuary would dock at South Prudence, and a shuttle bus would transport visitors to the sanctuary site at the north end of the island, with no stops in the central, privately owned portion of the island.

2. Town of Portsmouth

Acquisition of 203 acres on Patience Island would result in the loss of tax revenue to the Town of Portsmouth, which in 1978 amounted to $3,728. This economic loss would probably be more than offset by the new jobs and commercial activities associated with the ferry landing in Portsmouth to serve the Bay Islands Park system and the estuarine sanctuary, and by the spending of some or all of the sanctuary management salaries and other monies in the area.

3. State and Federal Impacts

Establishment of the sanctuary would preserve for Rhode Islanders and others from southeastern New England a natural area to enjoy and use for recreational and educational purposes. This would be particularly beneficial for the residents of the urban areas around Narragansett Bay.

Acquisition and management of the proposed sanctuary would have relatively minor short-term financial impacts on the Federal government and the State of Rhode Island. The State will be responsible for funding the long-term operation of the sanctuary. These expenditures are expected to be offset by the acquisition of improved scientific and technical knowledge, which could be applied to the management of estuarine resources here and elsewhere. The sanctuary would also protect wetlands, in accordance with Executive Order 11990, the Protection of Wetlands.

B. Unavoidable Adverse Environmental or Socioeconomic Effects

There are no unavoidable adverse environmental effects associated with this proposed action. Unavoidable adverse economic effects would include the loss of tax revenue (approximately $3,728) to the Town of Portsmouth through the public acquisition of Patience Island. However, some or all of this lost tax revenue would be offset by new spending in the Town of Portsmouth by sanctuary visitors and management personnel. In addition, establishment of this proposed sanctuary could result in minor disruptions to the residents of central Prudence Island from the shuttle bus carrying visitors to the sanctuary site on northern Prudence Island. Efforts would be made to minimize such disruptions.

C. Relationship Between Local, Short-Term Uses of the Environment, and the Maintenance and Enhancement of Long-Term Productivity

The purpose of the proposed action is to preserve Hope, Patience, and northern Prudence Islands in perpetuity for research and educational purposes, and to guarantee long-term productivity, to the benefit of numerous fish and wildlife species. Regulated harvest of natural resources would be permitted to continue, but no short-term or exploitative uses would be permitted to take place at the expense of long-term productivity or public utilization. Moreover, the commercial shellfishery is a product of the natural environment, so that establishment of this proposed sanctuary --

by precluding development that might otherwise take place on these sites -- should also contribute to the maintenance of long-term economic productivity within Narragansett Bay.

Research conducted within the sanctuary, and the increased public awareness of coastal and estuarine processes resulting from educational use of the sanctuary, should enhance Rhode Island's ability to resolve conflicts, mitigate adverse impacts, and otherwise maintain the long-term productivity of its coastal resources.

D. Irreversible or Irretrievable Commitments of Resources

Within the proposed sanctuary, there are no resources that would be irreversibly or irretrievably lost, since the intent of this proposed action is to protect and manage these resources.

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

As noted earlier, this proposed estuarine sanctuary would be managed as part of the Bay Islands Park system. The objectives of these two programs are compatible and mutually supportive. All current land use policies and plans applicable to the sanctuary sites call for establishment of the Bay Islands Park system. Thus, no conflicts are anticipated between this proposed action and the objectives of Federal, regional, State, or local land use plans, policies, and controls for the area concerned.

1. Federal and Regional Plans

The New England River Basins Commission prepared in 1975 a Southeastern New England (SENE) Study, a 'level B' water and related land resources study under the provisions of the Federal Water Resources Planning Act of 1965. The main purpose of the SENE study was to recommend public and private actions that would secure for the people of the region the full range of benefits resulting from balanced use and conservation of the region's water and related land resources. The SENE study recommended that Rhode Island give "highest priority" to establishment of the Bay Islands Park system, including Prudence, Patience, and Hope Islands.

2. State Plans

Three State plans apply to Patience Island, Hope Island, and the northern end of Prudence Island. They are the Bay Islands Park system, the Rhode Island State Guide Plan, and the Rhode Island Coastal Resources Management Plan.

The purposes, policies, and objectives of the Bay Islands Park system -- of which this proposed sanctuary would be a part -- are presented on page 6. Establishment of this estuarine sanctuary would be entirely consistent with the purposes of the Bay Islands Park system.

The Rhode Island State Guide Plan directs State policies and actions. Two relevant elements of the Guide Plan are: the State land use policies and plan, and the State Comprehensive Outdoor Recreation Plan (SCORP). The 1990 Land Use Plan calls for the use of these islands for conservation and recreation purposes. Section 09-01-02 of the SCORP calls for the creation of a Bay Islands Park system as a high priority. This recommendation includes conservation use of the three island sites.

Rhode Island's Coastal Resources Management Plan, which has been adopted by the State's Coastal Resources Management Council, and approved by NOAA's Office of Coastal Zone Management, guides and regulates uses and activities in the coastal zone. Section 470 calls for the establishment of a Bay Islands Park system including the three islands proposed to be included within the estuarine sanctuary.

3. Local Plans

A comprehensive plan for the Town of Portsmouth is currently being prepared by the Town Planning Board of Portsmouth with the assistance of the Rhode Island Department of Community Affairs. A draft of the plan calls for conservation and recreational use of Patience Island and the northern end of Prudence Island. The Town has not yet formally adopted the plan.

PART IV: AFFECTED ENVIRONMENT

A. Natural Environment

1. Narragansett Bay

Narragansett Bay extends twenty-five miles north from Rhode Island Sound. Providence, the State's largest city, lies at its head. The Bay is as much as twelve miles wide, and is divided by Conanicut and Aquidneck Islands into three main channels (Fig. 1). The proposed estuarine sanctuary includes all or part of three islands -- Prudence, Patience, and Hope, situated in the geographic center of the Bay 12 miles south of Providence -- and their surrounding waters.

a. Geology

During much of the last Ice Age, Narragansett Bay was an upland valley with rivers flowing toward a sea whose shore lay off what is now Block Island. As the glaciers moved southward, they covered the land with ice as much as a mile thick, scouring and scraping the land to create the gentle contours characteristic of the Rhode Island landscape. As the glaciers retreated, they deposited vast quantities of boulders, sand, and sediments in the Bay area.

The Bay islands are artifacts of this glacial action. The rocky crags and headlands of Hope Island were laid bare by glacial scouring. The land masses of Prudence and Patience Islands were deposited as moraines by the retreating glaciers. These islands are composed primarily of glacial till -- a poorly sorted mixture of boulders, pebbles, gravel, sand, and clay. The till varies considerably in thickness, and frequently contains layers of clay hardpan that form nearly impermeable barriers to water penetration. Much rainfall is consequently lost to surface runoff, with little retained as ground water. Freshwater reserves are therefore limited on the islands, and residential wells frequently run dry during the summer months. Water supply problems are compounded by a scarcity of surface impoundments, such as ponds or wetlands. Little runoff is captured to percolate into the soil; most is lost to the Bay.

Topsoils on the Bay islands are rarely more than three feet deep, and vary considerably in composition. They have been formed by the weathering of glacial deposits, and by accumulation of organic matter from a vegetative cover of mixed hardwood and coniferous forest. Except over scattered bedrock outcrops, bearing strengths are generally poor to fair, while stability ranges from poor to reasonable.

b. Hydrology and Climate

Narragansett Bay is a partially mixed estuary covering 451 km.^{2} (174 miles^2), with a drainage basin of 4,790 km.^{2} (1,849 miles^2) in Rhode Island and Massachusetts. The Bay consists of a series of drowned river valleys, and contains 387 km. (240 miles) of shoreline. Average depth is 7.5 m. (24.6 ft.) in the West Passage and 15.2 m. (49.9 ft.) in the East Passage. The Bay sediments are primarily silts or clays in the Upper Bay, and fine sands toward the mouth.

The flow of fresh water into the Bay varies seasonally, with an average input of 36 m.^{3} second. Rainfall amounts to about one meter/year, and river discharge usually peaks in March and April. The small freshwater input and large tidal volume result in a well-mixed water column and small salinity gradients through the Bay. Salinities range from about 22 parts per thousand (ppt) in the Providence River to 32 ppt at the mouth of the Bay.

Tides are semi-diurnal, and vary in height from 1.1 m. (3.6 ft.) at the Bay mouth to 1.4 m. (4.6 ft.) in the Upper Bay. The favorable cross section/length ratio of the Narragansett basin ensures reasonably good flushing rates in the Bay. Water temperatures range from 0.5° C to 24° C. During extreme conditions, the temperature of surface waters in the Bay can vary by as much as 10° C.

Narragansett Bay's climate is influenced by proximity to the ocean, with cool, breezy summers, and relatively mild but damp winters. Mean air temperatures range between a July high of 68° to 71° F and a February low of 27° to 32° F. It has been estimated that Narragansett Bay lowers the summer mean maximum temperature in Providence by as much as 4° F, and exerts a similar moderating influence in the winter.

c. Biology

Narragansett Bay is a phytoplankton-based ecosystem whose waters teem with coastal and marine life. Salt marshes provide abundant food and shelter for the adults and young of many species of finfish and shellfish.

Major finfish species in the Bay include bluefish, striped bass, winter flounder, and tautog. In 1976, there were estimated to be about 1.8 million pounds of striped bass and about 0.6 million pounds of bluefish in the Bay. No estimates have been made for winter flounder or tautog. The Upper Bay and Mount Hope Bay are also important spawning areas for menhaden, whose population in the Bay exhibits marked cyclical variations.

The Bay bottom supports mussels, lobsters, and crabs, but by far the most important shellfish is the quahog, or hard-shell clam. Quahogs are abundant throughout the Bay, but the heaviest concentrations occur in the West Passage, Greenwich Bay, the Upper Bay, and the edges of the Providence River. Quahogs spawn from mid-June to mid-August, and feed on phytoplankton filtered from the water. Quahog biomass in the Bay is estimated at 37 million pounds.

Narragansett Bay is situated on the Atlantic Flyway for migrating birds, so that its native bird population is swelled each spring and fall by migratory species -- including three kinds of hawks, warblers, and others -- travelling between winter and summer habitat. Waterfowl congregate in coastal marshes around the Bay, where they winter or rest and feed before continuing south. The annual bird migrations are paralleled by annual migrations of the monarch butterfly.

2. The Island Sites

a. Northern Prudence Island

The terrain of northern Prudence Island has a low profile, with slopes of 3-15 percent and a maximum elevation of 70 feet (Fig. 4). The soils are gravelly, sandy, and silty loams. Isolated hummocks and a long north-south ridge of unconsolidated glacial material are among the island's notable land features, as well as extensive salt marshes. Aside from the marshes, the remaining shoreline consists of pebble beach, with a small sand beach on the western shore near Pine Hill Point.

Several hundred acres of pristine salt marsh occur in Sheep Pen Cove, Potter Cove, and Coggeshall Cove. These marshes serve as spawning areas for large populations of finfish and shellfish. Quahogs and menhaden are taken commercially offshore, with the annual value of the quahog catch estimated at $2 million. The area also supports recreational quahogging and sport fisheries for bluefish, striped bass, sea trout, and tautog.

The salt marshes provide nesting habitat for clapper rail, seaside sparrow, and sharp-tailed sparrow, species limited to this habitat type. In addition, non-resident and migratory bird species -- including snowy egret, great egret, black-crowned night heron, little blue heron, least tern, and various waterfowl species -- feed in the marshes.

Northern Prudence uplands are covered with dense shrub growth of bayberry, highbush blueberry, and shadbush interspersed with red cedar, red maple, sapling oaks, and pitchpine. Deciduous forest, primarily mixed oak, is slowly replacing the shrub in some areas. These vegetated areas support large populations of small game species, including ring-necked pheasant, cottontail rabbit, grey squirrel, and red fox, as well a portion of the densest population

of white-tailed deer in New England. The deer herd on the entire island is estimated at 400 animals.

b. Patience Island

Patience Island, 207 acres in size, lies to the west of northern Prudence (Fig. 5). At their closest point, the two islands are 900 feet apart. Patience has gentle topographic contours with a maximum elevation of 50 feet. The shoreline is primarily pebble beach, with a small sand beach and adjacent salt marsh on the eastern side of the island. This salt marsh contains the seablite (suada maritima) -- a plant species found only in salt marshes -- which has been found in only three other Rhode Island locations.

The soils on Patience Island are silty loams with good drainage. Upland vegetation includes dense concentrations of tall shrubs interspersed with red cedar in the overstory. Dominant shrubs include bayberry, highbush blueberry, shadbush, poison ivy, and European bittersweet. Deciduous forest is gradually replacing the shrub habitat in some parts of the island.

The uplands support populations of red fox, cottontail rabbit, and ring-necked pheasant. Cove areas along the coastline are used extensively as feeding areas by migrant and wintering waterfowl species. Common loon and horned grebe occur frequently, as do greater scaup, canvasback, great cormorant, black duck, and scoters.

c. Hope Island

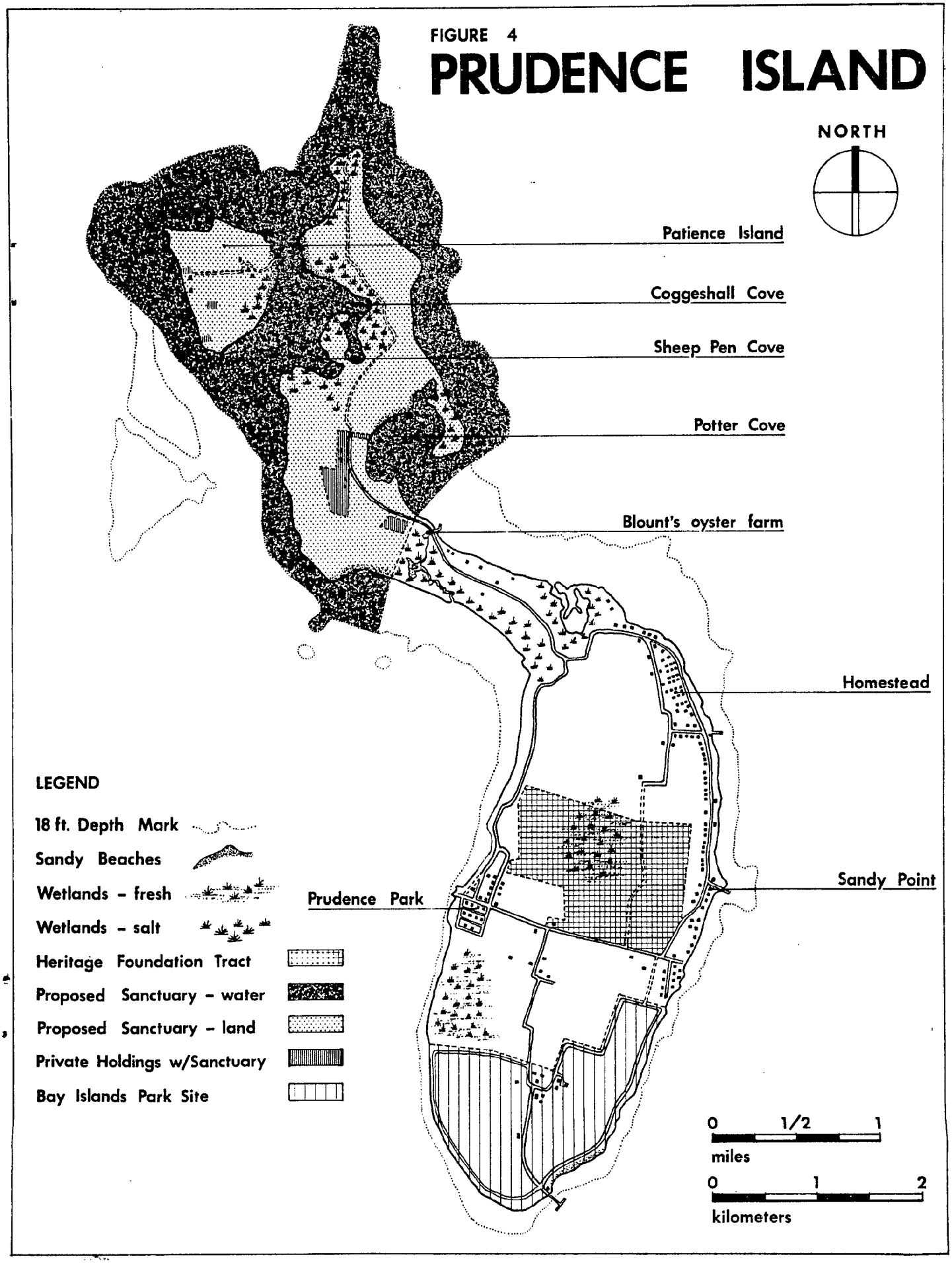
Hope Island, 92 acres in size, is located 3 miles south of Patience Island and 1.5 miles west of Prudence Island (Fig. 6). Rhode Island acquired Hope Island in 1975 when it was abandoned as surplus property by the Navy, which had used it as an ammunition depot during World War II. The bunkers, perimeter road, and telephone poles on the island are remnants of this use.

Hope's topography is very irregular, with numerous low hills, ledges, and rock outcrops. Maximum elevation is 60 feet. The shoreline is generally steep and rocky. A small freshwater wetland exists in a depression in the south-central portion of the island.

Vegetation on Hope Island consists of grasses, sedges and low shrubs of bayberry, rose, and poison ivy. The center of the island contains tall shrubs and sapling trees, including red cedar, staghorn sumac, shadbush, and black cherry. The dense vegetation on Hope Island is utilized by small game species, especially cottontail rabbit. The island is also valuable as a stopover point for migrating birds, including many kinds of warblers, vireos, and sparrows.

FIGURE 4

PRUDENCE ISLAND



The most important feature of Hope Island is the large rookery of wading birds, one of the most significant nesting areas for wading birds on the East Coast. There are currently an estimated 1,000 pairs, including black-crowned night heron (382 pairs), little blue heron (43 pairs), great egret (6 pairs), snowy egret (318 pairs), cattle egret (120 pairs), and glossy ibis (140 pairs). Herring gulls and great black-backed gulls also nest on Hope Island, and common terns nest on exposed rocks offshore.

Ospreys, which are not now found on Hope Island, are starting to reestablish themselves in the estuaries and coastal areas of southern New England. In the future, ospreys may establish nesting sites on Hope Island. To encourage this, Rhode Island may leave standing some of the telephone poles installed on Hope Island by the Navy.

Wintering harbor seals occasionally use the exposed offshore rocks as haulout and resting sites. Soft-shell clams, lobster, bluefish, striped bass, flounder, sea trout, and tautog are abundant in the waters and bottoms around Hope Island.

B. Human Uses of Narragansett Bay

1. History

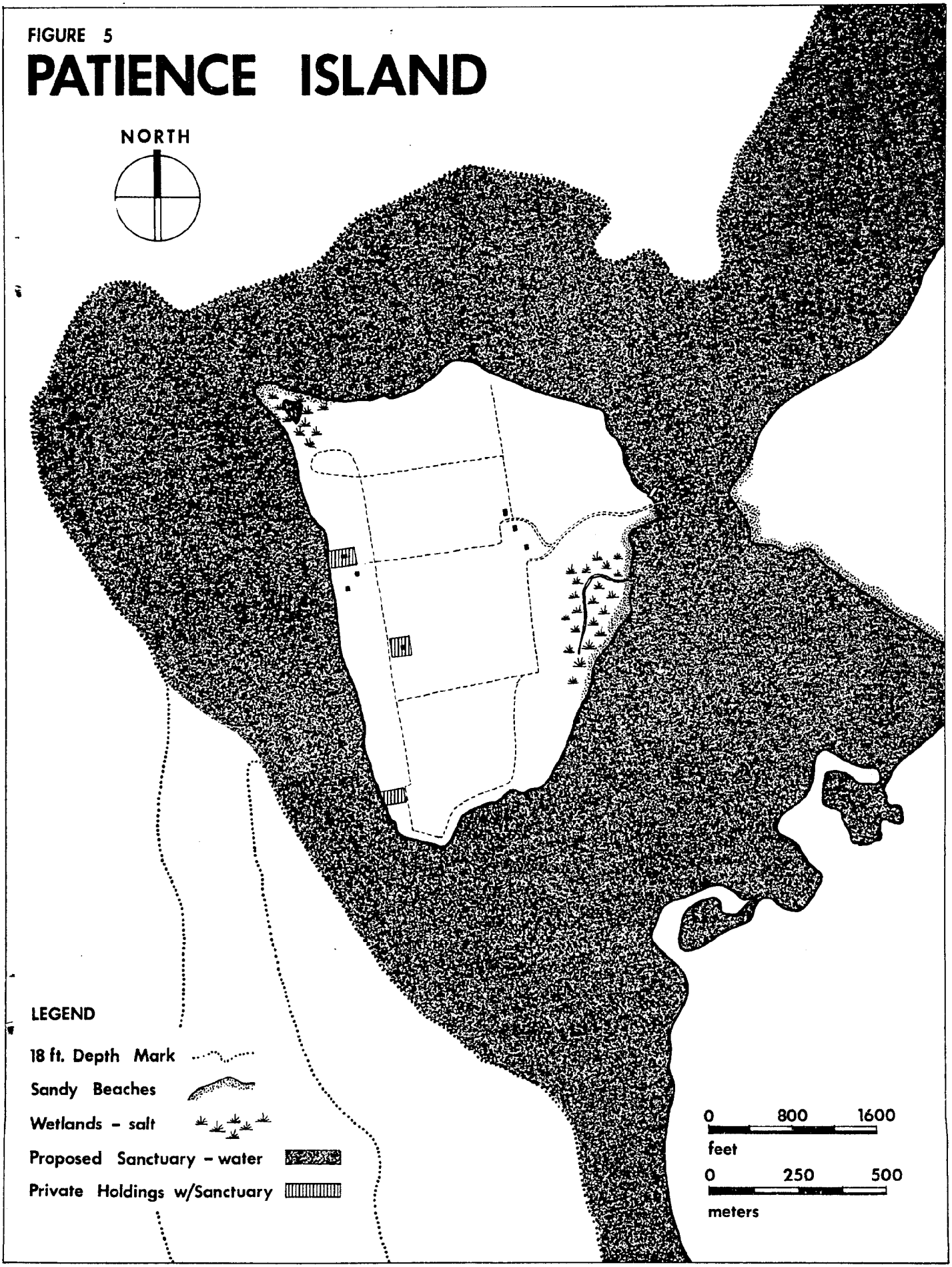
Narragansett Bay is Rhode Island's principal natural resource. The Bay has been the basis of the region's economy throughout its history, and most Colonial settlements were located along its shoreline.

Prudence, Patience, and Hope Islands were sold to Roger Williams by Chief Canonicus of the Narragansett tribe early in the seventeenth century. Williams gave the islands their present names. The islands were settled, cleared, and farmed well into the nineteenth century. Since then, the farms have disappeared, and the land has largely reverted to its previous state.

The middle of Prudence Island became a summer colony for the wealthy of Providence and Bristol in the late 1800s. Early in this century, a summer colony of more modest homes developed along its eastern shore. Although proposals have been made to develop Patience Island, a combination of factors -- its poor access, poor soils, and lack of water -- has kept it undeveloped except for the two summer homes it now has. The northern end of Prudence Island has remained undeveloped for the same reasons, but also because the land has been owned by a succession of people who wished to maintain it in its essentially undisturbed state. Hope Island is unsuitable for residential development.

FIGURE 5

PATIENCE ISLAND



2. Socioeconomic Characteristics

Although the smaller islands of Narragansett Bay have remained undeveloped, the shoreline has sustained intensive development, which began with the older cities and has since expanded outward. Industry and trade clustered around the Bay and its tributaries following the growth of population in these areas and the concurrent growth of pools of skilled labor. About 700,000 people currently live in Rhode Island and Massachusetts communities bordering the Bay (554,000 in Rhode Island, and 146,000 in Massachusetts). In Rhode Island, these towns and cities comprise about 60 percent of the entire State population. All of these communities are located within 15 miles of the proposed sanctuary. The two largest cities -- Providence, R.I., and Fall River, Mass. -- are both located 12 miles from the island sites.

a. Rhode Island

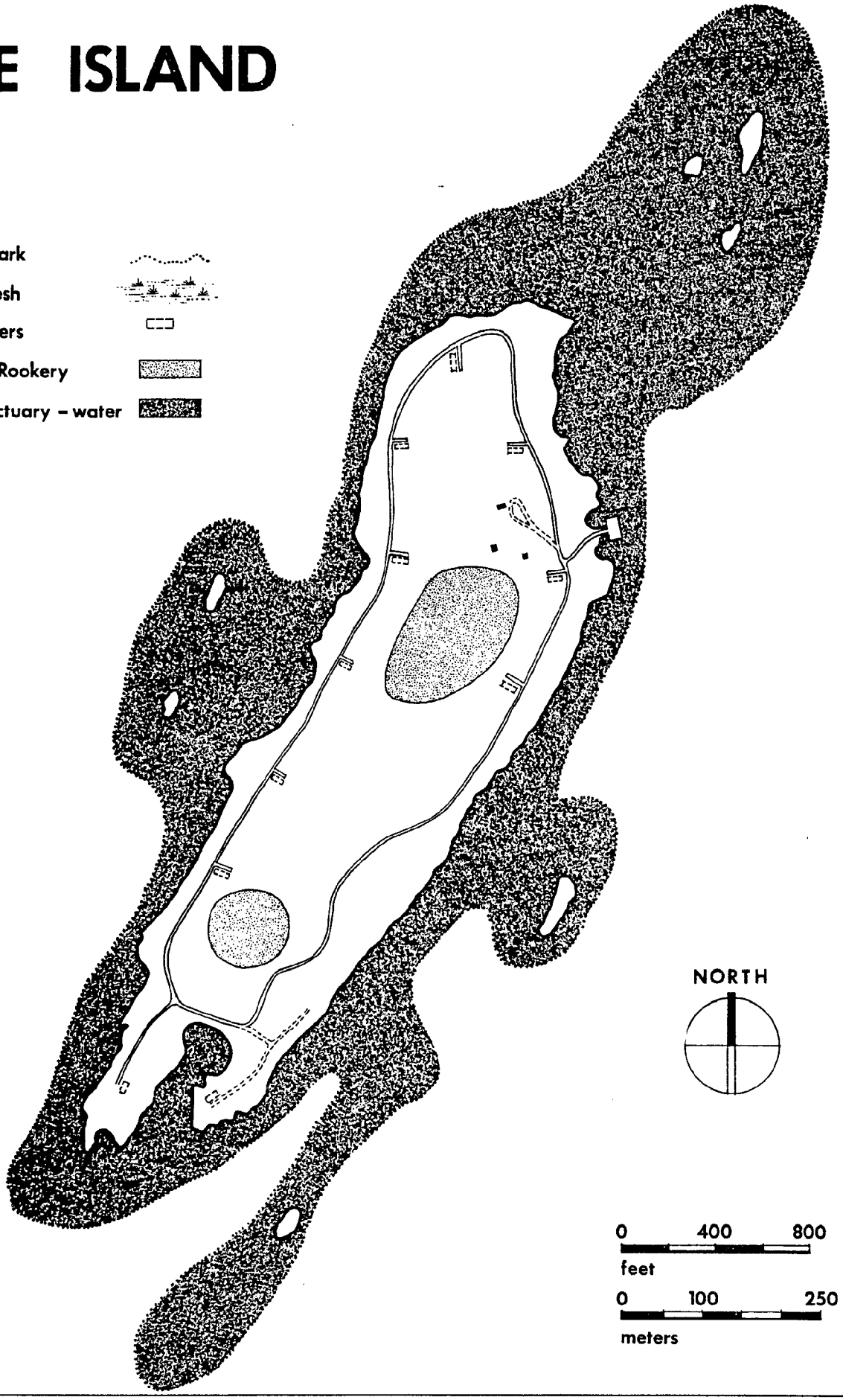
Narragansett Bay's strategic location and excellent harbors led to its early use as a base for U.S. Navy operations. The Navy was formerly the largest single employer in Rhode Island, and produced the highest level of dollar output directly attributable to the Bay. Following the closure of major Navy bases in the Bay during 1974-77, Rhode Island's population fell from 950,000 in 1970 to 935,000 in 1978. Total State population is now stable, but considerable growth is occurring in some parts of the State as people continue to move out of the older cities. Since World War II, cities such as Central Falls, Newport, Providence, Pawtucket, and Woonsocket have lost population, while towns such as Coventry, Cumberland, East Greenwich, Middletown, Narragansett, North Kingston, Portsmouth, Smithfield, and South Kingston have gained in population and new development.

Per capita income in Rhode Island has been growing more slowly than in the Nation as a whole. In 1975, Rhode Island's per capita income ($5,709) was 97.4 percent of the nationwide per-capita income ($5,861), placing Rhode Island twenty-sixth among the fifty States.

Unemployment in Rhode Island reached a peak of 11.1 percent in 1975 due to the closing of the Naval bases and the nationwide recession of 1974-75. Though Rhode Island's unemployment rate remains higher than the national average, the gap is narrowing. In 1978, Rhode Island's unemployment rate stood at 6.7 percent, compared with a national average of 6.0 percent.

FIGURE 6

HOPE ISLAND



b. Portsmouth

The proposed estuarine sanctuary is located within the Town of Portsmouth. The town economy, heavily dependent on a nearby Naval base, suffered severely when the base closed in 1974. Since then, Portsmouth has diversified its economic base. While the total number of jobs in Portsmouth remained almost unchanged from 1970 to 1975, it increased by 25 percent between 1975 and 1977. Major employers include firms devoted to electronics, boat building, wire manufacturing, and regional distribution of lumber products.

3. Current Uses of Narragansett Bay

The lands around Narragansett Bay are used for intensive residential, industrial, and commercial development, including the urban areas of Warwick, Providence, Bristol, Fall River, and Tiverton. The former Navy base at Quonset/Davisville (3 miles west of northern Prudence and Patience Islands, and 1.5 miles from Hope Island) is being redeveloped as a major industrial area. It houses the main support base for outer continental shelf oil and gas exploration in the Mid and North Atlantic areas. The existing airport at Quonset/Davisville is being expanded, and its flight path passes directly over Hope Island.

Narragansett Bay itself supports extensive commercial shipping, sport and commercial fishing, and recreational boating.

a. Commercial Shipping

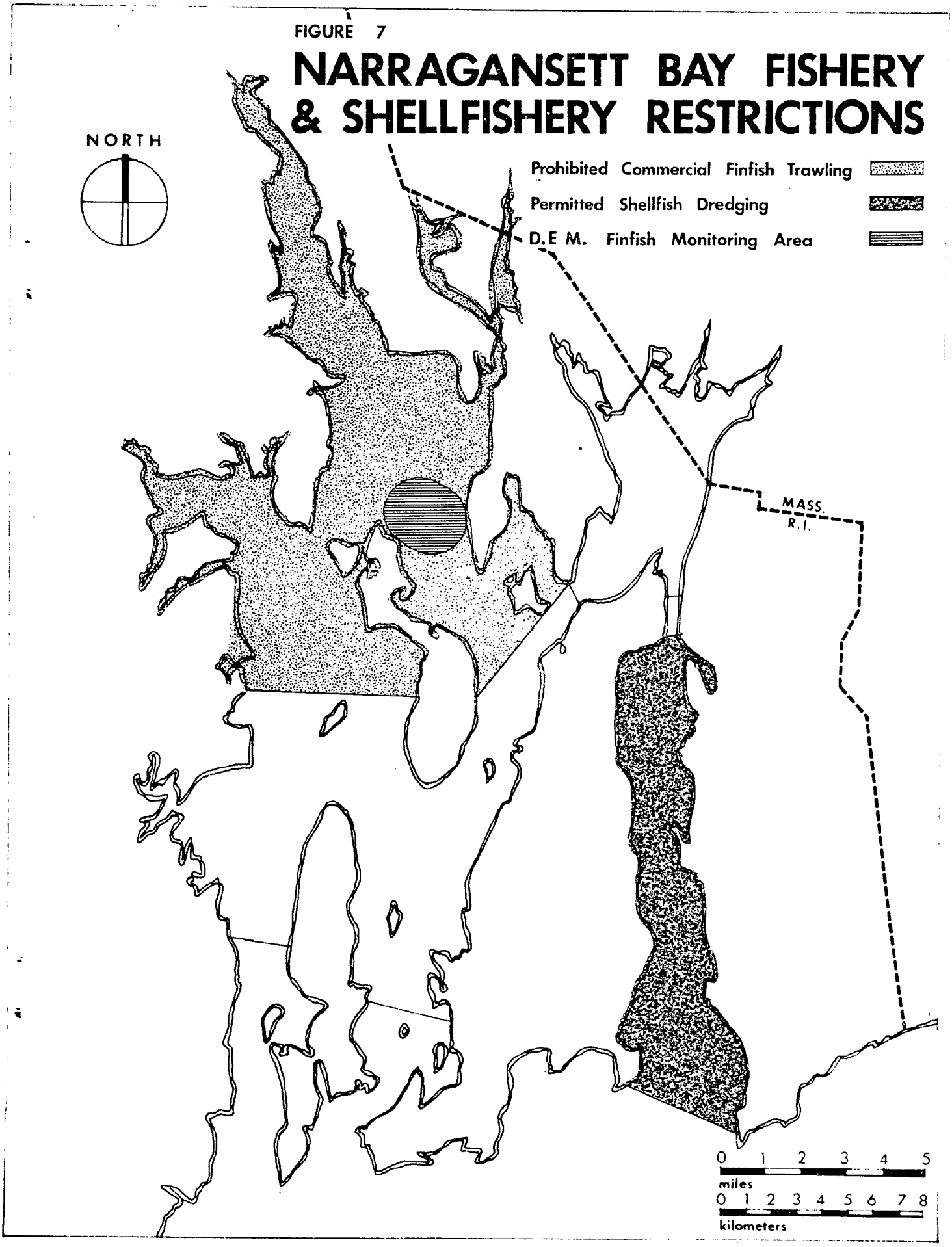
Passages between the islands of Narragansett Bay are sufficiently deep to permit the navigation of large ships. Channel dredging is necessary only at the mouth of the Providence and Taunton Rivers. Major ports in Narragansett Bay are Providence and East Providence at the head of the Bay, and Fall River and Tiverton in Mount Hope Bay. The value of the imports passing through the Bay in 1975 was more than $1 billion, with petroleum products the major import. The principal shipping channel to these four ports passes 1.5 miles to the east of North Prudence Island.

b. Commercial and Sport Fishing

The Bay supports a rich sport fishery. The main sportfish catches are striped bass, bluefish, winter flounder, and tautog. With the exception of two commercial menhaden seining vessels, there is no commercial finfishing in the vicinity of the proposed sanctuary. Limited commercial trawling takes place in the Bay to the south of the proposed sanctuary (See Fig. 7).

FIGURE 7

NARRAGANSETT BAY FISHERY & SHELLFISHERY RESTRICTIONS



By far the most important commercial fishery in the Bay is for quahogs, or hard-shell clams. The Upper Bay contains some of the most productive quahog beds in the Bay. Total catch in 1978 was 2 million pounds, valued at $4.3 million. There are currently 300 full-time and 1,600 part-time quahoggers working the Bay. This fishery has been affected by water quality problems in the Upper Bay, which have resulted in permanent or conditional closure of significant portions of the potential shellfishing area.

c. Recreational Boating

There are about 28,000 recreational boats registered in Rhode Island in 1980, many of which are used in the Bay, as well as numerous boats from adjoining states. There are 50 private and 49 public boating facilities in Narragansett Bay or its tributaries. Recreational boating use is heavy in all parts of the Bay, while Newport, at the mouth of the Bay, is a center for international boating events such as the America's Cup races and the Newport-Bermuda race.

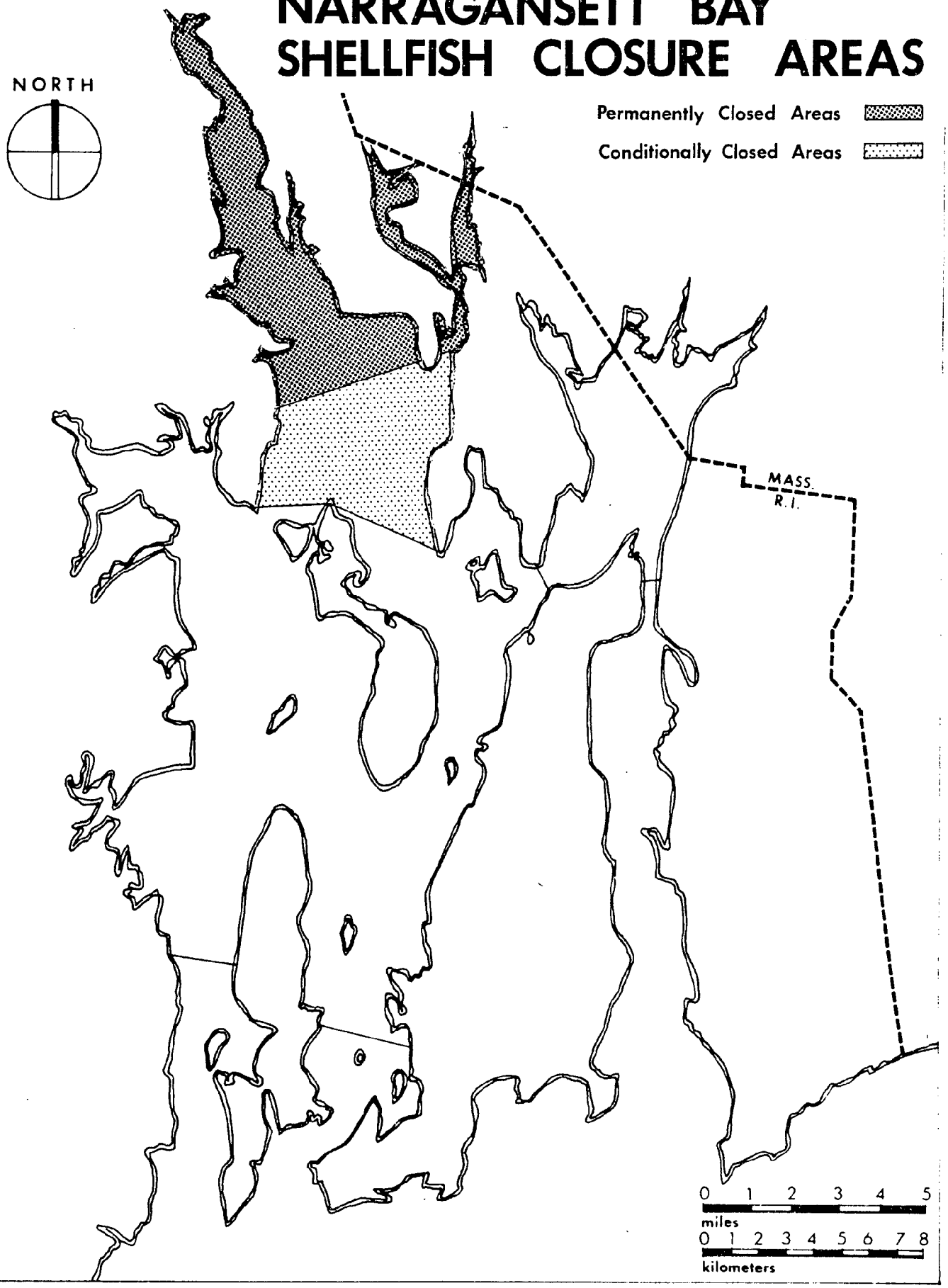
4. Water Quality

Water quality in most of Narragansett Bay is excellent, with 92 percent of the Bay classified as SA (highest) or SB (second highest). The main exception is the Upper Bay, whose waters are polluted by inadequately treated sewage from Providence, and combined sewer overflows from Providence, Pawtucket, and Central Falls during storms. Waters from the Providence River south to Gaspee Point are classified as SC, while the waters south from there to a line drawn connecting Rocky Point and Rumstick Point are classified as SB. North of this line, the Bay is permanently closed to shellfishing; south of this line to a line connecting Warwick Point, Providence Point on the northern tip of Prudence Island and Popasquash Point, the waters are conditionally open for shellfishing, except that this conditional area is closed whenever rainfall of more than 0.5 inches occurs during any 24-hour period (See Fig. 8).

Thus, the proposed estuarine sanctuary is just south of the transitional water quality zone in Narragansett Bay. The waters to the east, west, and south are classified SA (except Potter Cove on northern Prudence, which is classified SB during the summer because of pollution from the recreational boats anchoring there), while those to the north are classified SB.

FIGURE 8

NARRAGANSETT BAY SHELLFISH CLOSURE AREAS



5. Land Use

Of Prudence Island's 3,490 acres, about 1,327 acres on the northern and southern ends of the island are owned by the State, while the remaining 2,163 acres are in private ownership. Within the 737 acres on northern Prudence Island proposed for inclusion in the estuarine sanctuary, there are two privately owned parcels, amounting to 34 acres. Several hundred private homes are located along the eastern shore of central Prudence, while the interior of the island is generally divided into larger parcels of 100-300 acres. One 300-acre parcel is owned by the Heritage Foundation of Rhode Island, and protected for use and enjoyment by the general public. Hunting is not permitted on the Heritage Foundation land. Prudence has a year-round population of about 50, while the summer population is about 1,000. Many people have winterized their summer homes, and now use them on weekends throughout the year, or rent them to hunters during the hunting season.

All of Patience Island, except for 2 houses and 4 surrounding acres, is proposed to be purchased for inclusion in the estuarine sanctuary. The two private owners will continue to use their homes primarily in the summer and during the hunting seasons.

All of Hope Island is owned by the State, and the entire island is proposed to be included in the estuarine sanctuary.

PART V: LIST OF PREPARERS

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Mr. O'Neill has a B.A. in Earth Sciences, and is now an environmental analyst with the Estuarine Sanctuaries Program in NOAA's Office of Coastal Zone Management. Mr. O'Neill has worked on coastal energy and planning projects for the New England River Basins Commission, the Governor's Office of Planning and Research in California, the Resources Agency of California, and the California Coastal Commission. In 1975, Mr. O'Neill prepared Draft and Final Environmental Impact Statements for the Sapelo Island Estuarine Sanctuary in Georgia.

Mr. O'Neill prepared this document on the basis of materials provided by the State of Rhode Island, and with the assistance of Mr. James W. MacFarland, Program Manager, Mr. Frank D. Christhilf, Project Manager, Mr. Richard Weinstein, Writer/ Editor, and Mrs. Gloria D. Thompson, Program Support, of the Estuarine Sanctuary Program in the Office of Coastal Zone Management.

Judith S. Benedict -- Rhode Island Department of Environmental Management

Ms. Benedict has a B.A. in History and a Masters degree in City Planning. She is a planner with the Rhode Island Department of Environmental Management, and is currently preparing the management plan for the Bay Islands Park. Ms. Benedict has worked as a planner for the City of Ithaca, New York, and the Heritage Conservation and Recreation Service in Washington, D.C., and on coastal management issues for the national office of the League of Women Voters in Washington, D.C.

Ms. Benedict prepared most of the material for this document, with the assistance of Mr. Robert L. Bendick, Assistant Director for Administration, Mr. Victor A. Bell, Environmental Planner, and Mr. Donald Leighton, Landscape Architect, of Rhode Island's Department of Environmental Management; Mr. Richard Enser of the Rhode Island Heritage Program, Mr. Stephen Olsen of the University of Rhode Island's Coastal Resources Center, and Mr. Prentiss Stout of the URI Sea Grant Marine Advisory Service.

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

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
Department of Commerce
Department of Defense
Department of Energy
Department of Health, Education & Welfare
Department of Housing & Urban Development
Department of the Interior
Department of Justice
Department of Labor
Department of Transportation
  U.S. Coast Guard
Environmental Protection Agency
Federal Energy Regulatory Commission
General Services Administration
Marine Mammal Commission
Naval Battalion Construction Center
Naval Underwater System Center
Naval War College
Nuclear Regulatory Commission

National Interest Groups

A.M.E.R.I.C.A.N.
AFL-CIO
American Association of Port Authorities
American Bureau of Shipping
American Farm Bureau Federation
American Fisheries Society
American Gas Association
American Industrial Development Council
American Institute of Architects
American Petroleum Institute
American Shore and Beach Preservation Association
American Society of Civil Engineers
American Society of Landscape Architects, Inc.
American Society of Planning Officials
American Waterways Operators
Amoco Production Company
Atlantic Richfield Company
Atomic Industrial Forum
Boating Industry Association
Bultema Dock & Dredge Company

Center for Law and Social Policy
Center for Natural Areas
Center for Urban Affairs
Center for Urban & Regional Resources
Chamber of Commerce of the United States
Chevron U.S.A., Inc.
Cities Service Company
Coast Alliance
Conservation Foundation
Continental Oil Company
Council of State Planning Agencies
The Cousteau Society
CZM Newsletter
Edison Electric Institute
El Paso Natural Gas Co.
Environmental Policy Center
Environmental Defense Fund, Inc.
Environmental Law Institute
EXXON Company, U.S.A.
Friends of the Earth
Great Lakes Basin Commission
Gulf Energy and Minerals, U.S.
Gulf Oil Company
Gulf Refining Company
Industrial Union of Marine & Shipbuilding
  Workers of America
Institute for the Human Environment
Interstate Natural Gas Association of America
Lake Michigan Federation
Marathon Oil Company
Marine Technology Society
Mobil Oil Corporation
Mobil Exploration & Producing, Inc.
Murphy Oil Company
National Association of Conservation Districts
National Association of Counties
National Association of Home Builders
National Association of Realtors
National Audubon Society
National Coalition for Marine Conservation, Inc.
National Farmers Union
National Federation of Fisherman
National Fisheries Institute
National Forest Products Association
National Marine Manufacturers Association
National Ocean Industries Association
National Parks and Conservation Association
National Recreation and Park Association
National Research Council

National Society of Professional Engineers
National Waterways Conference
National Wildlife Federation
Natural Resources Defense Council
Natural Resources Law Institute
The Nature Conservancy
Norfolk Dredging Company
Outboard Marine Corporation
Resources for the Future
Rose, Schmidt & Dixon
Shell Oil Company
Sierra Club
Skelly Oil Company
Soil Conservation Society of America
Sport Fishing Institute
Standard Oil Company of Ohio
State University Law School
State University of New York
Sun Company, Inc.
Tenneco Oil Company
Texaco, Inc.
Texas A & M University
Union Oil Company of California
University of Pittsburgh
Urban Research and Development Association, Inc.
Western Oil and Gas Association
Wildlife Management Institute
The Wildlife Society
Woods Hole Oceanographic Institute

Congressional

Honorable E. P. Beard
Honorable John H. Chafee
Honorable F. J. St. Germain
Honorable Claiborne Pell

State Agencies

Coalition of Coastal Commission
Department of Economic Development
Department of Environmental Management, Director for Operations
Department of Environmental Management, Fish and Wildlife
Department of Environmental Management, Water Quality
Department of Health, Division of Food Protection
Department of Transportation
Division of Agriculture

Division of Boating Safety
Division of Coastal Resources
Division of Enforcement
Division of Fish and Wildife
Division of Parks and Recreation
Governor's Office
New England River Basin Commission
Rhode Island Coastal Resources Management Council
Statewide Planning Program
Town Administrator

Local Interest Groups

Aquidneck Island Ecology
Audubon Society of Rhode Island
Conservation Law Foundation
League of Women Voters of Rhode Island
Newport Daily News
Portsmouth Free Library Association
Providence Journal Bulletin
Providence Public Library
Rhode Island Association of Conservation Districts
Rhode Island Heritage Program
Rhode Island Historical Preservation Commission
Rhode Island Lobstermen's Association
Rhode Island Lung Association
Save The Bay, Inc.

Individuals

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George Ernst
Captain Thomas W. Lyons, Jr.
Frank Melone
Dennis Nixon
Richard Poirier
Spencer W. Potter
Grafton Rice
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Dr. Walter Gould, URI
Dr. Paul Hargraves, URI
Dr. Richard Hull, URI
Dr. Perry Jeffries, URI
Dr. Donald E. Leary, Providence College
Mr. Steven Leslie, St. Georges School
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Mr. Neil Ross, URI
Mr. Lewis Royal, Rhode Island Junior College
Mr. John Siebueth, URI
Dr. Ted Smayda, URI
Mr. Prentiss Stout, URI
University of Rhode Island Library, Main Campus
Dr. Jon Waage, Brown University

PART VII: APPENDICES

I. Estuarine Sanctuary Guidelines

II. Bay Island Park System

III. Rhode Island Water Quality Standards

IV. Educational Programs for the Proposed Estuarine Sanctuary

APPENDIX I

Estuarine Sanctuary Guidelines, 1974 and 1977

necessary to the objectives of the grant project. As used herein the terms "cost" and "grant project" pertain to both the Federal grant and the matching share. The allowability of cost will be determined in accordance with the provisions of FMC 74-4: Cost Principles applicable to Grants and Contracts with State and Local Governments, and with the guidance contained in section 920 42(b)(3).

(f) The Form SF-424, Application for Federal Assistance (Non-Construction Programs), constitutes the formal application and must be submitted 60 days prior to the desired grant beginning date. The application must be accompanied by evidence of compliance with A-95 requirements including the resolution of any problems raised by the proposed project. The Associate Administrator will not accept application substantially deficient in adherence to A-95 requirements.

(g) In Part IV, Program Narrative of the Form SF-424, the applicant should repond to the following requirements:

(1) Set forth a work program describing the activities to be undertaken during the grant period. This work program shall include:

(i) A precise description of each major task to be undertaken to resolve section 306 deficiencies, and a specific timetable for remedying these deficiencies;

(ii) A precise description of implementation activities for approved management components, including a demonstration that these implementation funds will not be applied outside the approved coastal management boundaries;

(iii) A precise description of any other tasks necessary for and allowable under subsection 305(d);

(iv) For each task, identify any "Other Entities," as defined in the "Manual," that will be allocated responsibility for carrying out all or portions of the task, and indicate the estimated cost of the subcontract for each allocation. Identify, if any, that portion of the task that will be carried out under contract with consultants and indicate the estimated cost of such contract(s); and

(v) For each task, indicate the estimated total cost. Also, indicate the estimated total months of effort, if any, allocated to the task from the applicant's staff.

(2) The sum of all task costs in the above paragraph should equal the total estimated grant project cost.

(3) Using two categories, Professional and Clerical, indicate the total number of personnel in each category on the applicant's staff that will be assigned to the grant project. Also indicate the number assigned full time and the number assigned less than full time in the two categories. Additionally, indicate the number of new positions created in the two categories as a result of the grant project.

PART 921—ESTUARINE SANCTUARY GUIDELINES

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 initial acquisition, development and operation grants.
921.12 Application for subsequent development and operation grants.
921.13 Federally owned lands.
921.14 Application time schedule and procedure.

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. 312, Pub. L. 92-583, as amended; 86 Stat. 1280 (16 USC 1461).

SOURCE: 39 FR 19924, June 4, 1974, unless otherwise noted.

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 unimpaired 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, ma-

nipulative 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 minitor 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.

§ 921.14 Application time schedule and procedure.

(a) Effective January 1, 1975, the review and selection of estuarine sanctuary applications will be conducted on a twice yearly basis. All applications received between January 1 and June 30 of any year will be considered together beginning July 1 of that year; applications received between July 1 and December 31 will be considered together beginning January 1 of the following year.

(b) All applications received during any application period will be subject to simultaneous review and consideration. At the end of each application period, a suitable number of applications, based on the level of funding available, will be selected for further review and processing. Unless sufficiently distinguished as major subcategories, no more than one application from each biogeographic category will be selected for final processing during each review period. Normally, the applications selected will be processed and the grants awarded within 6 months from the end of the application period, that is before the next review period begins. Applications which are not selected for processing may be resubmitted for consideration during the next review period.

(c) At least ninety (90) days prior to submission of an application under this section, an applicant state must notify in writing the OCZM, appropriate state and regional A-95 clearinghouses, and other states within the same biogeographic category (see Table 1) of its intention to file an application for an estuarine sanctuary grant. Such notification should include at least the identification of the state agency applying for the grant; the geographic location of the proposed sanctuary and its boundaries; proposed objectives of the sanctuary, including intended research uses; estimated cost of sanctuary; and estimated date for submission of application. Copies of the A-95 notifications to the state and regional clearinghouse would be considered sufficient and desirable notification to OCZM and to the other states.

TABLE 1—LIST OF STATES BY BIOGEOGRAPHIC CLASSIFICATION

1. Acadian—Maine, New Hampshire, Massachusetts.

2. Virginian—Massachusetts, Rhode Island, Connecticut, New York, New Jersey.

Delaware, Maryland, Virginia, North Carolina.

3. Carolinian—North Carolina, South Carolina, Georgia, Florida.

4. West Indian—Florida, Puerto Rico, Virgin Islands.

5. Louisianian—Florida, Mississippi, Alabama.

6. Californian—California.

7. Columbian—California, Oregon, Washington.

8. Fiord—Alaska.

9. Sub-Arctic—Alaska.

10. Insular—Hawaii, Guam, American Samoa.

11. Great Lakes—Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, New York.

(d) The Director of OCZM may, upon the finding of extenuating circumstances relating to applications for assistance, waive appropriate administrative requirements contained herein.

[39 FR 45214, Dec. 31, 1974]

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.

PART 922—MARINE SANCTUARIES

Subpart A—General

Sec.
922.1 Policy and objectives.
922.2 Programmatic objectives.

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.

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APPENDIX II

Bay Island Park System

Although the idea of a Bay Islands Park has been discussed for more than a decade, the Park received its first official recognition with the appearance in 1976 of The Bay Islands Park: A Marine Recreation Plan for the State of Rhode Island, prepared by the University of Rhode Island's Coastal Resources Center and the Department of Environmental Management. This report created a conceptual framework for the Park's development, and recommended that the State acquire several key parcels. Since then, Rhode Island has acquired 624 acres on southern Prudence Island and 186 acres at Beavertail from the U.S. Department of the Interior's Heritage Conservation and Recreation Service, has purchased or received through donation more than 700 acres on northern Prudence Island, and hopes to purchase Patience Island later in 1980.

By the fall of 1980, then, Rhode Island will own 2,185 acres on six islands in Narragansett Bay. The sites, their acreage, and their current status are listed in the following chart:

Site	Island Location	Acreage	Current Status
Southern Prudence	Prudence Island	624	Park Planning
Northern Prudence	Prudence Island	728	Park Planning; Management Area
Patience	Patience Island	207	To Be Acquired
Hope	Hope Island	94	Park; Management Area
Fort Adams	Aquidneck Island	132	Master Plan Complete; Development Underway; Completion Date 1985
Brenton Point	Aquidneck Island	53	State Park
Fort Wetherill	Conanicut Island	51	State Park
Beavertail	Conanicut Island	186	Master Plan Complete; Development Underway; Completion Date 1985
Dutch	Dutch Island	110	Park Planning; Management Area

These nine sites vary considerably in both natural character and the cultural legacy reflecting past human use of each island. Development of the Park will emphasize and enhance that variety, so that within the Park people can experience a wide range of recreational and cultural opportunities: historic fortifications at Fort Adams, open ocean coastline at Brenton Point, Fort Wetherill and Beavertail, or the solitude and wildlife of northern Prudence, Patience, and Hope Islands.

Four of the sites -- Fort Adams, Fort Wetherill, Brenton Point, and Beavertail -- can be reached by car, and are already completed parks or under development. Public transportation will be provided to the other five sites, which can only be reached by boat. Current plans call for a ferry system that will link southern Prudence to Providence, Newport, North Kingstown, and Portsmouth. Transportation to Patience and Hope Islands will be provided from southern Prudence, and Dutch Island will be accessible from Jamestown (Fort Getty).

The chart on the following page indicates the activities proposed for each site. Solid black circles indicate activities which will be permitted at each site. Partially filled circles indicate activities for which decisions are pending. The absence of a circle signifies that the activity will not be permitted at that site. Southern Prudence, as the center for the Park and the proposed estuarine sanctuary, is expected to have the greatest number of visitors and the broadest range of activities. Northern Prudence, Patience, and Hope Islands, which would constitute the proposed estuarine sanctuary, will have fewer visitors, and the major activities will be interpretative education programs.

BAY ISLANDS PARK SITES

PROPOSED ACTIVITIES	South Prudence	North Prudence	Patience	Hope	Dutch	Gould	Beavertail	Ft. Wetherill*	Ft. Adams*	Brenton Pt.*
Picnicking (Tables)	●	◕			◐		●	●	●	●
Tent Camping	●		◔		◕					
Group Camping	◐		●							
Hostel	●									
Hiking	●	●	●		●		●	●	●	●
Birdwatching	●	●	●	●	●	●	●	●	●	●
Swimming	◕	◕	◕						●	
Skin Diving					◐		●	●		●
Scuba Diving					◕		●	●		●
Bicycling	●						●			
Fishing	●	●	●		●		●	●	●	●
Boat Rental										
Open Space (Informal Field)	●		●						●	●
Env. Education	◕	●		●	●		●		●	●
Historical Interpretation		●			●				●	
Scientific Research		●	●	●						
SUPPORT SERVICES										
Infor. Center	●	●			◕		●		●	●
Restrooms	●	●	●		◕		●	●	●	●
Trash Pickup	◕						●	●	●	●
Communications	●									
Resident Caretaker	●	●			◕				●	
Private Boat Access	◕	●	●		●				●	
Camp Store	◕								●	

*Existing Activities

APPENDIX III

Rhode Island Water Quality Standards

Rhode Island Water Quality Standards -- Sea Water

Criterion	Class SA/SAm	Class SB	Class SC
1. Dissolved oxygen	Not less than 6.0 mg/l at any time.	Not less than 5.0 mg/l at any time.	Not less than 5mg/l during at least 16 hours of any 24-hour period for less than 4 mg/l at any time.
2. Sludge deposits-solid refuse-floating solids-oils-grease-scum	None allowable	None allowable	None except that amount that may result from the discharge from a waste treatment facility providing appropriate treatment.
3. Color and turbidity	None in such concentrations that would impair any usages specifically assigned to this Class.	None in such concentrations that would impair any usages specifically assigned to this Class.	None in such concentrations that would impair any usages specifically assigned to this Class.
4. Coliform bacteria per 100 ml	Not to exceed a median MPN of 70 and not more than 10% of the samples shall ordinarily exceed an MPN of 230 for a 5-tube decimal dilution or 330 for a 3-tube decimal dilution.	Not to exceed a median value of 700 and not more than 2300 in more than 10% of the samples.	None in such concentrations that would impair any usages specifically assigned to this Class.
5. Fecal coliform bacteria/100 ml	A median of 15 per 100 ml in not more than 10% of the samples exceeding 50 per 100 ml.*	A median value of 50 per 100 ml and not more than 500 per 100 ml in 10% of the samples collected.*	

*Guide, pending further research.

Rhode Island Water Quality Standards -- Sea Water

Criterion	Class SA/SAm	Class SB	Class SC
6. Taste and odor	None allowable	None in such concentrations that would impair any usages specifically assigned to this Class and none that would cause taste and odor in edible fish or shellfish.	None in such concentrations that would impair any usages specifically assigned to this Class and none that would cause taste and odor in edible fish or shellfish.
7. pH	6.8 - 8.5	6.8 - 8.5	6.5 - 8.5
8. Temperature increase:	None except where the increase will not exceed the recommended limit on the most sensitive receiving water use and in no case exceed 83 degrees F or in any case raise the normal temperature more than 1.5 degrees F, 15 June through September and not more than 4 degrees F from October through 15 June. All measurements shall be made at the boundary of such mixing zones as is found to be reasonable by the Director.		
9. Chemical constituents	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, impair the palatability of same, or impair the waters for any other uses.	None in concentrations of combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, or impair the water for any other usage assigned to this Class.	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, or impair the water for any other usage assigned to this Class.

APPENDIX IV

Educational Programs for the Proposed Estuarine Sanctuary

Educational Programs for the Proposed Estuarine Sanctuary
(Prepared by the State of Rhode Island)

Rhode Island students have a strong marine awareness, accomplished through the efforts of individual teachers, assisted by the Marine Education Specialist at the University of Rhode Island's Marine Advisory Service. Almost every school in Rhode Island has had at least one lecture sponsored by the Rhode Island Coastal Resources Management Council and managed by the Marine Advisory Service. During various workshops and field days, many Rhode Island teachers have been instructed on methods of incorporating the marine world into their teaching. A genuine interest is present, and in view of the growing number of inquiries from the Rhode Island educational community, we anticipate a continuing strong interest in the marine world.

Establishment of the proposed sanctuary would significantly increase public understanding of estuarine processes and the vital influence of Narragansett Bay on the Ocean State's residents. In the total view of education, few sites exist where the users can have actual field experiences. Field trips can be as valuable as classroom work, but are often foregone due to a lack of suitable sites, as well as teacher concerns about taking students on field trips. Some sites within the proposed estuarine sanctuary and Bay Islands Park system are admirably suited to field trips.

Historically, school field trips for younger students have had little standing within the educational process, so that as budgets become strained these are among the first "extras" to be deleted from the curriculum. Further deletions result from rising fuel costs and bus expenses. However, the proposed estuarine sanctuary and Bay Island Park system can reverse this situation. Almost 60% of the State's 178,000 school-age children live within 15 miles of Providence. The proposed access to some of the island sites by ferry could cut travel costs significantly.

Uses of selected sites in the sanctuary and Park system would include traditional and innovative study programs. Traditional programs would include beach field trips, marsh studies, and intertidal biology. With marine studies already in place in Rhode Island schools, there is little doubt that the Park and sanctuary sites would be used. Innovative programs would include total immersion programs permitting students to spend longer periods of time on-site in study programs that would complement existing school programs. Other programs could include two-week summer programs offered at various island sites. Given the multi-disciplinary nature of marine studies, few traditional courses taught in today's school system are entirely without applicability to marine studies.

Narragansett Bay's marine environment has, and will continue to play, an important role in Rhode Island's historical perspective. The advent of the proposed sanctuary and Park system can add a new and exciting role to the Ocean State's educational goals. By using these sites, Rhode Island students can gain a better understanding of the role of water in the functioning of the State.

Year-round programs should be considered. Schools are traditionally closed during the warmer months. The climate of Rhode Island, though, does allow extension of a school study season well into December, and the season could be resumed in the middle of March. School-oriented sites could accomodate students from September until mid-December, and from mid-March until June. Summer programs should also be considered.

There are case studies in trhe Northeast to support such year-round educational programs. The joint effort between the Greater Providence YMCA and the University of Rhode Island's Marine Advisory Service, called SEASCOPE, is such a program. Starting in March 1980 at the YMCA's Camp Fuller on Point Judith Pond, this program will introduce Rhode Island students to the world of salt water. Project Oceanology at Avery Point in Groton, Connecticut also runs continuous marine programs throughout the year. Massachusetts, Maine and New Hampshire have similar programs.

With regard to curriculum development and availability, there is a vast array of materials. The Marine Awareness Center at the Bay Campus of the University of Rhode Island houses the largest collection of marine study materials in the United States.

If Rhode Island is truly to be the Ocean State, its students must learn and understand as much as they can about the marine environment. The proposed Estuarine Sanctuary and Bay Islands Park system can play a vital role in this important educational process.

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