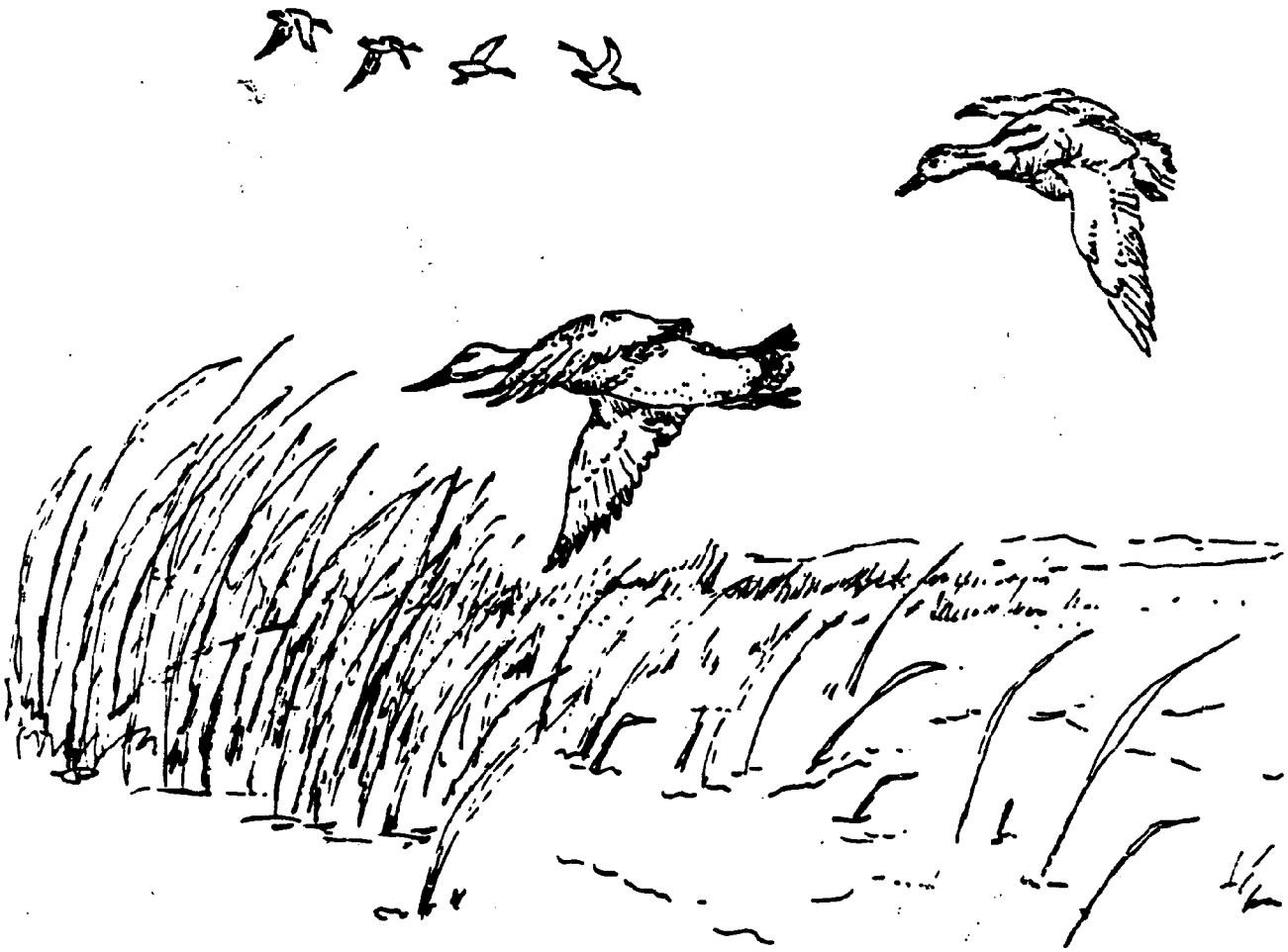
WELLS
NATIONAL ESTUARINE SANCTUARY
Final Management Plan



April 1985

WELLS NATIONAL ESTUARINE SANCTUARY

Final Management Plan

Prepared by the
Southern Maine Regional Planning Commission

Revised and Edited by the
Maine State Planning Office

April, 1985

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Wells National Estuarine Sanctuary was established in 1984 to provide long-term estuarine research, education and interpretation opportunities. The Sanctuary provides students, researchers, and the general public an opportunity to learn about natural and human processes within an estuarine area. It was established pursuant to Section 315 of the Coastal Zone Management Act of 1972, as amended and is supported by the National Oceanic & Atmospheric Administration (NOAA), U.S. Fish & Wildlife Service, the State of Maine, and the Town of Wells.

The Sanctuary is comprised of approximately 1,500 acres of wetland and undeveloped upland in the Webhannet and Little River estuaries of southern Maine. (See Figure 1) The land within the Sanctuary is owned by three levels of government; all of which have entered into cooperative agreements for the joint management of their holdings as a National Estuarine Sanctuary. (See Figure 2).

The goals for the Wells National Estuarine Sanctuary cover the range of multiple uses envisioned in Section 315 of the Coastal Zone Management Act and its implementing regulations. The primary goals for managing the Sanctuary are:

A. To manage the Wells National Estuarine Sanctuary as a natural field laboratory and educational site. This includes the protection of the estuaries, transitional areas, and adjacent uplands and the use of these areas for short and long-term estuarine research, education, and interpretation.

B. To protect fish, wildlife, and plant communities, and to prevent activities detrimental to migratory waterfowl and other wildlife communities, particularly endangered and threatened species.

C. To promote the cooperative management by Federal, State and municipal agencies of the Webhannet and Little River estuaries.

D. To allow for multiple uses of the Sanctuary, including the continuation of existing low intensity recreational uses, and activities related to fish and wildlife uses (e.g. hunting, fishing, wildlife observation), which are compatible with the Sanctuary's character as a natural field laboratory and educational site.

E. To develop and operate a low intensity recreational facility in Laudholm State Park. This facility may offer activities such as parking, interpretive trails, a boardwalk, beach access, swimming, picnicking and sanitary facilities. These facilities shall be established in a manner which protects the natural resources of the Little River estuary and furthers the public education and interpretive aspects of the Sanctuary.

The activities relating to the use and protection of the Sanctuary's resources are summarized as:

Research - This management plan broadly describes the types of research activities that are encouraged within the Sanctuary. The intent of these activities are to provide information to researchers, coastal resource managers, and the general public so that coastal management decisions may be based on sound scientific research.

Educational and Interpretive - The Sanctuary provides publications, lectures, slide shows, field trips, courses, and other related programs on the Webhannet and Little River estuarine areas. These activities are coordinated with public/private schools, colleges and universities, museums, and other organizations involved in educational activities.

Other - This plan explicitly allows for secondary, multiple uses of the Sanctuary provided they are compatible with the goals of the Sanctuary. These uses include the operation of a low intensity recreational area and continued management of the Rachel Carson Wildlife Refuge. These uses are provided for by cooperative agreements which are contained in Appendix 1 and 2.

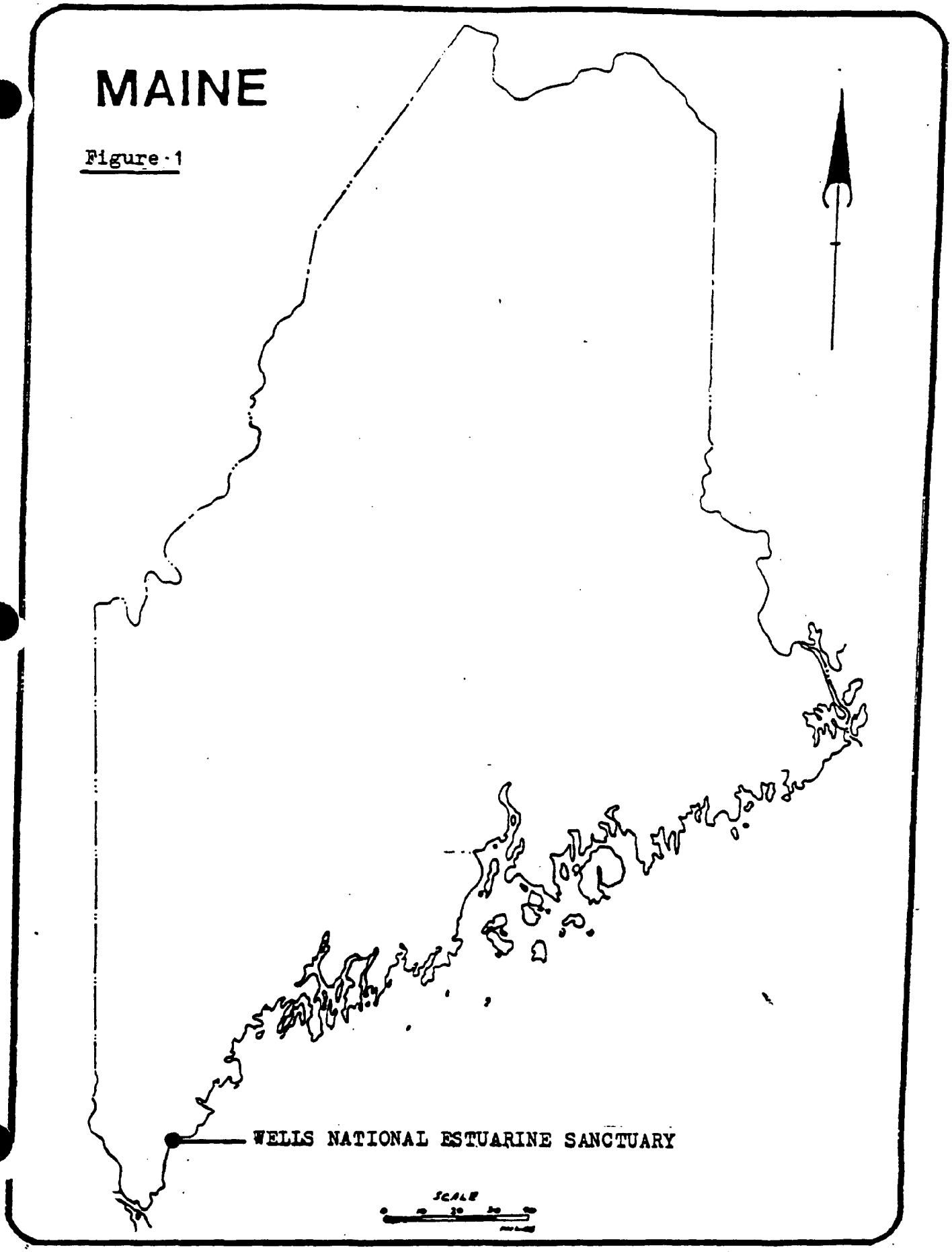


Figure 1

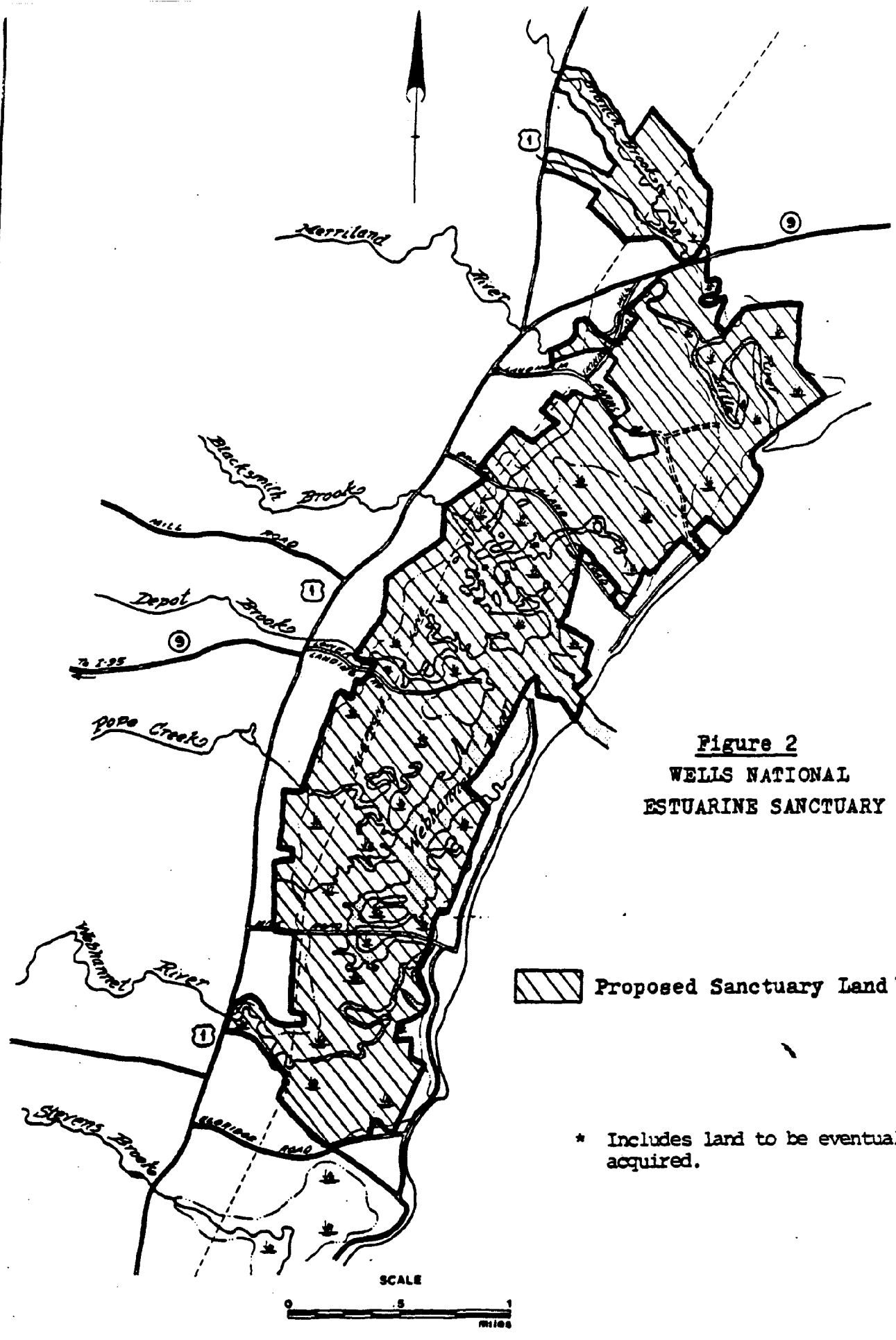


Figure 2
WELLS NATIONAL
ESTUARINE SANCTUARY

Proposed Sanctuary Land *

* Includes land to be eventually acquired.

HISTORICAL BACKGROUND

HISTORICAL BACKGROUND

The Wells National Estuarine Sanctuary is part of the National Estuarine Sanctuary system that is supported by the U.S. Department of Commerce's National Oceanic & Atmospheric Administration. Section 315 of the Coastal Zone Management Act created the National Estuarine Sanctuary Program to provide states with 50 percent matching grants for acquiring, developing, and operating areas "to serve as natural field laboratories in which to study and gather data on the natural and human processes occurring within the estuaries of the coastal zone." In addition to supporting estuarine research these sanctuaries provide students and the general public with estuarine areas where they can learn about natural processes in the coastal region and cultural effects on them. Other uses of the sanctuaries are allowed provided they do not conflict with the goals of the Sanctuary.

Congress established the National Estuarine Sanctuary Program in response to disturbing trends appearing in coastal areas throughout the country -- namely, the pollution of coastal waters, the closing of shellfish beds, the draining of marshes, and other human-induced damages to valuable and productive estuarine ecosystems. Fewer and fewer undisturbed estuarine areas remain available for scientific study and public education. At the same time, the need is growing for better information about the functions and processes of estuarine ecosystems, cultural effects on them, and ways to improve management decisions in the nation's coastal areas.

The establishment of the Wells National Estuarine Sanctuary (herein after Sanctuary) in 1984 culminated decades of Federal, State and local efforts to preserve two of the most accessible, productive and scenic estuarine areas in the Northeast.

Between 1930, when Maine undertook its first Statewide planning effort, and 1980, when the Maine State Planning Office solicited nominations for an estuarine sanctuary, the Webhannet to Mousam River estuarine system has been recognized as an important natural resource. The first initiatives to preserve and manage this area were undertaken by the U.S. Fish & Wildlife Service, through the establishment of the Rachel Carson National Wildlife Refuge, in 1966. In 1969 the Maine Department of Conservation purchased land north of the Refuge for the development of a low intensity State Park.

The impetus for preserving this area as a natural field laboratory came in 1980 when the Maine State Planning Office determined the area was the most suitable in the State as a National Estuarine Sanctuary. In close cooperation with the State, the Town of Wells voted overwhelmingly to support and operate the Sanctuary. The Town, through the Laudholm Trust, was successful in privately raising the funds necessary to match federal acquisition and development funds. Governor Joseph E. Brennan also made a sizeable State commitment making this Sanctuary a cooperative State/local initiative.

PURPOSE

PURPOSE

This Wells National Estuarine Sanctuary Management Plan describes how the Sanctuary can be used by researchers, educators/interpretive naturalists, students, recreationists, and the general public. The Plan provides background information, sets goals and objectives for the protection and use of the Sanctuary's resources and outlines management strategies to be implemented to achieve these goals.

The Wells National Estuarine Sanctuary is a unique combination of lands and waters that were set aside as undisturbed areas for:

- researchers to study how the estuarine system and its various resources function;
- students and the general public to learn about the estuarine environment, develop an appreciation of its value as a natural resource, and understand the impact of human actions on this natural system; and
- people to enjoy traditional recreational activities, such as hunting, fishing, and wildlife observation that depend on and co-exist peacefully with the abundance of estuarine resources.

SECTION I:
SANCTUARY RESOURCES

SANCTUARY RESOURCES

Contained within the Wells National Estuarine Sanctuary are two categories of resources -- Natural and Cultural.

NATURAL

Physiography

Wells Bay is a shallow, sandy basin stretching for about ten miles along the York County coast between the rocky headlands at the mouth of the Ogunquit River north to the Kennebunk River. While there are sub-beach systems formed by tidal reentrants at the Webhannet, Little and Mousam Rivers, the entire stretch of shoreline with the exception of Moody Point and Great Hill is comprised of sand beach.

The Webhannet and Little Rivers, which form the two estuaries within the Sanctuary, rise in the sandy glacial outwash plain about eight miles inland in Wells and Sanford. Freshwater runoff from these rivers into the estuaries is moderate to low especially in the summer, because of their relatively small drainage area (about 40 square miles combined) and deep glacial deposits which retain precipitation. In addition, the Kennebunk - Kennebunkport and Wells Water District withdraws about 3 million gallons of water per day from a tributary of the Little River for public water supply further reducing the flow. Consequently, the estuaries have a low flushing rate, especially in their upper reaches.

The Sanctuary contains about 1,300 acres of tidal wetland, which represent the majority of undeveloped marsh transition and upland zones in the area. The extensive marsh system and the large area of undeveloped upland field and forest represents a unique habitat to this area of the State which attracts and supports an abundance of resident and migratory wildlife.

The Sanctuary site is physically typical of the southern half of the Acadian biogeographic region, which extends from Calais, Maine to Cape Cod, (See Figure 3) with its low relief, extensive marsh and beach system. The Sanctuary is unique, however, for its diversity and abundance of flora and fauna. The combination of natural features and diverse biota make the area particularly valuable and useful for research and educational/interpretive activities.

Climate

The climate of Maine is noted for its variability, both daily and annually. The subclimate of the Sanctuary area is more moderate than the rest of the State because of its southerly location and prevailing southwesterly winds. Precipitation averages 42 inches per year, with about half that amount lost as annual runoff. Average annual temperature is 46° F, with an average range of 68° in July to 21° in January. Fog is common in the Sanctuary during July and August, though the area receives in excess of 60% of the available sunlight on an annual average.

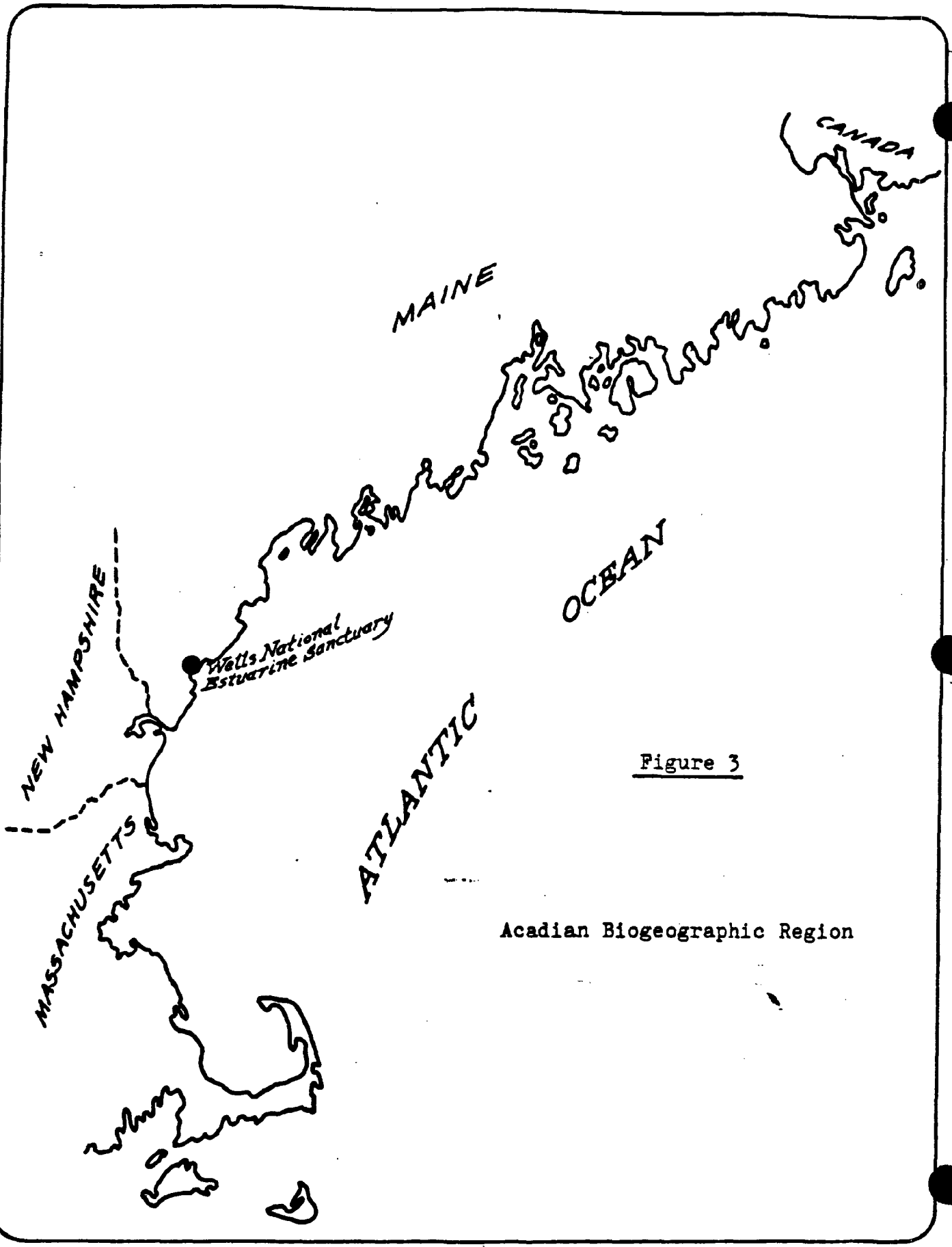


Figure 3

Acadian Biogeographic Region

Hydrology

There are two major hydrologic units in the Sanctuary; the Webhannet River and the Little River. (See Appendix 5) The Webhannet River, the major river system and estuary in the Sanctuary, has a drainage area of 14.1 square miles. The head waters of the Webhannet are relatively undeveloped and its mouth forms an extensive wetland/saltmarsh area.

The Merriland River and Branch Brook meet south of Route 9 to form the Little River, which is the second river/estuarine system of the Sanctuary. Branch Brook drains an area of 10.7 square miles. It begins near the Sanford airport from several springs and flows almost directly to the ocean, forming the border between the towns of Kennebunk and Wells. The Merriland River flows from its source in Sanford across the center of Wells to its confluence with Branch Brook.

The relatively low flows from these two rivers taken with the 20 inch per year average runoff of the area surrounding the estuaries combine to form a fresh water flow which is dwarfed by tidal flushing. The tides are semi-diurnal in the mesotidal range (3-4 meters). The estuaries are well-mixed with surface salinities approaching that of sea water at high tide. At low tide they drop to 18 ppt 200 meters from the ocean.

Geology

Southern York County lies on the northwestern flank of the Rockingham anticlinorium and the southeastern flank of a synclinorium whose axis forms a broad curve through the towns of South Lebanon, North Lebanon, and Acton. This gross structure is obscured locally by smaller super-imposed folds. The Sanctuary is situated between the Raitt Anticline and what might be interpreted as a northeast extension of the Eliot Syncline, both with northeast trending axes. The Sanctuary's bedrock forms a part of the Kittery Formation, a unit estimated to be of early Silurian age and composed of low-grade metamorphics. (See Appendix 5). The formation is most likely of marine origin and evidence suggests it may be an altered turbidite sequence. The unit consists of purplish grey, hard, brittle, fine-grained quartzite interbedded with a slightly siliceous phyllite which grades to a fine-grained biotite-quartz schist. Thin layers of calcite marble can be found scattered through the sequence. In general, the rocks of the formation are nearly uniformly fine-grained and non-porphyroblastic, although ellipsoidal concretions of calcite, dolomite, lime silicates, and quartz are common in some beds.

Fauna

The primary wildlife groups using the Sanctuary include waterfowl (breeding, migrating, wintering), raptorial birds (breeding, migrating, wintering), shorebirds (breeding and migrating), water birds (breeding, migrating and wintering), gulls and terns (breeding, migrating and wintering), passerine birds (some resident, breeding, migrating and wintering), terrestrial and marine mammals (resident), and reptiles and amphibians (resident). (See Appendix 3).

The Sanctuary does not support large populations of fin fish, though Atlantic and Coho Salmon as well as sea run Brown Trout and Brook Trout constitute a small recreational fishery. The estuaries are important breeding areas for

intertidal and subtidal invertebrates that are of the type common to the region such as soft shell clams, green crabs and sandworms. Zooplankton are present in the water column of the Webhannet River while preliminary evidence suggests there is mainly benthic fauna in the Little River.

Threatened and Endangered Species

Two federally endangered species, the bald eagle and peregrine falcon occur within the bounds of the Sanctuary. Peregrine falcons migrate along the southern Maine coast in the fall, while bald eagles are observed during the winter months.

Two other significant species are the piping plover and the least terns. Both have nested within the Sanctuary, and may do so again in the future. The piping plover is currently proposed for Federal and State endangered species designation, and the least tern has already been declared endangered within Maine.

Habitat Types

The variety of plant communities found within the Sanctuary are diverse and represent marine, estuarine, forest, non-forest and agriculture systems. The classes of habitats, named according to the U.S. Fish & Wildlife Classification system adopted in 1980, include both subtidal and intertidal subsystems. The estuarine classes found here are Unconsolidated Shore, Aquatic Beds, Flats, Streambed, Beach/Bar Emergent Wetlands and Scrub/Shrub Wetlands. The marine classes are limited in area and include subtidal Unconsolidated Bottom of the Webhannet River mouth and intertidal Unconsolidated Shore directly off the beaches. (See Appendix 4 for a listing of Flora).

CULTURAL

Land Use History

The Town of Wells was settled in 1640, one of the earliest settlements in Maine. It was the frontier of the northernmost settlement that was continuously settled during the French and Indian War. Life through the mid 1700's in Wells was centered around the many garrisons which provided protection against numerous Indian raids.

The main activity during this time was clearing land and farming. The King's Highway ran along Drakes Island Beach and forded the Little River to cross into Kennebunk on Crescent Surf Beach. Farmers owned rights to sections of the marsh from which they harvested salt hay. There were similar rights to sections of the beach for the collection of seaweed as a fertilizer. Both of these practices continued into the 20th century, and seaweed is still harvested from the beach by gardeners.

Farming decreased in importance during the Industrial Revolution of the post Civil War era and tourism gradually became Wells' major industry, starting modestly in the 1880's and flourishing from the 1920's to the present.

Wells Sanctuary and Drakes Island Game Sanctuary

In 1927, through Chapter 31 of the public laws, the Maine Legislature created a Game Sanctuary in the Town of Wells. (See Figure 4). The Legislature protected Game in this area by proclaiming "no person shall, except as provided, at any time, hunt, pursue, shoot at, molest or kill any wild animal or any game or wild bird." In 1973 this area was enlarged by the Legislature to include a portion of Drakes Island. (See Figure 4).

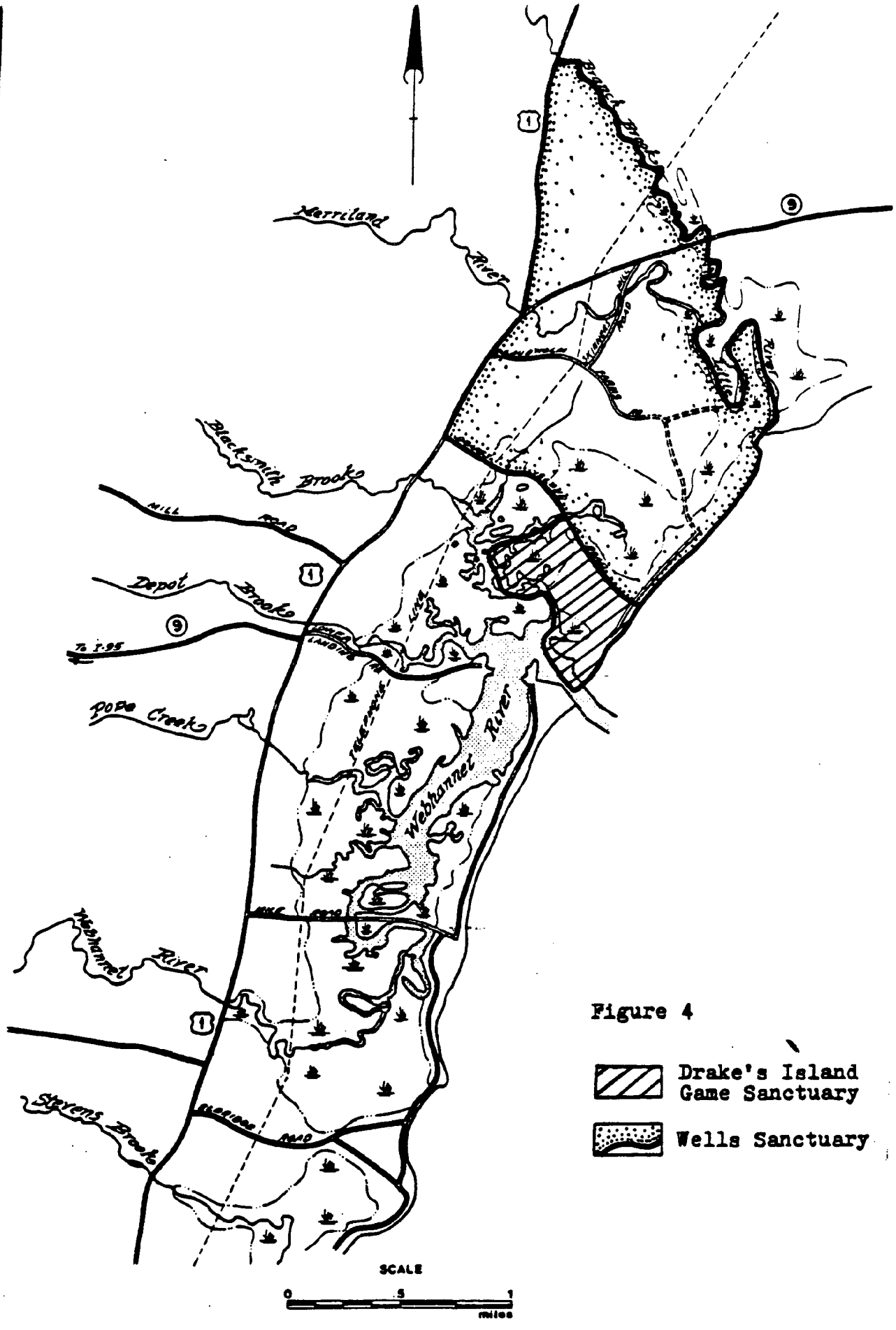


Figure 4

Drake's Island Game Sanctuary

Wells Sanctuary

SECTION II:
MANAGEMENT STRATEGY

MANAGEMENT STRATEGY

The management strategy for the Sanctuary is based on the goals of the Sanctuary (see below) and is comprised of four elements -- resource protection and regulation, acquisition, administration, and management activities.

A. To manage the Wells National Estuarine Sanctuary as a natural field laboratory and educational site. This includes the protection of the estuaries, transitional areas, and adjacent uplands and the use of these areas for short and long-term estuarine research, education, and interpretation.

B. To protect fish, wildlife, and plant communities, and to prevent activities detrimental to migratory waterfowl and other wildlife communities particularly endangered and threatened species.

C. To promote the cooperative management by Federal, State and municipal agencies of the Webhannet and Little River estuaries.

D. To allow for multiple uses of the Sanctuary, including the continuation of existing low intensity recreational uses, and activities related to fish and wildlife uses (e.g. hunting, fishing, wildlife observation), which are compatible with the Sanctuary's character as a natural field laboratory and educational site.

E. To develop and operate a low intensity recreational facility in Laudholm State Park. This facility may offer activities such as parking, interpretive trails, a boardwalk, beach access, swimming, picnicking and sanitary facilities. These facilities shall be established in a manner which protects the natural resources of the Little River estuary and furthers the public education and interpretive aspects of the Sanctuary.

RESOURCE PROTECTION AND REGULATION

A. Existing Laws and Regulations

There are a variety of Federal, State and local laws which provide for the protection and management of estuarine and related water and land resources.

Federal

Many Federal laws and regulations (e.g, water and air pollution control, hazardous waste, etc.) are, for the most part, delegated to states. In addition, all Federal activities or Federally permitted activities in Maine's coastal area must adhere to the Federal Consistency provisions of the Coastal Zone Management Act of 1972, as amended. These provisions require a Federal agency to comply, to the maximum extent practicable, with State laws for any land/water alterations and planning/construction activities that directly affect the State's coastal area. The laws with which Federal agencies must comply are contained in Maine's Coastal Zone Management Program, and are described in Appendix 6.

State

The Maine coast, including the entire Sanctuary, is regulated by many State laws. State laws which protect Sanctuary resources include the:

- Shoreland Zoning Law (T30 4811-4817)
- Protection and Improvement of Waters (T38 361,411-5)
- Coastal Wetlands Act (T38 471-6, 78)
- Site Location of Development Act (T38 481-5, 488-90)
- Subdivision Law (T30 4956)
- Coastal Oil Conveyance Law (T38 344-349, 541-557, 560)
- Marine Resources Management Law (T12, 3504)
- Alteration of Rivers and Streams Act (T12 7776-80)
- State Plumbing Code (regulations)
- Submerged and Intertidal Lands Law (T12-558-A)

These laws provide substantial protection for coastal resources and, in combination with several others, provide the basis for Maine's Coastal Program approved by the federal government under section 306 of the Coastal Zone Management Act of 1972 as revised. A complete description of how these laws control development and protect the coast, is contained in the Final Environmental Impact Statement on Maine's Coastal Program, issued in August of 1978. (A brief overview of these laws is in Appendix 6.)

Local

At the local level the Town of Wells has adopted municipal zoning, shoreland zoning, and subdivision regulations and enforces the State Plumbing Code.

The Town has zoned the entire Sanctuary either Rural or Resource Protection. The more restrictive Resource Protection zone generally includes all beaches, wetlands and land areas within 200 feet of tidal water or marshland. The purposes of the Resource Protection zone are to protect from adverse affect "water quality, productive habitat, biotic systems and scenic and natural values". Approximately 85% of the Sanctuary is zoned this classification which allows only non-structural, non-extractive uses and is subject to specific performance standards for timber harvesting, agriculture, erosion control, and construction of minor structures appurtenant to permitted activities.

Portions of the Sanctuary are in a Rural Zone which allows non-commercial/ industrial buildings and a variety of non-structural uses such as agriculture, timber harvesting and recreation. Performance standards to control the effects of development are also applied in the Rural zone through the zoning ordinance and minicipal subdivision regulations.

The State Plumbing Code, which is enforced locally, prohibits the installation of septic sewage disposal systems in about 85% of the Sanctuary owing to unsuitable soil conditions or proximity to surface waters.

B. General Permits and Licenses

Several existing uses of the Sanctuary now require that the user obtain a permit or license to engage in the activity. These include:

Shellfishing - The Wells' shellfish ordinance requires a license to collect or dig clams, mussels or quahogs. Being primarily a recreational and seasonal activity, this use will continue in its present regulated fashion unless there are significant increases (permitting commercial harvesting) or decreases (causing permit limits) in the resource.

Fishing - State laws require licenses for fishing in fresh water. Anadramous fishing is currently a limited activity in the Sanctuary, though future upstream stocking may make this a more popular activity and require additional regulation.

Hunting - Hunting is currently prohibited in the eastern half of the Sanctuary by State law. In the remainder of the Sanctuary, hunting is regulated by the U.S. Fish and Wildlife Service which issues permits for hunting. The Rachel Carson National Wildlife Refuge opens certain portions of the Refuge to hunting of waterfowl, upland game birds, and deer. Hunters must pass competency tests in order to receive a license.

There are several other Sanctuary activities which require approval by the Sanctuary Manager. These include: the group use of non-interpretive trails, construction activities, and resource management activities.

Group use (eg. nature students, school classes, etc.) of non-interpretive trails are monitored to insure that adequate supervision is available and that such use does not infringe upon research activities.

Construction activities, including Sanctuary facility development are within the scope of local, State and Federal laws described in the Resource Protection and Regulation Section.

Resource management activities are subject to approval and monitoring by the Sanctuary, Refuge and Park Managers on a case by case basis. These activities require the development of special plans for such activities and are reviewed by the managing entities for conformance with the objectives and policies of the Sanctuary Management Plan.

C. Regulations Applicable to the Sanctuary

Currently the only regulations that apply solely to land areas within the Sanctuary are those promulgated for the Refuge and the State Park.

The United States Fish & Wildlife Service operates the Refuge pursuant to Title 50 of the Code of Federal Regulations. Parts 1-199 are the existing regulations issued by the Service. These regulations address a variety of management issues pertinent to the Sanctuary. For example opening/closing times, safety regulations, permitted uses, recreation, taking of game, etc. are discussed.

The Rachel Carson Wildlife Refuge may issue special regulations that apply specifically to the Refuge. An example of these are the Refuge's Public Use Regulations (See Appendix 7) that describe how the public can use the Refuge.

The Bureau of Parks and Recreation within the Department of Conservation has a standard set of park regulations that are applicable to all State parks. These regulations (See Appendix 7) are established pursuant to Title 12, Section 602 of the Maine Revised Statutes Annotated. The regulations pertain primarily to the use of State Parks, and apply, for example, to protection of natural values, fires, pets, refuse, and group use.

D. Wells Sanctuary Code of Regulations

A uniform code of regulations and enforceable policies for the Wells Sanctuary will facilitate cooperative management amongst the three landowners and will make the most efficient use of on-site personnel. As described above each landowner has promulgated regulations which are different from each other.

By 1986 the three landowners will draft a uniform code of regulations. There will be two principal components of the Code -- Sanctuary Regulations and Sanctuary Enforcement Procedures.

Code of Regulations - The Code will describe in detail the regulations and enforceable policies which the on-site personnel can enforce.

Enforcement Procedures - The emphasis of the procedures will be on swift and efficient enforcement of the Code. It will provide the legal mechanism to allow for mutual enforcement irrespective of landownership. (eg. the on-site managers will be able to enforce Federal, State and local laws).

E. External Effects on the Sanctuary

Water quality within the Sanctuary could be affected by development along the Webhannet, Little, and Merriland Rivers, and Branch Brook. State and local regulations which apply to land and water uses within the Sanctuary apply to those outside it affording the same level of control and protection.

Additionally, all of the land east of Route 1, within 200 feet of Branch Brook and the Merriland Rivers, is in a Resource protection zone, effectively prohibiting any new building construction or the placement of septic/sewage disposal systems. Further, about 95% of the 40-odd square miles of land within the drainage area of the Sanctuary is either in a Rural zoning district (large lot sizes and development generally restricted to residential) or in the case of Branch Brook is in a municipal water supply watershed and subject to additional control by the Kennebunk, Kennebunkport and Wells Water District.

ACQUISITION

Within the boundary of the Wells National Estuarine Sanctuary is land owned by the United States Fish & Wildlife Service, the State of Maine, and the Town of Wells. (See Figure 5) In addition there is land that may be donated to and/or purchased by the Town and the U.S. Fish & Wildlife Service. (See Figure 6)

A. U.S. Fish & Wildlife Service

In 1966 the Rachel Carson Wildlife Refuge was established and the Service began to acquire land within the proposed boundary of the Refuge. Currently there are three categories of Refuge land that are affected by the Wells Sanctuary. These include:

Category	Acres
land owned by the Service and included within the Sanctuary	1015.83
land owned by the Service but excluded from the Memorandum of Understanding (See Appendix 2)	223.6*
land within the Refuge boundary but not owned by the Service (inholding.)	275 **

* This land is north of the Little River, located primarily within the Town of Kennebunk. The Town of Wells will initiate discussions with the Service and Kennebunk in 1986 to amend the Memorandum of Understanding to include this land within the Sanctuary.

** The U.S. Fish & Wildlife Service will continue to acquire land within the Refuge boundary as willing sellers and funding permits. (see Figure 6)

B. State of Maine

The State of Maine owns 300 acres of land that are within the boundary of the Sanctuary. (See Figure 5). The Maine Department of Conservation, through the Bureau of Parks and Recreation, is responsible for developing 198.5 acres as a low intensity recreational area. The State will acquire an additional 15 to 30 acres within the boundary of the Sanctuary as willing sellers and funding permits. Currently $250,000 in State funds are reserved for land acquisition within the Sanctuary.

The Bureau of Public Lands also owns and manages 100 acres of submerged lands in the Sanctuary. This land is managed in accordance with this Management Plan and the BPL submerged lands management plan.

C. Town of Wells

Between 1982 and 1984 the Town of Wells negotiated with a major landowner within the boundary of the Sanctuary. In 1984, the Town signed a Purchase Sales Agreement that identified 245 acres of land and several buildings the Town would purchase.

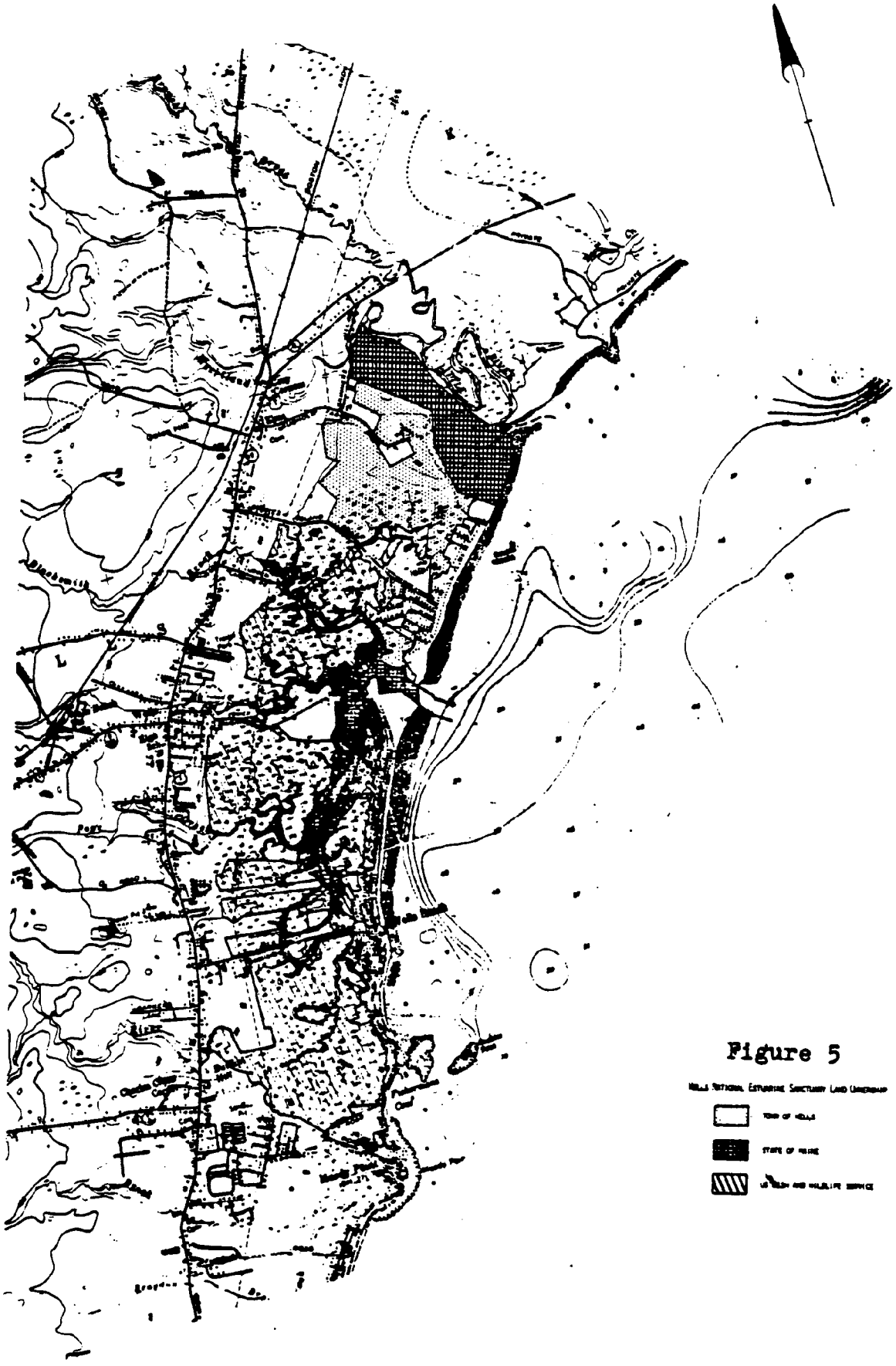


Figure 5

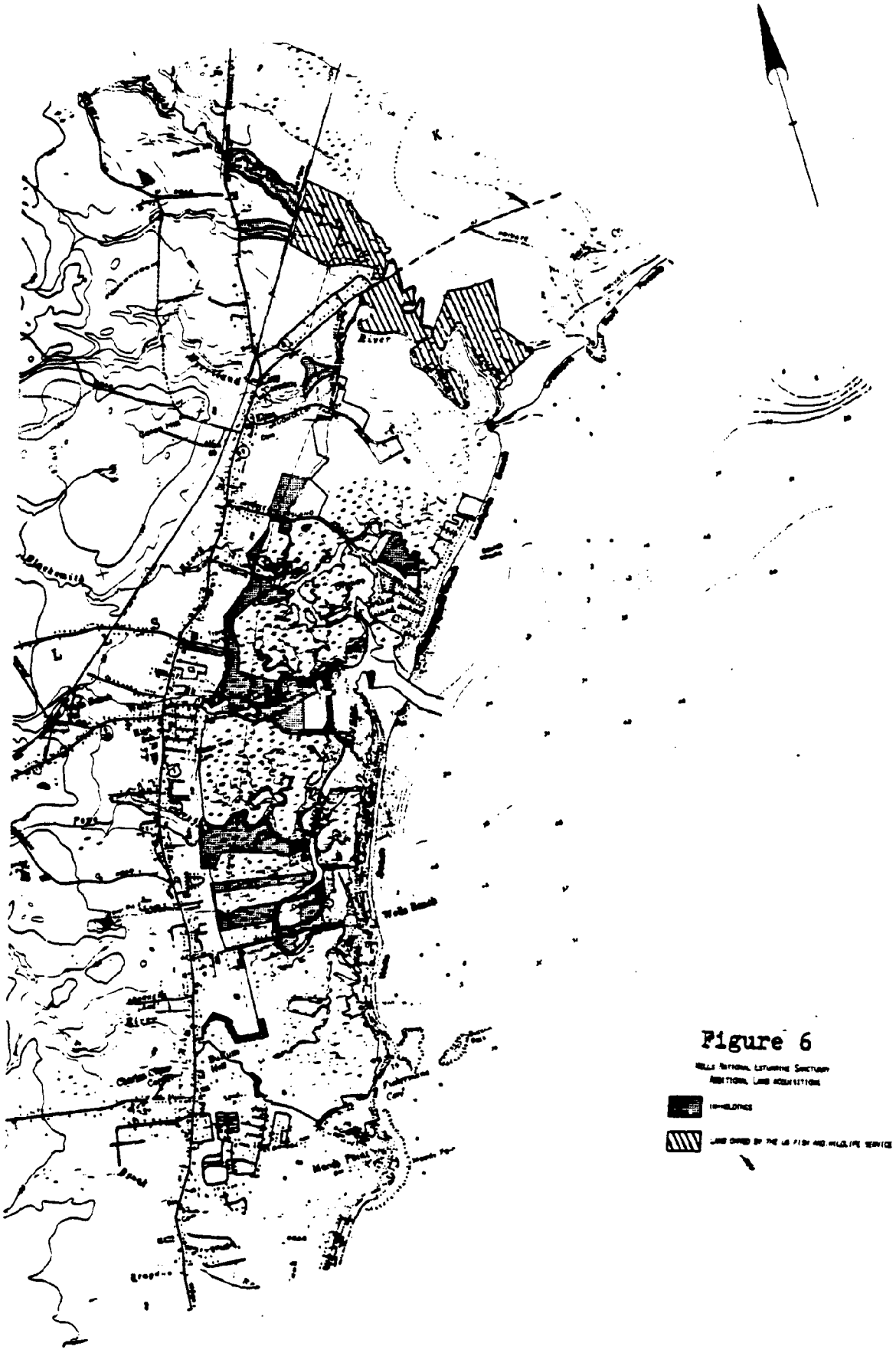


Figure 6

The Agreement provided for the land to be acquired by the Town in two Phases -- October, 1984 and April, 1985. Phase I contained 90 acres of wetland, 55 acres of upland and .5 acres of beach property. Phase II contains 100 acres of upland and several farm buildings to be used for Sanctuary related activities.

In addition, the Town has included a 13 acre town marsh and upland area at the mouth of the Webhannet River in the Sanctuary.

The Town, similar to the Fish & Wildlife Service, will work on acquiring inholdings either through purchase or donation.

D. Acreage Summary

Land & Water Areas within the Sanctuary:

Town of Wells	145.5	(Laudholm Farm)
	13	(Town marsh on Drakes Island)
	2.3	(Donation by John Coughflin)
State of Maine	198.5	(Laudholm State Park)
	100	(Submerged lands)
Fish & Wildlife Service	1015.0	
	1,472	

Land Proposed for Inclusion in Sanctuary:

Town of Wells	100	(Laudholm Farm)
	93	(Harbor, Merriland, Branch Brook)
Fish & Wildlife Service	223.6	(Owned but not in Sanctuary)
	275.	(Refuge inholdings)
	691	

ADMINISTRATION

A. Role of Landowning Agencies

Daily management of the Sanctuary is a shared responsibility. The Town of Wells holds title to the lands acquired with Federal and local Sanctuary funds. This land is managed in cooperation with the Maine Department of Conservation (DOC) and U.S. Fish and Wildlife Service (U.S.FWS). The DOC manages the submerged lands and Laudholm State Park, and the U.S. FWS manages the Rachel Carson National Wildlife Refuge.

In the event the Town should fail to perform its management responsibilities the Bureau of Parks and Recreation (BPR) within the Department of Conservation would be responsible for overseeing management of the Sanctuary, as specified in the Memorandum of Understanding between the DOC and the Town (see Appendix 1). The Town, through the Laudholm Trust, has agreed to provide to the Department of Conservation a minimum of $50,000/year for two years--in escrow for operational purposes.

The Office of Ocean & Coastal Resource Management and the State will monitor the management of the Sanctuary to ensure it is managed as a National Estuarine Sanctuary, consistent with this management plan and with applicable federal regulations (see Appendix 14).

Each of the land-owning entities within the Sanctuary have retained their individual land management responsibilities and have at the same time agreed to manage their holdings according to the goals and objectives delineated in this Sanctuary Management Plan. To the extent practicable, the three management entities will share facilities and staff for Sanctuary operation purposes.

The Rachel Carson Wildlife Refuge was established in 1966 to preserve valuable wildlife habitat, particularly several high quality coastal marshes. The objective of the Refuge is to utilize its diverse habitats to:

- Perpetuate the migratory bird resource and preserve the natural diversity and abundance of mammals and non-migratory birds on the Refuge;

- Provide opportunities for the visiting public to gain knowledge, understanding, and appreciation of wildlife and wildlands through the use of interpretive media;

- Provide understanding and appreciation of fish and wildlife ecology and man's role in his environment through a formal environmental education program; and

- Use refuge lands and resources for activities that provide ample enjoyment and relaxation such as hunting, fishing, photography, and observation.

Currently the U.S. Fish and Wildlife Service operates a Refuge headquarters and a small trail system for the Rachel Carson National Wildlife Refuge. Although these facilities are not included in the MOU (see Appendix 2), they are available to all Sanctuary visitors.

The Town is responsible for establishing a visitor center for the Sanctuary. In 1986, when the center is established, the three managing entities will work cooperatively to create displays and programs. During the period of trail development, technical assistance on trail design and layout will be provided by all entities. All facilities developed in conjunction with the Sanctuary will be shared by the managing entities. Specific management responsibilities are discussed in the Memorandum of Understandings in Appendices 1 and 2.

B. Sanctuary Advisory Committee

To achieve effective coordination and cooperation among the public and private groups participating in the Sanctuary, a Sanctuary Advisory Committee (SAC) assists and advises the three management agencies. (See Appendix 8 for a listing of the Committee Members.)

The SAC is an advisory board to the three land owners. Its primary role is to review and recommend appropriate courses of action; it is not a decision-making body. The SAC performs, but is not limited to, the following functions:

- review Sanctuary research and education proposals and make recommendations to the three landowners;

- advise the landowners on proposed actions, plans, and projects in, adjacent to, or affecting the Sanctuary in a significant manner.

- enhance communication and cooperation among all interests involved in the Sanctuary;

- review the annual performance of the Sanctuary Manager and make recommendations to the town; and

- suggest methods of resolution for management conflicts between Sanctuary management entities.

C. On-Site Management Personnel

On-site management, including daily operation, will be performed by the Town, the State and the FWS. The town is the lead agency responsible for overall Sanctuary management.

1. Sanctuary Manager

A full time Sanctuary Manager will be employed by the Town. The Manager will have expertise in the field of natural area management, be familiar with research techniques and educational programming, and have strong administrative skills. The latter qualification is essential for the Sanctuary Manager to perform the job satisfactorily. (see Sanctuary Manager Job description in Appendix 15) The Sanctuary Manager performs the following functions:

- Develops and writes work program and annual budget for the Sanctuary.

- Develops and writes annual reports that document and discuss major activities, issues, and management opportunities.

- Selects, trains, and evaluates Sanctuary volunteers, docents, and staff.

- Enforces Sanctuary regulations.

- Prepares and/or supervises preparation of educational and interpretive concept plans, publications, exhibits, and demonstration areas.

- Coordinates scientific investigations that advance the objectives of the Sanctuary.

- Assists in preparation of financial applications to funding agencies and organizations.

The Sanctuary Manager is selected using the following procedures:

1. A Selection Committee is formed composed of a representative from the:

   - o Town of Wells (selected by the Selectmen)
   - o Sanctuary Advisory Committee (selected by the Committee)
   - o State Planning Office (selected by the SPO Director)
   - o Department of Conservation (selected by DOC Commissioner)
   - o United States Fish & Wildlife Service (selected by the Refuge Supervisor)

2. The town, with technical assistance from the Selection Committee, solicits applications and resumes from qualified individuals.

3. The Selection Committee reviews applications, interviews qualified candidates and recommends two candidates, in priority order, to the Wells Town Manager.

4. The Town Manager completes the selection process by hiring one of individuals. (In the event neither of the individuals accept the position, the Town Manager will request two more names from the Committee).

The performance of the Sanctuary Manager will be reviewed annually by the Town Manager and the Sanctuary Advisory Committee. The evaluation will consider the quantity and quality of the manager's work, ability to use job knowledge, judgement and decision making ability, supervisory skills, and ability to coordinate overall Sanctuary management with the Refuge and State Park. The SAC will submit a recommendation to the Town Manager which will render a final decision.

2. Park Manager

When the Park is developed, a full-time seasonal employee (28 weeks per year) will be placed in the Sanctuary by the Department of Conservation to manage the Laudholm State Park. The Park Manager will report directly to the Regional Parks Supervisor. The Manger will have the classification of a Park Manager II and will perform the following functions:

- administer all operational activities and programs of the Park;
- coordinate State Park management with other Sanctuary management activities; and
- train and oversee the work of other staff persons assigned to the Park.

Currently, the DOC has a park ranger, a seasonal employee, working during the summer. This position assists the Town and Refuge in jointly managing the Sanctuary.

3. Refuge Manager

The U.S. Fish and Wildlife Service operates six manned National Wildlife refuges in northern New England, including the Parker River and Rachel Carson National Wildlife Refuges. These are administered by a Refuge Manager stationed in Newburyport, Massachusetts. The Carson Refuge has an on-site manager, (officially an Assistant Refuge Manager), in residence at the Carson Refuge headquarters adjacent to the Sanctuary.

The Assistant Refuge Manager has a wide range of responsibilities which are delineated in the U.S.FWS Refuge Manual. Among the more significant of these are:

- issuance of use permits (hunting, interpretation, research, etc);
- enforcement of refuge laws;
- performance of wildlife inventories; and
- public relations.

In addition to the traditional responsibilities the Refuge Manager will coordinate refuge management with other Sanctuary management activities.

D. Laudholm Trust Responsibilities

The Laudholm Trust was established in 1982 to assist the Town of Wells in acquiring land for the Sanctuary and to provide operating funds. To-date the Trust has focused on negotiating with landowners within the Sanctuary and raising funds for the Town to match federal acquisition and development funds.

The Trust is responsible for raising all funds the Town needs to operate the Sanctuary. These funding needs are developed in the annual Sanctuary budget. During the first five years of operation, the State can apply for a maximum of $50,000 a year from the Office of Ocean and Coastal Resources Management. These funds will be released when the Town certifies there are $50,000 in local funds available for match. Beyond the five year period the Trust will raise funds as required in the annual budget.

In 1985 the Trust and Town will enter into a Memorandum of Understanding that sets forth the basic framework of the funding relationship between the Trust and the Town.

In summary, the Trust has no direct management authority in the Sanctuary, but rather is responsible for providing adequate funds to the Town for operating and development purposes.

E. Annual Work Programs and Budgets

The preparation of annual work programs and budgets by the three managing entities serve to facilitate cooperative management of the Sanctuary. Each managing entity will routinely prepare and circulate a draft work program for

review by the other major landowners prior to finalizing it. This process encourages joint funding of specific facilities and/or projects as well as encouraging the on-site managers to work closely on management of the Sanctuary.

This management plan recognizes that local, state and federal annual budgets are prepared at different times of the year making it difficult to maximize coordinated funding of specific projects.

The preparation of an annual work program by the Town follows the process described below:

Step 1 - The three on-site managers confer on upcoming Sanctuary needs and requirements. The Sanctuary Manager then prepares a preliminary work plan.

Step 2 - The Sanctuary Manager confers with the State Planning Office and the Town, through Laudholm Trust, to determine anticipated funding levels for the upcoming year.

Step 3 - The Sanctuary Manager prepares a draft work program and circulates it to the other on-site managers, the Sanctuary Advisory Committee, and the Town Manager.

Step 4 - The Sanctuary Manager revises the work program, based on reviewer's comments, and assigns preliminary budget figures to the work tasks. (Priorities are assigned to the tasks so that when the budget is finalized the most important activities are supported.)

Step 5 - The Sanctuary Manager prepares an annual budget to implement the annual work program. The budget is divided into daily operating expenses (eg., salaries, travel, equipment, supplies, other) and special projects (eg., building renovations, trail development, visitor center displays, signs, parking, etc.).

Step 6 - The Sanctuary Manager submits the work program and budget to the Town Manager for approval. Upon approval it is submitted to the State Planning Office for inclusion in the grant application to the Office of Ocean & Coastal Resource Management. (The Sanctuary is eligible to receive up to $50,000/year in federal funds for five years. This must be matched with an equal sum of non-federal funds.)

At the time of submission to the State Planning Office, the Sanctuary Manager will receive written confirmation from the Laudholm Trust that the non-federal share is available. This confirmation will be a part of the annual budget request.

Step 7 - The State Planning Office and the OCRM process the grant application.

Step 8 - The State Planning Office contracts with the Town providing the funds awarded* The Laudholm Trust enters into a similar contract with the Town. These contracts describe the work to be performed, the budget, the work schedule, and any contract conditions.

Step 9 - The annual work program and budget, as revised based on the funds available, are implemented by the Sanctuary Manager and others.

* The Town of Wells will develop appropriate accounting controls to accept and record all federal and non-federal funds. In addition, accounts should be sufficiently detailed to distinguish fees, income , and donations collected at the Sanctuary.

F. Long-Term Support of the Sanctuary

State and Federal financial support of the State Park and the Rachel Carson Wildlife Refuge are relatively assured. Annual appropriations, license fees, and use fees are expected to cover all operating and maintenance expenses.

Local support for the town-owned portion of the Sanctuary will come from user fees, private donations and eventually an endowment established through private donations. The objective of the Town, through the Laudholm Trust, is to establish a $250,000 endowment within five years of acquisition and by ten years establish an endowment of $500,000.

G. Current Mangement Initiatives

The Service has two plans approved for the wildlife refuge. There is a boundary plan, that depicts land owned by the Service and inholdings, and a hunting plan, that perscribes where and how hunting shall occur in the Refuge.

The Service has not established a formal Refuge Master Plan (similar in scope and purpose to a Sanctuary Management Plan). The preparation of the Master Plan normally takes 18 months and involves preparing an Environmental Assessment. From the Master Plan come Management Plans, similar to the boundary and hunting plans, for specific refuge resources (eg. forest, grass lands, enforcement, etc.).

The Refuge Master Plan is scheduled to be initiated in 1987. Until this Refuge Master Plan is completed by the Service, the Refuge portion of the Sanctuary will continue to be managed as it is now, primarily in a preservation and protection mode, with limited interpretation, hunting, banding and inventory work. These and other management activities are described in the Refuge Mannual. As the Refuge Master Plan is developed the Service will work closely with the Sanctuary Manager, the State, and NOAA.

The only other plan for the Sanctuary was prepared by the Department of Conservation. The DOC has prepared a concept development plan for the State Park (see appendix 1) but has not implemented it. The plan addresses public use and access to the State property. It will be used to guide development of the State Park.

H. Relationship of Maragement Personnel

The Sanctuary Manager has the lead responsibility in determining the compatability of DOC and U.S.FWS activities with the Sanctuary Management Plan. The Manager is responsible for managing Town-owned Sanctuary lands and activities arranged with other agencies. The Manager is also responsible for monitoring the management actions of other agencies and reporting any deviation from Management Plan policies to the town, the State Planning Office and NOAA. Figure 7 shows both the existing and proposed management staff for the Sanctuary.

The DOC and FWS Managers, besides being responsible for managing their own areas, keep the Sanctuary Manager aware of upcoming management actions. Management actions that are potentially inconsistent with Sanctuary goals and objectives will be fully discussed by all management entities when they are proposed.

An effective working relationship between the Managers is facilitated in two ways. The first is the preparation of monthly status reports by the managers that describe operating/management issues and opportunities. These reports will be circulated amongst the managers as well as the State Planning Office and the OCRM. In addition, the three managers will meet, on a monthly basis, to review management activities and upcoming events. Finally, the managers will prepare annual work programs and circulate copies to the other managers prior to finalizing them.

I. Sanctuary Permits and Notification

The only activities the Sanctuary Manager issues a permit for are research projects and specific educational activities in the Sanctuary. All researchers must address specific research proposal questions (see Appendix 12), submit the information to the Sanctuary Manager, and receive approval prior to commencing the research. A complete description of the research permit procedure is contained in Section V: Research. Figure 8 is an example of how a permit is processed.

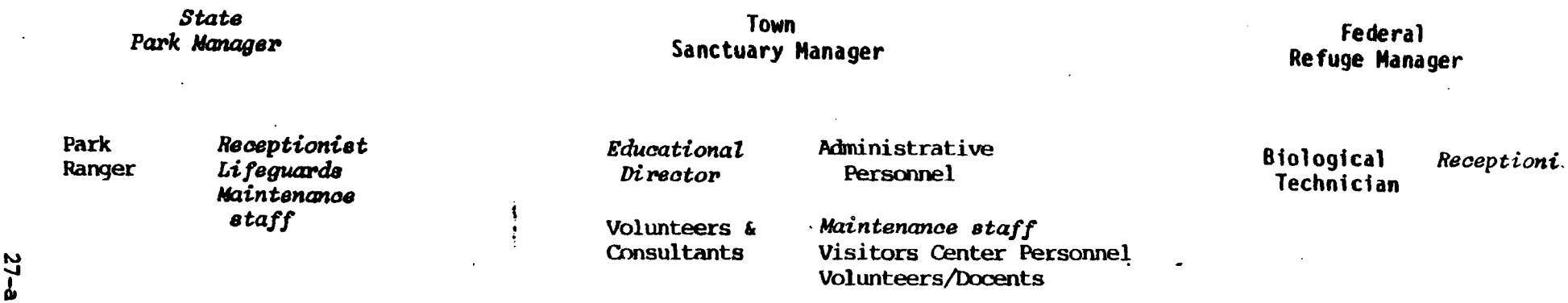
An educational permit is required when an educational activity involves collecting or sampling of Sanctuary resources. To receive a permit, the Sanctuary manager must receive a letter from the applicant explaining the proposed activity, the timing and the degree of collection or sampling. The permit procedure for educational activities is similar to the research procedure. In general, the Sanctuary Manager will issue a permit if the proposed activity is consistent with the goals and objectives of the Sanctuary.

All educational uses of the Sanctuary involving groups larger than 15 persons must contact the Sanctuary Manager in advance and make reservations. Reservations are particularly important for scheduling purposes when groups require guided tours or presentation in the visitor center. Educational/interpretive uses of the Sanctuary by small groups or individuals are encouraged and require no advance notification.

Figure 7

Wells National Estuarine Sanctuary

Management Staff



NOTE: Those positions in italics are anticipated and are not funded at this time.

Figure 8

The Wells Sanctuary Permitting Process

Example #1: An individual wants to perform estuarine related research on land included within the Wells Sanctuary.

Step #1 - The applicant discusses the proposal with the Wells Sanctuary Manager (WSM) and requests a permit to perform the research →

Step #2 - The WSM furnishes the applicant with an outline of the research proposal information requirements. (See Appendix 12) →

Step #3 - The applicant completes the information requirements and submits them to the WSM.* ↓

Step #4 - The WSM reviews the materials for completeness and circulates copies to the research proposal reviewers.** ↓

Step #5 - The reviewers evaluate the proposal and provide written comments to the WSM within 15 working days. ←

Step #6 - The WSM reviews the comments and makes one of two decisions. ↓

Step #7a Issue Permit
Provided there is concurrence by the affected landowner(s) and supporting comments are received the WSM will issue the permit. ↓

Step #8a - The applicant receives permit, concurs with conditions and initiates project.

Step 7b Not Issue Permit
The WSM notifies applicant of permit denial and stipulates reason(s) for rejection. (The WSM cannot issue a permit over the objection of the affected landowner(s).) ↓

Step #8b - The applicant can modify proposal to address deficiencies or withdraw proposal.

* The applicant should plan to submit supplementary materials at this time that fully describes the proposed project.

** Individuals that will review all proposals include the Refuge Manager, the State Park Manager, the Chairman of the Education and Research Subcommittee of the Sanctuary Advisory Committee, the Maine Coastal Program Manager within the State Planning Office and the Office of Ocean and Coastal Resource Management.

The three managing entities retain sole authority and responsibility for their land. In the event a conflict arises the affected agency official(s) will review the situation and render a final agency decision. The managers will then implement the decision. Affected parties may request a decision to be evaulated as shown in Figure 9.

J. Conflict Resolution

Potential or real conflicts are determined by the Sanctuary Manager on the basis of notification by one of the other managers or by observation. If the managers are unable to resolve a potential conflict through modification of a proposed activity, the Sanctuary Manager will request the managers to inform their respective agency officials. The Sanctuary Manager shall also notify the State Planning Office, NOAA and the Sanctuary Advisory Committee.

Figure 9

Wells National Estuarine Sanctuary

Elevation Procedure

State Organization	Town Organization	Federal Organization
Governor of Maine	Selectmen*	Director: US Fish & Wildlife
Commissioner: Department of Conservation	Town Manager	Regional Director
Parks Supervisor		Refuge Supervisor
Parks Manager	Sanctuary Manager	Refuge Manager

* The selectmen may elect to defer judgement on particular issues to town vote.

The three managing entities may elect to resolve a dispute by submitting it to an independent panel. The panel will consist of three individuals, one selected by each of the three agencies, and two individuals from the Sanctuary Advisory Committee, that are selected by the full committee. The individuals selected by the agencies will not be employees of the agency nor will they be affiliated with the project.

The panel will use standard mediation dispute practices. Once referred to the panel, the panels decision will be binding. The decision must be consistent with this Management Plan and applicable federal sanctuary regulations.

K. Plan Review and Modification

A biennial review of the Sanctuary Management Plan shall be conducted by the Sanctuary Advisory Committee, the major landowning agencies, and NOAA. This biennial report shall include a review of management tasks achieved, problems encountered, recommendations, proposed alterations to the SMP, and a commentary

on scheduled management goals and tasks for the upcoming year. Before proposed changes can take effect, they must be reviewed and approved by the major landowning agencies and NOAA/OCRM. The biennial report shall be initiated no later than September 15 of each odd numbered year starting in 1987 and be completed by December 15 of that same year.

MANAGEMENT ACTIVITIES

There are eight broad categories of Management Activities that occur in the Sanctuary. As described earlier, these activities are managed cooperatively by the Town of Wells, the Maine Department of Conservation, and the U.S. Fish and Wildlife Service in the following manner:

1. Wetlands/Natural Areas

Objectives

To manage wetland, transitional land, and sand dune areas in their natural state for use as natural field laboratories in which research, education, interpretive activities can be conducted.

To coordinate the management of local, State and Federally owned wetlands within the Sanctuary.

Description

The wetlands/natural areas within the Sanctuary comprise the largest land area; about 1,300 of the 1,500 acres. Most of this area is owned by the U.S. Fish & Wildlife Service and is managed according to the Services' laws and regulations and the Memorandum of Understanding between the FWS and the Town (see Appendix 2).

Within the State Park and the Town owned portions of the Sanctuary there are approximately 150 acres of salt-marsh, about 75% of which is classified as high marsh, being subject to only occasional tidal inundation. Most of this high marsh lies between the uplands of the Sanctuary area and the back dune of Laudholm Beach. This area is particularly rich in wildlife resources, providing food and shelter for deer, muskrat and other small mammals as well as numerous species of waterfowl and upland birds.

Both the high marsh and low marsh areas, and tidal flats along the Webhannet and Little Rivers, are managed in a natural, protected status. With the exception of a proposed boardwalk for observation and beach access and the installation of a small pier for research activities, no structures will be allowed in this area. Fencing is not expected to be necessary to protect this area as it is mostly inaccessible and buffered by thick vegetation.

Management Activities:

1. The Sanctuary, Park and Refuge Managers will oversee all activities that are scheduled to occur in these areas.

2. The Town and FWS will continue to acquire inholdings to protect the integrity of the Sanctuary.

3. By 1987, the managing entities will, where appropriate, post signs and put barriers at the end of trails to discourage foot traffic in wetlands.

4. In 1987, the FWS will initiate the preparation of Refuge Master Plan and will work closely with the Sanctuary and Park Managers.

2. Research Facilities

Objective

To encourage research within the Sanctuary by providing adequate research facilities.

Description

Research facilities needed for the Sanctuary include a wet laboratory, a dry laboratory and office, stockroom, storage shed, and two small piers. Field equipment such as meteorological and water quality monitoring stations are also required.

The laboratory facilities and storage areas may be located on the ground floor of the main farm house, near the Visitors Center. The final floor plan and storage layout will be determined in more detail, as will the cost of establishing the laboratories when the main house is acquired during Phase II of the Sanctuary acquisition in 1986. (Facilities and equipment are specified in Appendix 9.)

Management Activities

1. In 1985-86, the Education/Research Subcommittee of the Sanctuary Advisory Committee, through the Sanctuary, Park, and Refuge Managers, will develop and implement a strategy to acquire basic research equipment with the operating and management funds.

3. Upland Natural Areas

Objectives

To manage these areas in a manner that protects the wetlands from adverse effects.

To maintain successional hardwood stands to serve as wildlife habitat and visual and pollution control buffers.

To utilize these areas for research, educational, and interpretive purposes provided their use does not diminish the quality of the wetland areas.

Description

Approximately 200 acres of the Sanctuary contains relatively young successional hardwood forest. This area is located at and above the upland border of the transition zones between the wetlands and uplands and bordering the level fields of Laudholm Farm and the State Park.

This successional forest contains a variety of species, with several mature stands of hardwood along the Little River and Drakes Island Road. Some selective cutting has been done in recent years, and most of the stand is forty to eighty years old. Ownership among the three management agencies is generally equally divided.

The current uses of the upland forest area and fields include buffer qualities between developed areas along State and local roads and the Rachel Carson National Wildlife Refuge and wildlife habitat. In the past some wood was cut for fuel at Laudholm Farms and to provide browse for deer at the State Park.

Use of these areas is directed at maintaining the woodlands and fields. The wetlands continue to need a buffer, both for wildlife cover and as a "filter" for human activities such as run-off and noise. Selective thinning may be conducted by all three management entities for a variety of purposes. These include trail construction, prevention of encroachment on other Sanctuary activities and fire prevention. Thinning activities are coordinated through the Managers and are conducted to avoid impacts on the wetlands of the Sanctuary. Commercial scale timber harvesting is not permitted within the Sanctuary.

Management Activities

1. Beginning in 1985, these areas will be used in an interpretive manner to educate the public as to the function and value of these areas.

2. In 1985 the Fish & Wildlife Service will prepare a forest management plan for Service property.

3. In 1987 the Town will act in a lead role in developing a forest management plan, incorporating the Service's Plan. The plan will be approved by the three managing entities and the OCRM.

4. Trail System

Objectives

To expose and inform Sanctuary visitors about the biological, geological and hydrological components of a salt-water estuary and its associated landforms.

To provide a variety of educational experiences and challenges to satisfy the interests of all age and ability groups.

To establish a permanent field observatory to complement science programs of area schools.

To provide an alternative educational experience to the many thousands of tourists who annually visit the Wells Bay area.

To provide access to a variety of ecosystems, educational and recreational sites within the Sanctuary, while at the same time discouraging access to areas unsuitable for extensive use.

Description

A system of foot trails, eventually totalling three miles in length, will be made available to sanctuary visitors. (see Figure 12). These trails comprise the primary interpretive function of the Sanctuary, and as such, will be sited and constructed to carry visitors through the variety of land forms and habitats which are typical of the Acadian Biogeographic region.

Most trails will be self-guiding with observation stations referenced to an explanatory trail guide. Trails will be of various lengths and ecological complexity to meet the needs of different user groups. They are designed to be broadly representative of Sanctuary values to ensure that each gives the user an understanding of the transition from upland to wetland.

Trails will radiate from the Sanctuary's visitor center, and from the F&WS headquarters. The existing Fish & Wildlife Service trails near the F&WS headquarters are not within the Sanctuary but are available to Sanctuary visitors. Trails will also radiate from a centrally located shelter between the two parking lots at the State Park when the State Park is developed.

Trail construction will vary according to the land form, though to minimize environmental damage, critical area treatments such as boardwalks, bridges, mulching and underdrains will be utilized where necessary. Also, overlooks and platforms will be provided as alternatives to trail crossings in wet areas or important or vulnerable habitats. Materials native to the Sanctuary site are used in constructing trail facilities and furniture. Final layout and construction costs of the trails are subject to more detailed study and an on-site environmental assessment. Final design will incorporate the consideration of handicapped access.

Sanctuary trails will be maintained by the Fish & Wildlife Service, Bureau of Parks and Recreation and the Town, each being responsible for that portion of the system on their respective land. The Town, through their cooperative agreement with the Department of Conservation, has the option to maintain the trails within the Park between October and April.

Management Activities

1. In 1985 detailed trail planning will begin. Trail planning will be performed by a consultant in cooperation with all landowners.

2. Trail construction will begin in late 1985 and will be completed by 1988. (The actual trail construction schedule depends on land acquisition schedule and funding availability.)

3. Guided tours of the trail system will be conducted on a pre-arranged basis with the Sanctuary Manager, Park Ranger, Refuge Manager or other employee or volunteer of the Sanctuary. Such guided tours are scheduled and guide arrangements made through the Sanctuary Manager.

5. Visitors Center

Objectives

To provide Sanctuary visitors with an educational introduction and interpretation of the area and encourage them to participate in other Sanctuary activities.

To provide space and facilities for group use of the Sanctuary.

To establish an on-site public relations program.

Description

The primary visitor center of the Sanctuary will be operated by the Town and will be focal point for Sanctuary visitors. The FWS also operates a small office which provides educational and interpretive materials. The FWS office is not located within the Sanctuary and is not discussed extensively in this management plan.

The Town's visitors center will be the focal point of the Sanctuary. It will be located in the main farm house which is prominently sited atop the highest land form in the Sanctuary. The center will be located in an ell at the northerly end of the building. Physically, the visitors center will comprise an area of about 1,400 square feet. (See Figure 10). The main portion, comprising the entire ground floor of the ell, will contain an information desk (staffed by volunteers) from which verbal directions and Sanctuary pamphlets, biological fact sheets, etc., will be available. The remainder of the floor and wall space on the ground level will contain audio/visual displays as well as aquaria, terraria and specimen displays (see Figure 11). Visual displays and other aids are developed under the direction of the Sanctuary Manager, with actual production and/or loan arrangements made through consultants and area and national institutions. A small library will also be on this floor.

The major purpose of the display area of the visitors center is to acquaint the visitor with general concepts of estuarine ecology, the National Estuarine

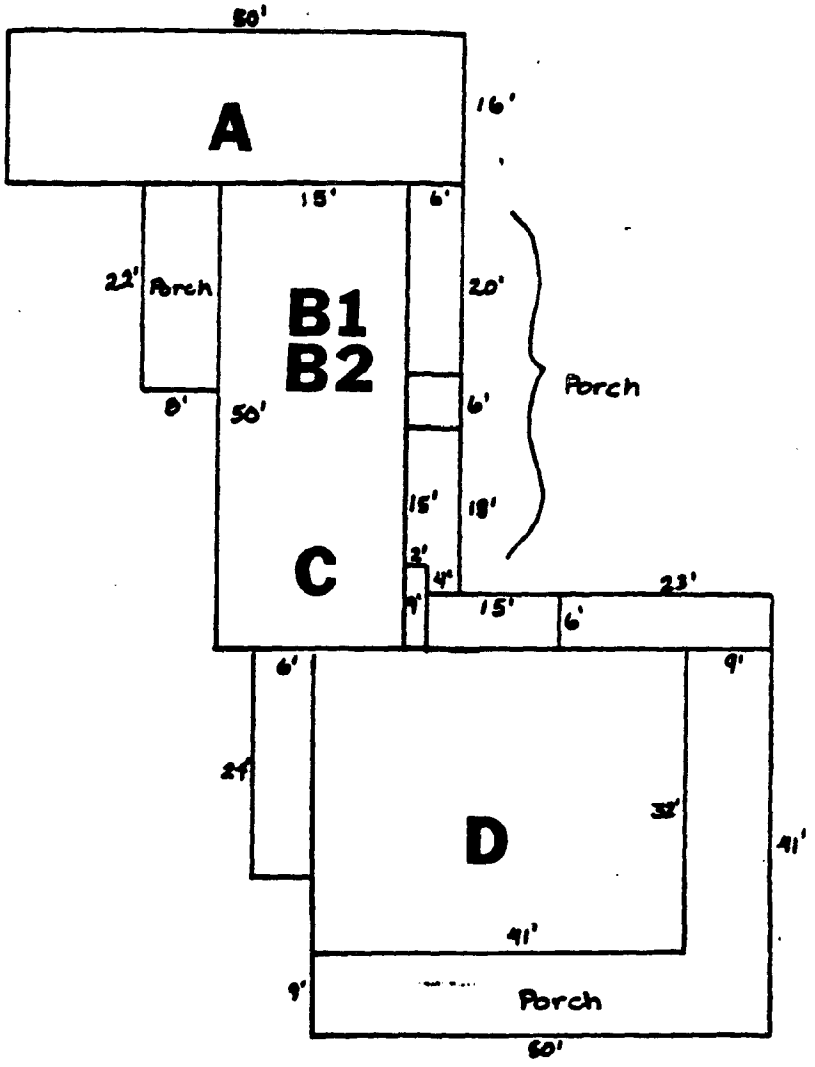


Figure 10

WELLS NATIONAL ESTUARINE SANCTUARY

BUILDING UTILIZATION PLAN (1) [tentative]

SCALE: 1"=20'

Main Farm House

A - Visitors Center
B-1 Classroom Space
B-2 Sanctuary's Manager's Residence & Office
C - Laboratories
D - Display Area and Library

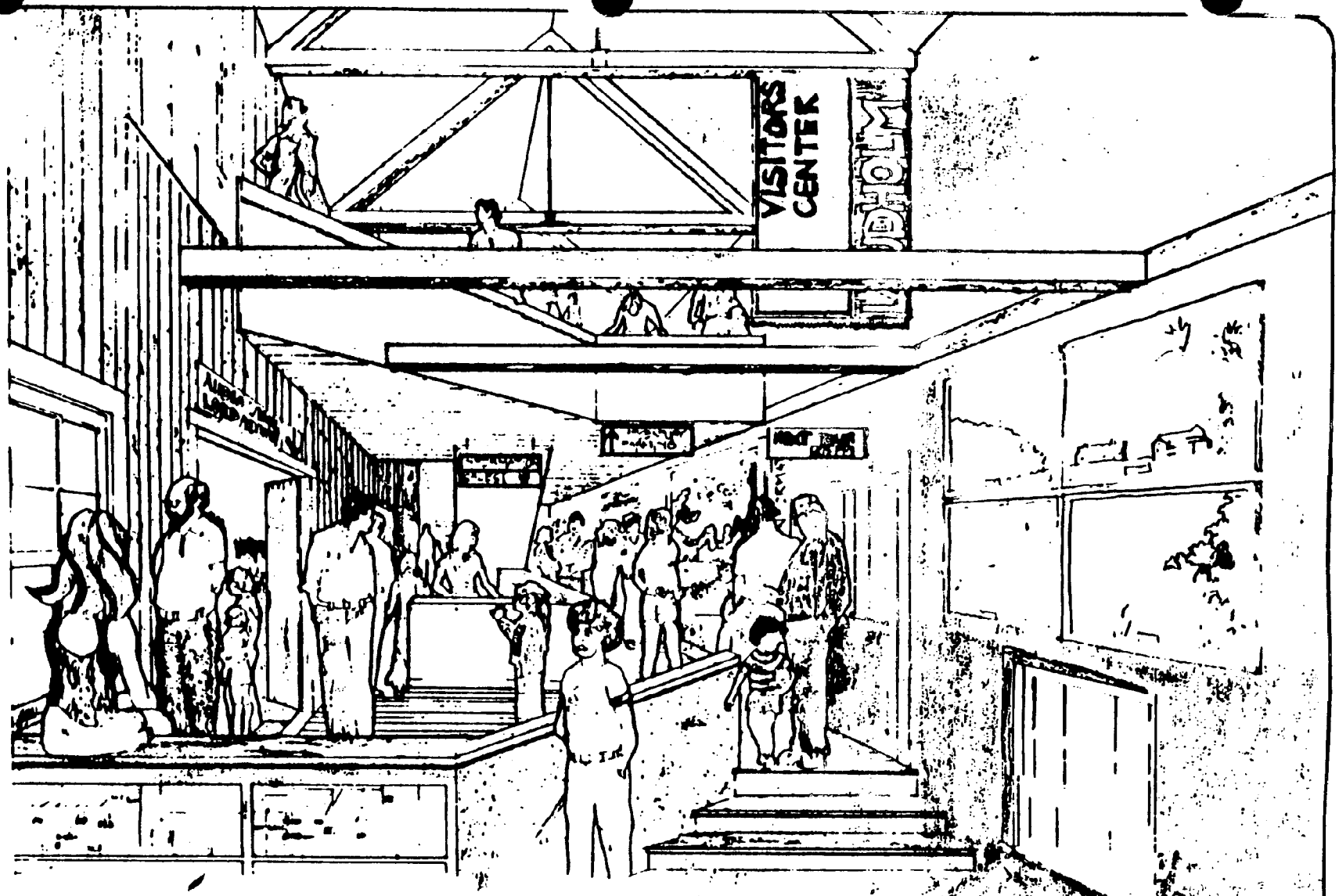


Figure 11

WELLS NATIONAL ESTUARINE SANCTUARY
Visitor's Center Rendering

Sanctuary program and specifically with the ecology of the Wells Estuarine Sanctuary. The visitors center will be oriented toward encouraging people to utilize the interpretive trail system or attend a guided program to gain first hand knowledge of the estuarine system.

A mezzanine in the visitors center will contain a small concession area where books, pamphlets and other materials and items germane to natural sciences and the Sanctuary itself will be sold. Adjacent to the visitors center in the ell to the main house will be a classroom and lecture area for small groups. In addition, a 1,000 square foot area of the main barn adjacent to the visitors center will be converted to a 200-seat auditorium for making presentations to larger groups.

Management Activities

1. By 1986 the town will prepare detailed plans for renovating and equipping the visitors center.

2. In the spring of 1986 the Sanctuary Manager will begin to solicit loans of displays, graphics, etc.

3. In 1986 the Town will begin renovations to main house and selected out buildings to provide for the manager's residence, office and equipment storage space, and laboratory. (Detailed cost estimates are not available because the buildings will not be acquired until 1986.)

4. The Town and State will analyze and decide on the most appropriate mechanism to operate the Center. The management options include the Town, the State, or a private conservation organization.

6. Recreational Areas

Objective

To establish a low intensity seasonal recreational area incorporating interpretive trails, beach access, parking and picnic/play areas.

Description

Laudholm State Park, a 198 acre tract of undeveloped fields, woodland, wetlands, dune and beach, was acquired by the Maine Department of Conservation in 1969. The State obtained the park property for the purpose of establishing a low intensity public beach, trail system, picnic sites, and general play areas. In 1986 the State will increase its holdings when it purchases land in Phase Two valued at $250,000. This land will be purchased for inclusion as a part of the Estuarine Sanctuary

A conceptual development plan, (see Appendix 1) for the park provides for vehicular access from Skinners Mill Road to a contact station. Parking fees would be collected there and information rules and Sanctuary literature dispensed. From the contact station, vehicles would be directed to one of two 70-car parking areas -- one primarily for beach users and the other for picnic, play area and Sanctuary trail areas. Play areas would be developed in the existing open field nearest the park entrance and picnic sites would be located on the fringe of the fields and in shallow wooded areas on the northerly edge of the fields. Interpretive trails will be located along the Little River, to the edge of the marsh and to Laudholm Beach via a broadwalk with an interpretive station across the marsh. Sanitary and maintenance facilities will be appropriately located.

Once developed by the Bureau, the State Park will be operated and maintained by the Bureau on a seasonal basis, generally from May to September. The Bureau and Town have agreed, moreover, through their Memorandum of Understanding, that the park's trails and beach areas may be managed by the Town for Sanctuary purposes (interpretation and research primarily) during the October-April period.

Staffing for the State Park is likely to include: Park Manager, Park Ranger, Park Receptionist, and Lifeguards. These are all seasonal positions, ranging from an 11-week tenure for the lifeguards to 28 weeks for the Park Manager.

Management Activities

1. All management activities related to the recreational development of this area are contingent upon the availability of development funds. At this time no State funds are allocated for this use.

2. In 1985-6 the Town, with consent from the Department of Conservation, will begin partial trail development on State land.

7. Access to the Sanctuary and Related Support Facilities

Objectives

To provide optimum accessibility to the Sanctuary and clear direction to Sanctuary visitors regarding the facilities available.

To provide administrative and support structures that meet the long term needs of the Sanctuary and its visitors without creating undue environmental or aesthetic harm.

Description

Primary access to the Sanctuary's resources/facilities and parking are located on Town and State owned lands. The FWS does operate their Refuge headquarters on Rt. 9 but this will be secondary to the Town's visitors' center. The vehicular access points to the Sanctuary are via Lower Landing, Mile, Laudholm Farms and Skinners Mill Roads from Routes 1 and 9.

The Sanctuary visitors center parking area is operated year-round as is the small parking area at the FWS office. A State Park parking area will operate from May through September when the Park is developed.

The State Park, the town Sanctuary visitors center, and the FWS headquarters require visitor and administrative support facilities such as office space, manager's residence, equipment storage, sanitary facilities, etc. These are described in Management Activities section number 5.

Management Activities

1. In 1986 four one foot by three feet signs will be made by Laudholm Trust and installed on wooden posts by the Town of Wells in conformance with Maine's Uniform Highway Advertising Sign Law. These will be placed on Routes 1 and 9 and Laudholm Farms and Skinners Mill Roads directing visitors to the Sanctuary.

2. In 1986-87, the Town will construct a two acre parking area and foot path for Sanctuary visitors to service the Sanctuary visitor center.

8. Surrounding Land Uses

Objective

To monitor and where possible influence development that will be harmful to the Sanctuary and its resources.

Description

The effects of existing land uses and land use changes within the drainage area of the Sanctuary are beyond the ability of the Sanctuary to manage.

The primary responsibility for both planning and regulating land uses surrounding the Sanctuary is vested in the Town of Wells. (See Appendix 6.) Wells is governed by the Town Meeting form of government whereby plans and ordinances are adopted by plebescite and carried out by elected and appointed boards and employees.

The land use pattern immediately surrounding the Sanctuary has, in some instances, adversely affected refuge marshes by destroying valuable upland buffers and wildlife habitat. To the east of the Sanctuary, the Drakes Island and Wells Beach oceanfront area consists primarily of seasonal or converted to year-round "cottages" built on a former sand dune area. The major impact of this area on the Sanctuary include people, domestic pets, extensive traffic and the seawalls that accelerate beach erosion. The highest density land use within the watersheds of the Sanctuary is in the area between U.S. Route 1 and the Maine Turnpike. This area is heavily developed for commercial, seasonal commercial and residential use, with some industrial usage near the Wells Turnpike exit. Farther inland, west of the Turnpike, land use is primarily rural residential, with lot sizes averaging over an acre. This area is regulated by local zoning and subdivision controls to prohibit development which would adversely impact water quality.

Further development and use of land adjacent to the Sanctuary and within its watershed will be prevented from impacting Sanctuary resources by the network of laws and regulations described in Appendix 6, which delegate the control of land use to State and local authorities. In addition, Town of Wells zoning provides for low intensity development in areas west of the Turnpike and further prohibits development in close proximity to the Webhannet and Little Rivers. There is little land available for development adjacent to the Sanctuary itself and redevelopment at higher densities is not allowed.

Management Activities

1. The landowners of the Sanctuary will install signs and fences, where appropriate, to notify the public as to the location of Sanctuary lands. In particular signs will be located on Drakes Island and Skinners Mill Roads. Numerous signs already exists on FWS land.

2. The Sanctuary Manager will work closely with the Town planning board on reviewing developments that could adversely effect the Sanctuary.

SECTION III:
ACCESS

ACCESS

The location of the Wells Sanctuary between the heavily travelled U.S. Route 1 and high density seasonal development along Wells and Drakes Island Beaches make it accessible, both physically and visually. The Sanctuary abuts in excess of a mile of several public roads and is viewed panoramically or in vistas from over 4 million vehicles per year.

With so much potential access and exposure, the objective of assuring public access to the estuarine sanctuary becomes one of managing access to focus attention on the research and educational aspects of the area without attracting so much traffic that these values are diminished.

Access for Education and Interpretation

There are three public access points to the Sanctuary proper. The primary Sanctuary access is via U.S. Route 1 to Laudholm Farms Road. A directional sign is located at the intersection of Route 1 and Laudholm Farms Road, and a larger sign identifying the Sanctuary is on the Farms Road at the entrance to the Sanctuary. (U.S. Route 1 is a three-lane, Federal Aid Primary road, the major toll-free north - south artery in Southern Maine and Laudholm Farms Road is an 18-foot wide paved town road). Directional signs at the entrance to the Sanctuary will direct automobiles to parking areas for the Visitors Center, trail system and State Park. Access from the parking area to Sanctuary facilities will be provided by a footpath, about 300 meters in length, to the main buildings. All major trails and pedestrian beach access will be from either the Visitors Center or State Park parking areas. A group tour drop-off and handicapped parking will be located adjacent to the visitors center.

The second access point is from Route 9 at the Rachel Carson Wildlife Refuge headquarters. The headquarters has a small trail system available to the public.

The third major access point will be from Route 1 on Skinners Mill Road. When the park is developed, park users who arrive by vehicle will be required to pay a "parking fee" for use of one of the two seventy car parking lots. Access to the Sanctuary trail system, Visitors Center and beach can be gained through the State Park.

In addition to these major points of access, several visual access points with sign displays, highlighting estuarine ecology and describing the Sanctuary will be located at high-volume pedestrian facilities abutting and overlooking the Sanctuary. These will be located at Town-owned public parking lots used for beach access and will be designed to provide the uninformed pedestrian about the ecology of the estuary and with general information about the Wells National Estuarine Sanctuary, including directions to and programs at the Visitors Center.

Three guided trails in the southern part of the Sanctuary (See Figure 12) may be developed if there is a demonstrated need. In the event they are developed, the on-site Managers or Sanctuary Docents will offer guided tours. These will be coordinated through the Sanctuary Manager.

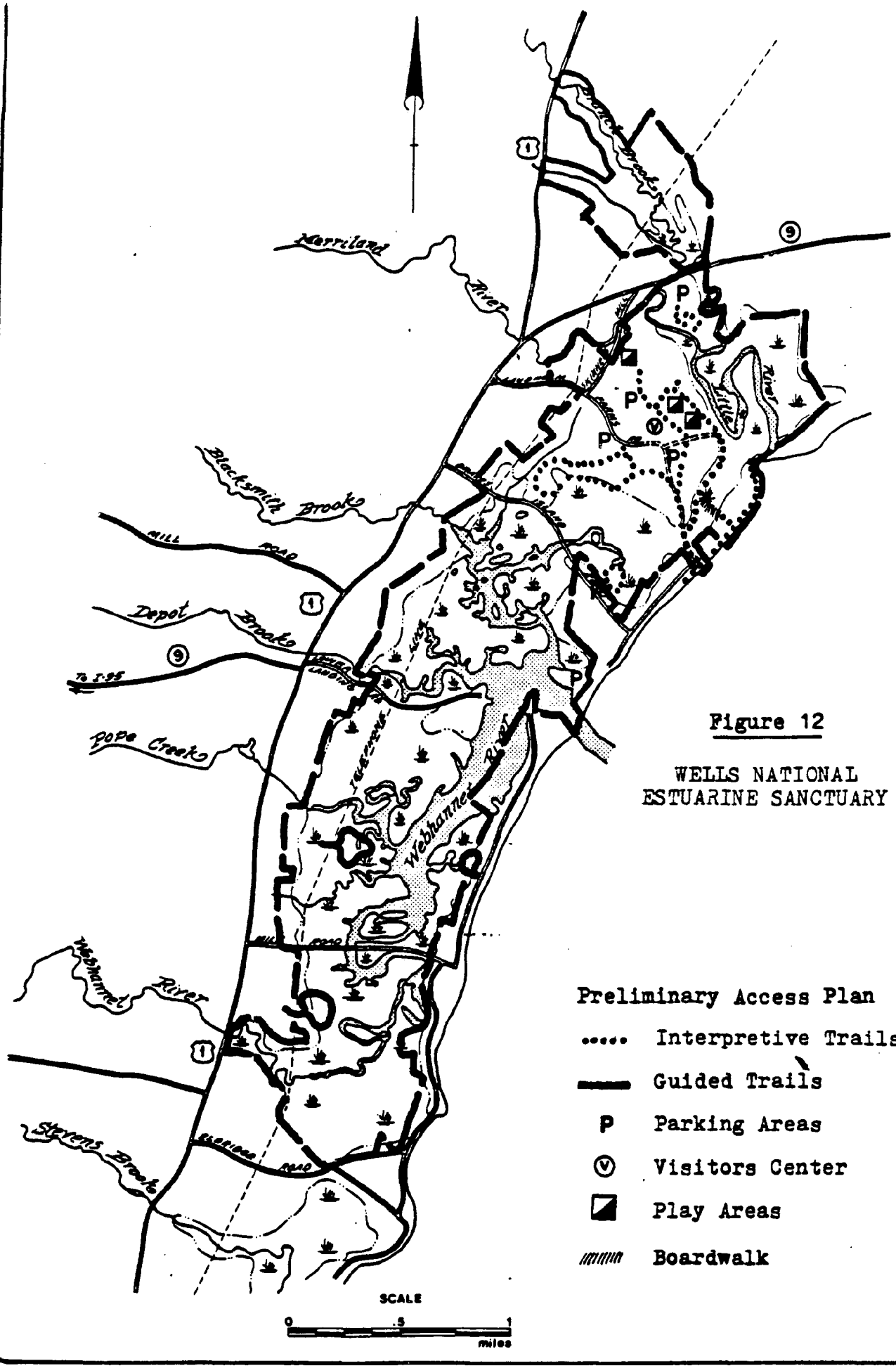


Figure 12

WELLS NATIONAL
ESTUARINE SANCTUARY

Preliminary Access Plan

..... Interpretive Trails

Guided Trails

P Parking Areas

Visitors Center

Play Areas

Boardwalk

Access for Research

Specific research stations, such as the marsh areas south of Mile Road or north of Drakes Island Road, may be reached by foot from the upland areas, by automobile along paved highways or by boat. Small boat access to the Sanctuary is available via small boat ramps at the end of Lower Landing Road in Wells Harbor. The shallowness and narrowness of the estuaries, however; serves to discourage all but shallow draft craft such as canoes and day-sailors.

Access for Other Uses

Other than Sanctuary uses involving trail use and beach recreational use, the majority of pedestrian access is expected to be for the seasonal activities of recreational shell-fish digging and hunting. These latter activities are controlled by permit and/or license.

Management of Public Access

There are both existing and needed controls governing access to and use of the Sanctuary. Certain casual uses such as pedestrian use of the Sanctuary, hiking, etc. will be unconditional, though in sensitive environmental or research areas, uses will be prohibited by signs or temporary fencing. For most uses of the Sanctuary, however, some form of oversight or management is needed to insure that users are cognizant of the resources and that their activities are confined to appropriate areas.

Parking fees will be charged for private automobile use and will be used to help defray the costs of operating the Sanctuary. Group bus access will be encouraged.

SECTION IV:
RESEARCH

RESEARCH

The fundamental purpose for establishing the Sanctuary as a natural field laboratory is to encourage estuarine research. This section of the management plan broadly describes the types of estuarine research that are encouraged within the Sanctuary, the manner in which research activities are permitted and the facilities available.

Research Objective

The long term objective of research at the Sanctuary is to provide a thorough understanding of the physical and biological processes that shape and regulate this important ecosystem. The research plan is guided by the goal of the National Estuarine Sanctuary Program to "assist States ... to acquire and manage estuarine areas for long-term research that will provide data over time to improve the coastal management decisionmaking process."

Estuarine research in the aquatic and transitional areas of the Wells Estuarine Sanctuary is the most important activity that will occur in the Sanctuary. The primary objectives of this research effort are:

To promote and facilitate estuarine research in order to better understand the dynamics and relationships of estuarine and ocean waters. Research is aimed specifically at providing answers regarding better management of estuarine and related areas within the Acadian biogeographical zone.

To promote the coordination of private, State, and Federal research in the estuarine environment.

Research Context

The land and water areas of the Sanctuary are managed in a protected, undisturbed status making them ideal sites for long-term research projects. The Sanctuary encourages research that improves coastal resource management decision-making in Maine, New Hampshire and Massachusetts as well as other parts of the nation's coastal zone. Research conducted in the Wells Sanctuary will provide estuarine information useful in the management of similar areas in northern New England. The Sanctuary encourages a wide range of research on U.S. Fish & Wildlife Service lands as well as on the town and State owned lands.

Research in the 1,500 acres included within the Sanctuary's boundaries is intended to enhance our understanding and awareness of the natural processes at work in an estuarine environment. This land area includes extensive salt marshes in the Rachel Carson Wildlife Refuge, a dynamic interface of estuarine and ocean environments on the Little and Webhannet Rivers and transitional areas bordering the wetlands.

The only known organized research efforts at the Sanctuary have been in the area of coastal geology, related botanical inventories, and least tern/piping plover research. These have been conducted through Maine's Coastal Program, the University of Maine, and Maine Audubon. They have identified the Sanctuary as containing some of the best and rarest of sand dune/beach features in Maine. Wildlife inventories and observations conducted by the Fish and Wildlife Service

as part of its management program in the Refuge have indicated an unusually large diversity of bird species in the Sanctuary -- due partly to its diverse undisturbed habitat and partly to its location.

Research Priorities

Three broad research priorities are established for the Sanctuary. These include:

1. Baseline Monitoring Studies - This priority addresses the collection of baseline data related to plants and animals (vertebrates and invertebrates) of the Sanctuary, distribution of biotic communities, hydrologic and geologic features, etc.

2. Ecological Studies - This priority addresses a broad range of characterization studies including:

   Physiological Ecology - Organism function in relation to the environment, e.g. study of plant growth in relation to salinity.

   Evolutionary Ecology - The ecological study of adaptation, e.g. life history patterns of salt marsh invertebrates.

   Population Ecology - The regulation of populations and population interactions e.g. predator-prey relationships.

   Community Ecology - The study of assemblages of plants and animals and the factors that allow their coexistance e.g. study of why species diversity in salt marshes is limited.

   Ecosystem Processes - Study of nutrient cycling and energy flow exchanges between the abiotic and biotic components of the ecosystem e.g. nutrient flux between salt marsh and tidal creeks.

3. Coastal Management Issues - This priority addresses a wide variety of complex coastal issues such as the relation of salt marsh productivity to fisheries; effects of sedimentation, filling and dredging in estuarine areas; estuarine responses to man-induced changes.

Research Programs

A wide variety of research tasks are encouraged to fulfill the research priorities described above. These include both new and ongoing research.

New Research

Nutrient and Water Chemistry - Collection of periodic water chemistry and nutrients samples. Dissolved oxygen, salinity, temperature, nitrates and phosphates samples taken at high and low tide, at different locations in both estuaries as well as water chemistry samples taken in the Gulf of Maine.

Hydrological Flows - Analysis of water movement in both the Little and Webhannet Rivers using flow meter readings made at high and low tides on a monthly basis.

Vascular Plants - Preparation of vascular plant species list, relative population levels and location data. (Species biology on selected estuarine species is an adjunct to this task.)

Salt Marsh Productivity - Analysis of the primary and secondary productivity of the salt marshes in the Webhannet and Little Rivers.

Bacteria - Collection of monthly bacteria samples from the Webhannet and Little River estuaries and the ocean waters off Laudholm Beach.

Algae and Invertebrates - Collection, via plankton nets, on a monthly basis at high and low tide to determine quantity and quality of algae and invertebrates (both mature and immature). (This includes species identification and population levels for each sample.)

Insects - Analysis of species biology and population dynamics of salt marsh insects including the greenhead fly and mosquitos.

Comparative Physiology - Preparation of comparative studies between the Webhannet and Little Rivers and among other estuaries along the Maine and New Hampshire coast.

Ongoing Research

Currently several agencies and organizations are conducting research in the Sanctuary. This research includes:

Black Ducks and Waterfowl - The Wells National Estuarine Sanctuary is a prime wintering area for black ducks in southern Maine. During the spring and summer, an estimated 12-15 pairs of black ducks nest in the Sanctuary. The black duck is a high priority research task because of its declining population in estuarines along the east coast. Specific studies include the black duck's winter feeding activities, winter food supply, disturbance on the wintering ground, population, nesting sites, and fledging success.

Least Terns, Piping Plovers - The Sanctuary has been a nesting area in the past for both species. Since 1977, the Maine Audubon Society has conducted a Least Tern Research and Protection project and more recently began to include Piping Plovers in this program as well. These studies on population dynamics, fledging success, population, food source, and management techniques will continue for both species.

Soft Shell Clam - The Sanctuary provides excellent habitat for the soft shell clams in both estuarine areas. The Department of Marine Resources has conducted studies of the soft shell clam and its predator the green crab.

Fish - The population dynamics of fish, primarily the striped bass, are being studied at the Sanctuary. The DMR also has an active research program on anadromous fishes.

Shorebirds - The Sanctuary is used as a shorebird feeding and nesting area during the spring and fall migration. Studies are being conducted on arrival and departure dates, population levels, and migratory patterns. Cooperative studies on shorebird migration are being conducted with Canadian and American researchers.

Seals - Studies of the Harbor Seals are being conducted in the waters off Kennebunk and Kennebunkport. Studies of the seal's behavior and population dynamics may be conducted in the estuarine area of the Webhannet and Little Rivers.

Sand Transport - The barrier beach that forms the eastern boundary of the Sanctuary is typical of a number of sand beaches in southern Maine. Part of the beach is developed and outside of the Sanctuary, while another portion, Laudholm State Park, is undeveloped and within the Sanctuary. Research is being conducted on the beach profile, erosion and accretion, and sand spit formation. In addition, comparative studies are being conducted on the effects of houses built on stilts and foundation on the movement of sand in the back dune areas.

Research Institutions

In northern New England there are a variety of research laboratories and Universities conducting estuarine, marine biological and oceanographic research. Several of these have major estuarine research components. The Ecosystem Center at the Marine Biological Laboratory in Woods Hole, Massachusetts and the Jackson Laboratory of the University of New Hampshire place considerable emphasis on estuarine studies. Other marine research institutions in the region are the Woods Hole Oceanographic Institute, Northeastern University's Laboratory at Nahant, Shoals Marine Laboratory operated jointly by the University of New Hampshire and Cornell University, the University of Maine's Darling Center, and the Bigelow Laboratory in Boothbay Harbor, Maine. (See Appendix 10)

Research Coordination Strategy

The Sanctuary Manager, with assistance from the Research and Education Subcommittee, requires all researchers performing work in the Sanctuary to prepare and submit an annual abstract describing the research project. These abstracts are then collated and distributed to all interested State and Federal agencies, university departments, and individual researchers working in the Sanctuary.

Provided there is adequate interest, the Sanctuary Manager may decide to convenue an annual meeting of Sanctuary researchers. Researchers can present recent results of their work and review the goals of their project.

Finally, the Research and Education Subcommittee will compile on a six month basis, a list of past and present research projects in the Sanctuary. The Sanctuary Manager is responsible for publishing and distributing the list.

Sanctuary Research and Education Subcommittee

The primary purpose of the Sanctuary Research and Education Subcommittee is to advise the Sanctuary Manager and the Sanctuary Advisory Committee on proposed research activities in the Sanctuary. A secondary purpose is to encourage researchers to perform research in the Sanctuary. The Subcommittee also provides a forum where estuarine research activities in the Acadian Biogeographic region may be discussed and coordinated. The composition of the Subcommittee is described in Appendix 11.

Research Proposals: Review Procedure

The Sanctuary Manager, in consultation with the Refuge and Park Managers, is responsible for coordinating and approving all research activities in the Sanctuary. Only approved research activities may be conducted in the Sanctuary. The following procedure is used to review and approve/disapprove proposed research activities:

1. The researcher, proposing a specific research activity, herein "the applicant", must request a research proposal checklist (see Appendix 12) from the Sanctuary Manager*

2. The applicant completes the form, attaches any additional material necessary to fully explain the proposed research, and submits it to the Sanctuary Manager. (All researchers should submit proposals to the Sanctuary prior to submission to funding agencies.)

3. The Sanctuary Manager, within ten working days, makes copies of the research proposal and sends copies to:

   a) the Refuge Manager
   b) the Park Manager
   c) the Sanctuary Education and Research Subcommittee and
   d) the Coastal Program Manager, State Planning Office
   e) National Estuarine Sanctuary Program Research Coordinator

   Copies will be sent to peer reviewers when possible.

4. Comments by all reviewers must be sent to the Sanctuary Manager within 15 working days of receipt of the material. If supportive comments and no adverse comments are received the Sanctuary Manager will prepare and send a letter of approval/permits to the applicant (see Appendix 13), attaching standard conditions and any special conditions as deemed appropriate.**

   If adverse comments are received from one or more reviewers, the Sanctuary Manager shall notify the reviewers and attempt to negotiate appropriate revisions within 10 days of receiving the comments. The Sanctuary Manager may request a meeting with the reviewers to discuss the proposal in detail. In the event a meeting is required the Sanctuary Manager makes arrangements for the meeting.

   If a settlement cannot be reached, the Sanctuary Manager shall deny permission to undertake the research, clearly explaining the reasons for this decision. The Sanctuary Manager shall provide copies of this letter to each reviewer.

5. In the event the managers cannot amicably resolve the issue the Sanctuary Manager will follow the dispute resolution process described in Section II: Management Strategy.

6. If the applicant's proposal is denied the applicant may either modify the proposal to respond to the comments or withdraw the proposal.

* Pre-proposal coordination meetings are encouraged by the Sanctuary Manager to avoid incompatible research proposals and to facilitate estuarine research in the Sanctuary.

** In the event the proposed activity is deemed sufficiently complicated the Sanctuary Manager may extend the review period. This applies particularly for manipulative research.

Research Facilities and Equipment

The research activities to be conducted in the Sanctuary require certain

laboratory facilities and specific equipment. The research laboratory will be located on the ground floor of the Main Farm House near the Visitors Center. Final laboratory design will occur in 1986 when the building is acquired.

The laboratory will be comprised of four elements:

1. Wet Laboratory
2. Dry Laboratory and Office
3. Stockroom
4. Storage Shed

The specifications for each of these four elements include:

1. Wet Laboratory: A room large enough for four lab benches and a refrigerator and other related equipment; electricity and running water with double sink; adequate ventilation, probably one laboratory hood; a floor of waterproof material, preferably with a floor drain; cabinet and drawer space for storage of small items; and distilled water system with a millipore filtering system.

2. Dry Laboratory and Offices: A room large enough for four tables or side benches; electricity; freezer; cabinets, drawers and desks for three or four persons; and bookshelves and file cabinets.

3. Stockroom: A small room with shelves and cabinets.

4. Storage Shed: At least twenty feet by twenty feet, with large doorway and easy access to the outside.

In addition to the facilities described above there will be small piers located in the Webhannet and Little River estuaries.

Research Prospectus

The Sanctuary has great potential as an outdoor laboratory. With the provision of laboratory facilities and the availability of data from the inventory and monitoring programs, the diversity of natural ecosystems should attract a number of competent scientists to the Sanctuary.

It is important that the Sanctuary staff inform the scientific community of the availability of the laboratory and natural areas for research purposes. The Sanctuary Manager, with assistance from the Research Committee, will prepare a printed prospectus describing the research opportunities, and send this to researchers.

SECTION V:
EDUCATION & INTERPRETATION

EDUCATION AND INTERPRETATION

A primary purpose of the Wells Sanctuary, second only to estuarine research, is the fulfillment of the national goal of public awareness and education. The Wells Sanctuary exerts an aggressive and sustained effort to make the Sanctuary available to the general public and specifically to primary and secondary school groups for educational use.

Education/Interpretation Objectives

1. To teach and demonstrate the importance of an estuarine sanctuary and the need for long term protection of such natural sites;

2. To teach the natural history of estuarine, coastal, and adjacent upland areas;

3. To explore the relationships between people and their environments, both natural and cultural, from the perspectives of biology, geology, history, agriculture, and human ecology, and to encourage constructive use of this information in the public interest; and

4. To demonstrate how research contributes to our understanding of the estuarine environment.

To carry out the objectives of this education plan there are both physical facilities established at the Sanctuary and off-site promotional initiatives to inform and involve the public. Special emphasis is placed on the involvement of local schools.

Both on and off-site interpretive/educational programs of the Sanctuary utilize existing educational and human resources in the region. The Sanctuary's programs complement and augment related programs and facilities nearby. Facilities in the area that complement the Sanctuary include wildlife refuges and wildlife conservation areas containing interpretive trails, though these are limited generally to marsh, marsh-dune or upland systems and none encompass the whole upland-transition-wetland-dune-beach system which makes the Wells Sanctuary so representative of the Acadian region.

The majority of Sanctuary educational and interpretive use is expected to be from primary and secondary schools within York and Cumberland Counties in Maine and Strafford and Rockingham Counties in New Hampshire. The educational outreach effort and Visitor Center displays and graphics will be directed toward a general science/ecology audience typical of junior and senior high schools in the region. The Sanctuary Manager, with the assistance of the Education and Research Subcommittee of the Sanctuary Advisory Committee will conduct an outreach effort aimed at primary and secondary schools in the Southern Maine/New Hampshire area to acquaint teachers and administrators with the Sanctuary and materials and programs available through the Sanctuary.

Education/Interpretation Priorities

Three broad education/interpretation priorities are established for the Sanctuary. These include developing and operating a variety of educational programs that:

1. inform people about estuarine areas and their value;

2. develop and maintain a trail system that allows visitors to gain a first-hand knowledge of estuarine environment;

3. develop and distribute educational brochures and cirriculum guides to local schools, libraries, and related institutions; and

4. on-site programs.

On-Site Interpretation and Education Facilities

A. Visitor Center

A Visitors Center with a small classroom, and auditorium, and exhibits will be located on the first floor of the main house at Laudholm Farm. All traffic destined for the Sanctuary will be guided to the Visitors Center from U.S. Route 1 by a sign on Laudholm Farm Road. Parking for Sanctuary trail and visitor center use will be provided about one-quarter mile from the Visitor Center. Accommodations for the handicapped (ie, parking, trails, access to the display area, etc.) will be provided. (A more complete description of the visitor center is in the Management Strategy section of this plan.)

B. Trails

A network of self-guided and guided interpretive trails and boardwalk afford Sanctuary visitors an opportunity to observe the setting of the estuarine system as well as to view typical examples of plants, land and water forms and animals of the Acadian Biogeographic region. (A more complete description of the trail system are in the Management Strategy and Access sections.)

Educational Tasks

A wide variety of educational/interpretive tasks are encouraged to fulfill the priorities described above. These include preparation of written materials and establishment of educational materials programs.

Educational Materials

Sanctuary Visitors Self-Guiding Package - A brochure and map of the Sanctuary to distribute to all visitors. Written in layman's terms, the brochure will provide general information on the estuarine, salt marsh, sand beach and upland areas including natural and land use history.

Supplementary Packet - For visitors wanting more information on the Sanctuary, a supplemental information packet will contain 1) an ecosystem map of the Sanctuary, 2) species lists of plants and animals, and 3) geological history.

Educational Brochures - A series of educational brochures on the Sanctuary will be made available to the general public. These brochures will present in general terms scientific and ecological concepts of an estuary in the Acadian biogeographical area. The brochures will be well illustrated with photos and illustrations.

Between 1985 and 1988 educational brochures will be prepared on the following topics:

- What is an Estuary?
- Vascular Plants of the Wells National Estuarine Sanctuary
- Algae of the Wells National Estuarine Sanctuary
- Invertebrates of the Wells National Estuarine Sanctuary
- Fishes of the Wells National Estuarine Sanctuary
- Birds of the Wells National Estuarine Sanctuary
- Mammals of the Wells National Estuarine Sanctuary
- Hydrologic Systems in the Wells National Estuarine Sanctuary
- Sand Beach Systems of the Wells National Estuarine Sanctuary
- Geology of the Wells National Estuarine Sanctuary
- Coastal Environmental Laws
- Citizens Involvement in Coastal Land Use Planning
- The History of Laudholm Farm

By the summer of 1985 interpretive trail pamphlets will be prepared to be used both on the trail system as guides and in classrooms as descriptive teaching tools of Sanctuary flora, fauna and geology. The Sanctuary Manager will be responsible for directing the design of brochures using both consultants and volunteers from the Sanctuary Advisory Committee.

Public/Commercial TV & Newspapers - As part of the Sanctuary's educational outreach program, the Sanctuary Manager and Education Director will write articles for the local newspapers as well as appear on TV from time to time to discuss estuarine issues.

Teachers' Guides - The Sanctuary will prepare teachers' guides for three educational levels (grades K-4, 5-8, and 9-12). These guides will explain the biological, chemical, ecological, and geological facts of an estuarine. The guides provide suggested field trips, research subjects, reading material, report projects and discussion topics.

Exhibits - These will include audiovisual displays as well as aquaria, terraria, and specimens, and will offer hands-on opportunities for visitors. Some will be developed on-site; others will be borrowed for temporary display.

On-site Educational Programs

The Sanctuary will offer a wide variety of educational programs. These include:

Field Trips - The Sanctuary staff and trained volunteers will lead guided field trips on the Sanctuary trail systems. Estuarine plants and animals will be identified and their ecology discussed. The level of interpretation will depend upon the age group and education of the party.

Slide Shows - Sanctuary staff will prepare shows on estuaries in the northeast and the Wells National Estuarine Sanctuary.

Guided Research Projects - The Sanctuary staff is available, upon advanced

request, to lead school children and groups on different guided research

projects. For instance, these subjects will include: 1) water flow, 2) estuarine plants and estuarine animals, 3) ecology of the estuary, sand beach, salt marsh, and upland, and 4) human history.

Lectures, Courses, Seminars, and Workshops - A variety of one to multiple sessions of intensive programs will be available, primarily for adults, on subjects such as plants, animals, geology, hydrology, and ecology of estuaries.

Educational Outreach Programs

The Sanctuary will operate an educational outreach program with slide shows, travelling displays, and lectures on estuaries. Staff and volunteers conduct these programs which are available to organizations, citizen groups and schools.

Displays - The Sanctuary will prepare a series of estuarine educational displays including photographs, illustrations, protected species, diagrams, and a small wet tank. The displays will offer hands on opportunities for visitors and students.

Residential Program - If appropriate the Sanctuary will establish a modest residential school either on the Sanctuary lands, or closely associated with the Sanctuary. This will give teachers and students in New England an opportunity to use the Sanctuary grounds and facilities for several consecutive days.

Educational Staff/Volunteers

The Sanctuary Manager, with assistance from the Education and Research Subcommittee, is responsible for coordinating and developing all education activities. If there is a demonstrated need, an Educational Director will be hired provided funding is available to support the position.

The Sanctuary Manager is also responsible for recruiting and training Sanctuary docents, or volunteer teachers, to conduct tours and give lectures at the Sanctuary.

APPENDICES

Appendix 1

Memorandum of Understanding: Wells & the Department of Conservation

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE MAINE BUREAU OF PARKS AND RECREATION
AND
THE TOWN OF WELLS, MAINE
FOR THE
COOPERATIVE ESTABLISHMENT AND MANAGEMENT
OF
THE WELLS NATIONAL ESTUARINE SANCTUARY

ARTICLE 1 PURPOSE

1.1 The purposes of this agreement between the Maine Bureau of Parks & Recreation (hereinafter the "Bureau") and the Town of Wells (hereinafter the "Town") are:

A) To define the relationships and responsibilities of the Bureau and the Town in the establishment and management of the Wells National Estuarine Sanctuary; and

B) To establish a means of resolving conflicts between the Bureau and the Town in the execution of their individual and joint management responsibilities in regard to Laudholm State Park and the Sanctuary.

ARTICLE 2 STATEMENT OF INTENT

2.1 The Bureau owns approximately 200 acres of land, salt marsh and beach in the Town which it intends to develop and operate as a day use State Park, in accordance with the attached State Park Conceptual Development Plan.

2.2 Under a grant from the National Oceanographic and Atmospheric Administration, the Town intends to acquire approximately 300 acres of land and wetland to establish and operate a National Estuarine Sanctuary. Further, the Town intends to include Laudholm State Park and approximately 2,000 acres of salt marsh and fast land owned by the U.S. Fish and Wildlife Service within the boundaries of the Sanctuary.

ARTICLE 3 RESPONSIBILITIES OF THE BUREAU

3.1 Subject to the availability of funds, the Bureau is responsible for the development, operation and maintenance of Laudholm State Park. It will allow the Park to be included in the Sanctuary boundaries.

The Park will be developed by the Bureau at such time as the State of Maine, or other entity, provides the funding necessary to improve the Park pursuant to the conceptual development plan prepared by the Bureau (attached as Exhibit A). Such development plan conceives the construction of vehicular access, two auto parking lots, one bus parking area, sanitary and service facilities, picnic and play areas, nature trails and pedestrian beach access.

Within the cooperative scope of this agreement, and in keeping with purpose and intent of establishing the Sanctuary, the Bureau retains the right to modify the Park's development concept should economic or environmental conditions so necessitate.

3.2 The Bureau will staff and operate the park on a seasonal basis (late spring to late summer) with adequate administrative, service and maintenance employees to ensure adequate security, safety, sanitation and maintenance consistent with its conceptual development plan.

The Bureau will employ a Park Manager whose duties will include the supervision of other Bureau employees at the Park and the day to day operation of the Park.

3.3 The cost of developing, operating and maintaining the Park will be borne by the State of Maine, from Federal, State and other revenue sources.

Revenue from Park parking fees during the time in which the Park is operated by the Bureau will accrue to the State of Maine General Fund.

3.4 The Bureau will participate on a Sanctuary Advisory Committees established for the purposes of advising the major landowners of the Sanctuary on development, operation and research aspects of the Sanctuary.

3.5 The Bureau will make its vehicular access, parking, pedestrian and sanitary facilities available to the Town for Sanctuary uses -- as described in the attached Environmental Assessment -- during the season in which the Park is operated by the Bureau, during normal Park operating hours.

During those periods of the year in which the Park is not operated by the Bureau, the Bureau may lease to the Town, subject to the approval of the Governor, for a nominal sum, the Park's access, parking and pedestrian facilities for Sanctuary access and research uses. The Town must provide adequate assurance of its intent and capability to maintain the Park facilities in a manner acceptable to the Bureau.

Fees collected by the Town for Sanctuary use of the Park facilities when operated by the Town shall be dedicated to the operation and maintenance of the Sanctuary, as approved by NOAA.

3.6 In constructing pedestrian and nature interpretive facilities in the Park, the Bureau will work through the Sanctuary Advisory Committee to incorporate to the extent feasible trail interconnection and estuarine-related interpretive information.

3.7 Should the Town default in the opinion of NOAA in its operational responsibilities in managing the Sanctuary, the Bureau will assume responsibility for operating and maintaining sanctuary trail and research facilities for a minimum of two years upon the condition that and only for so long as funds are and remain in the Town's escrow account for that purpose. Such operation shall be in accordance with the Management Plan approved by NOAA.

During such two year period, the Bureau will make reasonable efforts to seek additional funds to continue Sanctuary trail and estuarine research operations.

3.8 The Bureau will accept title, subject to approval of the Governor, to the Town-owned portion of the Sanctuary in the event of a complete failure by the Town to abide by the terms of its management and operation agreements with the U.S. Department of Commerce, NOAA.

Should the Bureau cease to operate the Sanctuary in a manner consistent with the goals and objectives of the Federally approved Sanctuary Management Plan, the Bureau may be required to transfer title in the Bureau's portion of the Sanctuary (i.e., that portion which was Town-owned but title to which was transferred to the Bureau in accordance with this sub-article) to the Federal Government. In such a case, the State is entitled to compensation according to its interest in the Sanctuary property; or, at the discretion of the Federal Government, the Bureau may be permitted to retain title after paying the Federal Government an amount equal to its interest in the Sanctuary; or the Federal Government may require the Bureau to sell its Sanctuary property and pay the Federal Government an amount equal to its interest in the Sanctuary. Compensation to either the Federal Government or the State shall be computed by applying the respective percentage of participation in the cost of the original project to the current fair market value of the property.

ARTICLE 4 RESPONSIBILITIES OF THE TOWN

4.1 The Town will acquire, develop, operate and maintain the Sanctuary in accordance with the description of the project in the attached Environmental Assessment, the approved Sanctuary Management Plan, and applicable Federal and State regulations.

4.2 The Town will employ a Sanctuary Manager and retain other contractual/staff services to operate and maintain the portion of the Sanctuary in its ownership.

The Sanctuary Manager will be responsible for coordinating and supervising all education and research activities in the entire Sanctuary, and will be responsible for operating and maintaining the Park portion of the Sanctuary during the time the Park is not operated by the Bureau.

During those periods when the Park is operated by the Bureau, the Sanctuary Manager will be responsible for coordinating educational and research activities occurring on Park land in consultation with the Park Manager.

4.3 The Town will appoint a Sanctuary Advisory Committee to advise the major landowners on the development and operation of the Sanctuary.

4.4 The Town will assume full responsibility for controlling access to and maintaining non-structural Park facilities to be used for Sanctuary purposes in the off-season pursuant to a lease agreement with the Bureau.

4.5 Subject to NOAA approval of the terms, the Town will establish an escrow fund to be derived from sanctuary operations' income and donations in an amount adequate to maintain basic Sanctuary access, trail and estuarine research operations and maintenance for a period of two years. Such escrow fund will be assigned to the Bureau for its use in the event the Town ceases to operate the Sanctuary under the terms of this and other agreements.

The Town will retain maintenance responsibility for any accessory uses or structures of the Sanctuary.

4.6 The Town will cede its title to the Sanctuary to the Bureau in the event that it can no longer operate and maintain the Sanctuary pursuant to the Sanctuary Management Plan. Along with title to the Sanctuary, the Town will forfeit all real property and other assets acquired or maintained by the Town for establishing and operating the sanctuary.

ARTICLE 5 MUTUAL AGREEMENTS OF THE BUREAU AND TOWN

5.1 In the event that for fiscal reasons, the Bureau is unable to develop the Park according to its concept plan within 24 months of the signing of this Agreement, the Town may undertake partial development of the Park pursuant to the State Park Concept Plan. Such development by the Town will be specifically for Sanctuary purposes of vehicular access and interpretive trails, beach access and sanctuary facilities.

Any development of the Park accomplished by the Town shall be under the terms of a lease with the Bureau which shall retain the right to location and design approval of any Town-sponsored improvements in the Park.

5.2 Fees generated from use of the Park during the times it is operated by the Town will accrue to the Town for the purposes of operating and maintaining the Sanctuary, subject to approval of specific uses by NOAA.

5.3 Except as within the intent and spirit of the agreement for cooperative management of the Park for Sanctuary purposes, the Bureau has the ultimate authority under State law to develop and operate the Park.

5.4 Nothing contained in this Agreement shall be construed to require either party to perform pursuant to its terms should State or Federal funding necessary for acquisition of the sanctuary or development and operation of the Park not be available for such purposes.

ARTICLE 6 RESOLUTION OF CONFLICTS

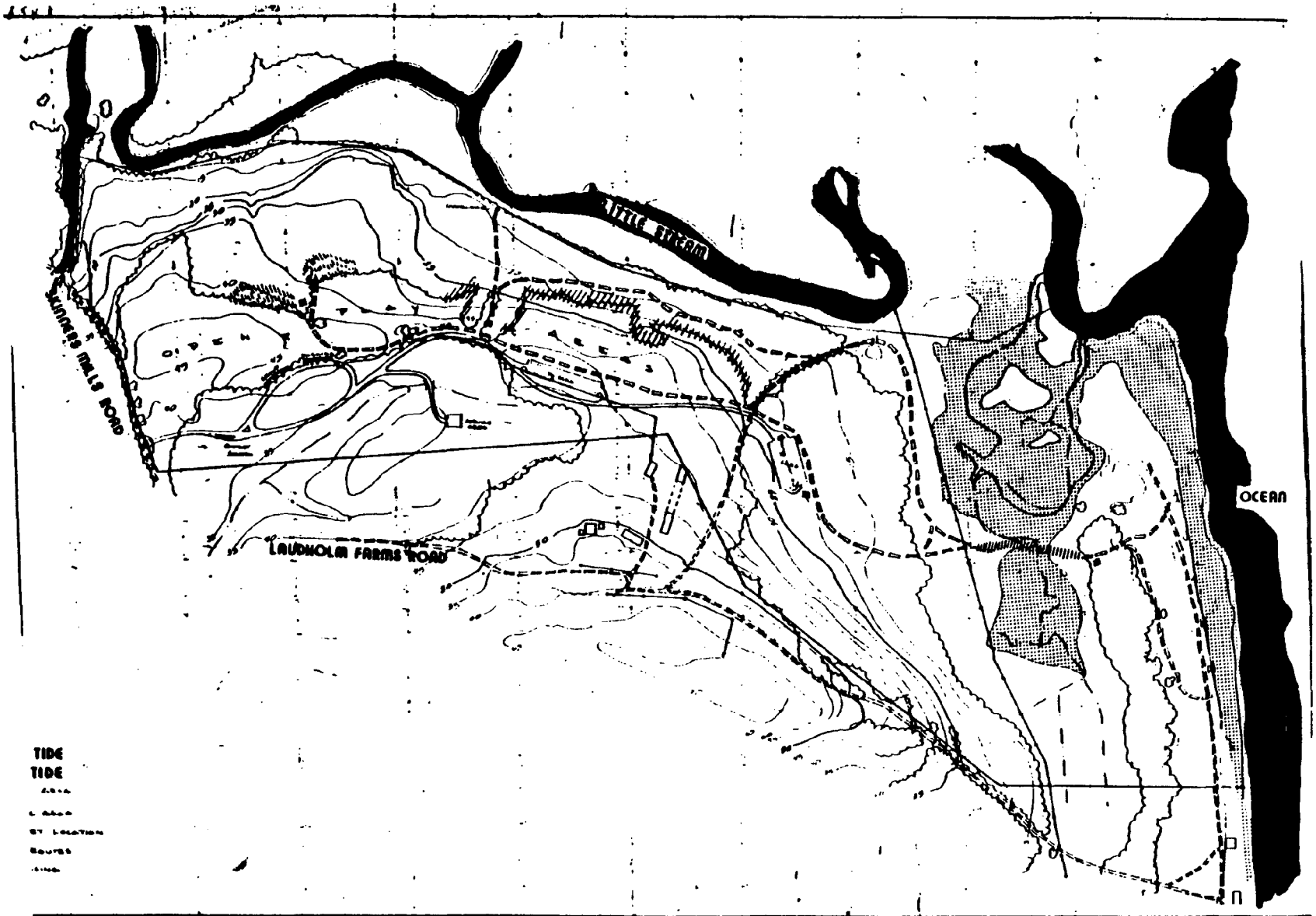
6.1 The Sanctuary Advisory Committee will make recommendations to the Bureau and the Town in cases where policy of logistic differences cannot be resolved at the staff level.

6.2 In the event that the Bureau and Town cannot resolve a conflict based on recommendations of the Sanctuary Advisory Committee, the Director of the Maine State Planning Office will be the arbiter of such dispute.

ARTICLE 7 SIGNATURES

Town of Wells, Town Manager — date

Richard B. Anderson, Commissioner
Maine Department of Conservation — Nov. 18/83 date



POSED STATE PARK
WELLS, MAINE

STATE OF MAINE
DEPARTMENT OF PARKS & RECREATION
CONCEPT PLAN

Appendix 2

Memorandum of Understanding: Wells & the U.S. Fish & Wildlife Service

MEMORANDUM OF AGREEMENT

This Agreement is made and entered into on this 8th day of March, 1984, by and between the United States Fish and Wildlife Service, hereinafter, FWS; the Town of Wells, Maine, hereinafter, Town; the Maine Department of Conservation, hereinafter, Maine DOC; and the National Oceanic and Atmospheric Administration, hereinafter, NOAA, for the purpose of establishing the respective rights, responsibilities and obligations of the FWS, Town, Maine DOC and NOAA regarding property located within the boundaries of the proposed Wells National Estuarine Sanctuary, hereinafter, Sanctuary.

WITNESSETH THAT,

Whereas the Town, the State of Maine and NOAA intend to establish and manage a National Estuarine Sanctuary pursuant to Section 315 of the Coastal Zone Management Act of 1972, as amended, and the implementing regulations at 15 CFR Part 921; and

Whereas the FWS is an agency of the United States Government responsible for the conservation and management of certain nationally significant wildlife resources; and

Whereas the Town and the State of Maine intend to request the inclusion within the boundaries of the Sanctuary of approximately 1,350 acres of marshland and fastland that are owned or are within the approved boundaries of, the Upper and Lower Wells Division of the Rachel Carson National Wildlife Refuge (hereinafter, Refuge), which is managed by the FWS; and

Whereas the State of Maine intends to include Laudholm State Park within the boundaries of the Sanctuary; and

Whereas the parties believe that the purposes of the Sanctuary are substantially compatible with the purposes of the Refuge and fulfill the public education and access goals of the 1981 Rachel Carson National Wildlife Refuge Land Management Plan; and

Whereas according to the policies and regulations of the National Estuarine Sanctuary Program, if Federally-owned lands are a part of or adjacent to the area proposed for designation as a national estuarine sanctuary, or if the control of land and water uses on such lands is necessary to protect the natural system within the sanctuary, the State is encouraged to contact the Federal Agency maintaining control of the land to request cooperation in providing coordinated management policies; and

Whereas according to the policies and regulations of the National Estuarine Sanctuary Program, if designation and management of a proposed national estuarine sanctuary will not conflict with FWS use and control of Federally-owned lands, such cooperation and coordination is encouraged to the maximum extent feasible; and

Whereas the Maine DOC in certain circumstances may assume, with the approval of NOAA, Sanctuary management responsibilities and title to the Laudholm Farm property purchased in part with Federal funds; and

Whereas under 16 U.S.C. § 715i (b), the Secretary of the Interior is authorized, in administering National Wildlife Refuge lands, to enter into agreements with public and private agencies; and

Whereas the Secretary of the Interior is further authorized under the Fish and Wildlife Act of 1956, 70 Stat. 1119, as amended, 17 U.S.C. § 742 et seq., to take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources:

NOW, THERFORE, IT IS MUTUALLY AGREED, as follows:

I. The boundaries of the Wells National Estuarine Sanctuary shall be established generally to include Laudholm Farm and Laudholm State Park as well as the property within the approved boundary of the Upper and Lower Wells Division of the Rachel Carson National Wildlife Refuge, excluding private inholdings, generally from Merriland River/Little River south to Eldrige Road, as shown more specifically on the attached U.S.G.S. quadrangle map.

II. The Town and the FWS will cooperate in the management of the Sanctuary as follows:

A. The FWS shall be represented on the Sanctuary Advisory Committee.

B. FWS lands may be made available to Sanctuary personnel, including researchers, for Sanctuary uses, including educational use, only upon issuance of a special use permit by the Refuge Manager. Such permit shall be issued only to the extent such use is compatible with Refuge objectives, and does not violate any laws, rules, regulations or policies governing the Rachel Carson National Wildlife Refuge, now or as they may be amended in the future.

C. Should the FWS, as required by the Clean Water Act, or any other statute, apply for any wetland, building, or other permit, variance, etc., it is agreed by the FWS and Town that Sanctuary designation shall not be used as a criterion for denial by the Town of any of the above described permits, variances, etc.

D. With the exception of the land and wetlands of the George Lord estate (the Laudholm Farm), the parties agree that the FWS may manage the inholdings now owned or to be acquired by the Town within the boundaries of the Refuge, as an integral part of the Rachel Carson National Wildlife Refuge, and enforce thereon all applicable laws, regulations and policies, on the condition that the management exercised by the FWS over such inholdings shall be consistent with the goals, policies and regulations of the National Estuarine Sanctuary Program. The FWS shall continue to manage such inholdings as described above so long as this Agreement remains in effect.

III. To the extent practicable, the FWS will carry out its activities related to the management of that part of the Refuge included within Sanctuary boundaries consistent with the goals of the National Estuarine Sanctuary Program. The Town, Maine DOC and NOAA will, to the extent practicable, manage the Sanctuary consistent with the Federal authorities

under which the Refuge was acquired and is managed by the FWS. If disagreements between the parties arise concerning the management of the Sanctuary or the Refuge, the parties agree to attempt to resolve such disagreements by discussion among the appropriate officials. If such disagreements are not resolved, either NOAA or the FWS, at the discretion of each agency, may exclude all or any part of the Refuge lands from the Sanctuary. Neither any such disagreement nor any effort to resolve it as described above shall affect the authority of the FWS to manage the Refuge lands in accordance with the laws, regulations and policies governing the National Wildlife Refuge System.

IV. Nothing contained in this Agreement shall be construed as binding the FWS to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of this Agreement for the fiscal year, or to involve the FWS in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.

V. The rights and benefits conferred by this Agreement shall be subject to the laws of the United States governing the Fish and Wildlife Service and to the rules and regulations promulgated under such laws, and Section 315 of the Coastal Zone Management Act of 1972, as amended (16 U.S.C. § 1451 et seq.), and its implementing regulations.

VI. This Agreement becomes effective on the date of signing of the last signature below and will continue in effect until terminated. The Agreement may be terminated by any party upon six months' written notice to the other parties, except that the Agreement shall be terminated upon the exclusion of all Refuge lands from the Sanctuary.

VII. Nothing in this Agreement shall be construed as in any way impairing the general powers of supervision, regulation and control by the FWS of property under its ownership.

VIII. The parties agree that the FWS will undertake no actions to block the Webhannet River estuary so long as this Agreement remains in effect. However, the parties further agree that, in the event that the estuary should be closed by natural processes, the FWS reserves the right to restore flowage.

IN WITNESS WHEREOF, the parties subscribe their names below:

For the U.S. Fish and Wildlife Service:

Howard N. Larsen
Regional Director, Region 5

March 19, 1984
Date

For the National Oceanic and Atmospheric Administration:

Director, Office of Ocean and Coastal Resource Management — 3/8/84 Date

For the Town of Wells:

_____ Date

For the Maine Department of Conservation:

_____ Date

APPENDIX 3

FAUNA: BIRDS, MAMMALS, REPTILES & AMPHIBIANS

Birds of the Wells Estuarine Sanctuary:
A Preliminary Listing

This list of birds was prepared by the U.S. Fish and Wildlife Service. Those birds listed with an "X" have been seen in the Estuarine Sanctuary.

The following coding scheme applies to the list of birds.

Season:

s	- Spring	March 21 - June 20
S	- Summer	June 21 - September 20
F	- Fall	September 21 - December 20
W	- Winter	December 21 - March 20

† - Nesting has occurred on the refuge, within the past 5 years.

* - A species which occurs and/or nests in only one or two locations in the refuge.

Relative Abundance:

a	- abundant	a species which is very numerous
c	- common	certain to be seen or heard in suitable habitat
u	- uncommon	present, but not certain to be seen
o	- occasional	see only a few times during the season
r	- rare	seen at intervals of 2 to 5 years

		s	S	F	W
	LOONS · GREBES				
x	Common Loon	c	o	c	c
x	Red-throated Loon	o		o	u
x	Red-necked Grebe	o		u	u
x	Horned Grebe	u		o	u
x	Pied-billed Grebe	o	o	o	
	FULMARS · SHEARWATERS · STORM PETRELS				
—	Wilson's Storm-Petrel		r	r	
	PELICANS · CORMORANTS				
—	Gannet		o	u	o
—	Great Cormorant	u		u	c
x	Double-crested Cormorant	c	c	c	o
	HERONS · BITTERNS · IBISES				
x	Great Blue Heron	c	c	c	o
x	Green Heron†	u	c	u	
x	Little Blue Heron†	o	u	u	
x	Cattle Egret		r		
x	Great Egret	o	o	o	
x	Snowy Egret	c	c	c	
—	Louisiana Heron	o	o	o	
x	Black-crowned Night Heron†	u	c	c	
—	Yellow-crowned Night Heron	r	r	r	
x	American Bittern	u	u	u	
x	Glossy Ibis	u	u	r	
	WATERFOWL				
x	Canada Goose	c	o	c	u
x	Brant	o			o
x	Snow Goose	o			r
x	Mallard†	u	u	u	u
x	Black Duck†	c	c	c	c
x	Gadwall	r	r	r	
x	Pintail	u		u	o
x	Green-winged Teal†	u	o	u	r
x	Blue-winged Teal†	u	o	u	
x	American Wigeon	o		o	
x	Northern Shoveler	o			
x	Wood Duck	o	o	o	
—	Ring-necked Duck	o		o	
x	Greater Scaup	o		o	o
x	Common Goldeneye	c		u	c
—	Barrow's Goldeneye			r	r
x	Bufflehead	c		c	c
x	Oldsquaw	u		o	u
x	Common Eider	u	u	u	c
—	King Eider				r
x	White-winged Scoter	u		u	u
x	Surf Scoter	u		u	u
	Black Scoter	u		u	u
x	Hooded Merganser	o	o	o	o
x	Common Merganser	o		o	o
x	Red-breasted Merganser	c		c	c
	VULTURES · HAWKS · EAGLES · OSPREYS				
x	Turkey Vulture	o		o	
x	Goshawk	o	o	o	o
x	Sharp-shinned Hawk	u	o	c	o
x	Cooper's Hawk	o		o	
x	Red-tailed Hawk	u	o	u	o
x	Red-shouldered Hawk	u	u	u	
x	Broad-winged Hawk	u	u	c	
x	Rough-legged Hawk	o			o
x	Bald Eagle				o
x	Northern Harrier (Marsh Hawk)	u	o	u	
x	Osprey	u	o	u	
x	Peregrine Falcon			o	
x	Merlin	o		o	
x	American Kestrel	u	u	u	o
	GROUSE · QUAIL · PHEASANT · TURKEY				
x	Ruffed Grouse†	u	u	u	u
x	Ring-necked Pheasant	u	u	u	u
	RAILS · GALLINULES · COOTS				
x	Virginia Rail	o		o	
x	Sora	o		o	
—	Common Gallinule	r		r	
—	American Coot	r		r	
	OYSTERCATCHERS · PLOVERS, SNIPES · SANDPIPERS				
x	Semipalmated Plover	c	c	u	
x	Piping Plover† *	o	u	o	
x	Killdeer†	u	u	u	o
x	American Golden Plover		o	o	
x	Black-bellied Plover	c	c	u	
x	Ruddy Turnstone	o	o	o	r
x	American Woodcock	u	o	u	
x	Common Snipe	u	o	u	
x	Whimbrel	u	o	u	
—	Upland Sandpiper		r	r	
x	Spotted Sandpiper†	u	c	u	
x	Solitary Sandpiper	o	u	u	
x	Willet†	u	u	o	

		S	S	F	W
X	Greater Yellowlegs	c	c	c	
X	Lesser Yellowlegs	u	c	c	
X	Red Knot	o	o	o	
X	Purple Sandpiper	o		o	u
X	Pectoral Sandpiper	u	u	c	
X	White-rumped Sandpiper	u	o	u	
—	Baird's Sandpiper		r	r	
X	Least Sandpiper	u	u	u	
X	Curlew Sandpiper		r		
X	Dunlin	u	o	c	o
X	Short-billed Dowitcher	r		o	
—	Long-billed Dowitcher	r		r	
X	Stilt Sandpiper		u	u	
X	Semipalmated Sandpiper	a	a	a	
X	Western Sandpiper		u	u	
	Buff-breasted Sandpiper		o		
X	Marbled Godwit		r	r	
X	Hudsonian Godwit		o	o	r
X	Ruff		r		
X	Sanderling	u	u	u	o
	AVOCETS · STILTS · PHALAROPES · JAEGERS				
X	American Avocet	r			
X	Wilson's Phalarope	o	o	o	
—	Northern Phalarope	r		r	
	GULLS · TERNS · SKIMMERS · AUKS · MURRES				
X	Glaucous Gull	o		r	o
X	Iceland Gull	o		r	o
X	Great Black-backed Gull	c	c	c	c
X	Herring Gull	a	a	a	a
X	Ring-billed Gull	u	u	u	u
—	Laughing Gull	o	o		
X	Bonaparte's Gull	u	u	u	r
X	Common Tern†	c	c	c	
X	Arctic Tern	o	o	o	
	Roseate Tern	r	r		
X	Least Tern† *	u	u	u	
—	Black Tern		r		
	Razorbill				r
—	Common Murre				r
X	Thick-billed Murre				r
	Dovekie	r			r
X	Black Guillemot	o	o	o	o
	DOVES · CUCKOOS · OWLS · SWIFTS · HUMMINGBIRDS				

		S	S	F	W
X	Rock Dove	u	u	u	u
X	Mourning Dove†	u	u	u	u
X	Yellow-billed Cuckoo†	o	o	o	
X	Black-billed Cuckoo†	u	u	o	
X	Great Horned Owl	u	u	u	u
X	Snowy Owl	r			r
X	Barred Owl	u	u	u	u
X	Short-eared Owl	o	r	o	o
X	Saw-whet Owl	o	o	o	o
X	Whip-poor-will†	u	u	u	
X	Common Nighthawk			u	
X	Chimney Swift	u	u		
X	Ruby-throated Hummingbird	o	o	u	
	KINGFISHERS · WOODPECKERS · FLYCATCHERS · LARKS · SWALLOWS				
X	Belted Kingfisher†	c	c	c	o
X	Common Flicker	c	c	c	o
X	Pileated Woodpecker	o	o	o	o
X	Yellow-bellied Sapsucker	u		u	
X	Hairy Woodpecker†	u	u	u	u
X	Downy Woodpecker†	c	c	c	c
X	Eastern Kingbird†	c	c	c	
X	Western Kingbird			r	
X	Great Crested Flycatcher†	c	c	c	
X	Eastern Phoebe†	u	u	u	
	Yellow-bellied Flycatcher	o		u	
	Willow Flycatcher	o	o	o	
	Alder Flycatcher	u	u		
	Least Flycatcher	u	u	u	
X	Eastern Wood Pewee†	u	u	u	
	Olive-sided Flycatcher	o	o		
X	Horned Lark†	u	u	u	u
X	Tree Swallow†	c	c	o	
X	Bank Swallow	u	u	u	
X	Rough-winged Swallow	o	o		
X	Barn Swallow†	c	c	o	
X	Cliff Swallow†	u	u	o	
X	Purple Martin† *	c	c		
	JAYS · CROWS				
X	Blue Jay†	c	c	c	c
X	Common Crow†	c	c	c	c
	CHICKADEES · TITMICE · NUTHATCHERS · CREEPERS · WRENS				
X	Black-capped Chickadee†	c	c	c	c
—	Boreal Chickadee				r

		s	S	F	W
X	Tufted Titmouse†	o	o	o	o
X	White-breasted Nuthatch†	c	c	c	c
X	Red-breasted Nuthatch†	c	c	c	c
X	Brown Creeper†	c	c	c	c
X	House Wren	o	u	o	
	Marsh Wren	o		o	
	MOCKINGBIRDS · THRASHERS · THRUSHES				
X	Mockingbird†	u	u	u	u
X	Gray Catbird†	c	c	c	
X	Brown Thrasher†	c	c	c	
X	American Robin†	c	c	c	u
X	Wood Thrush†	c	c	o	
X	Hermit Thrush	c	u	u	
	Swainson's Thrush	u		o	
X	Gray-cheeked Thrush		o	o	
X	Veery†	c	c	o	
X	Eastern Bluebird†	o	o	o	
	KINGLETS · WAXWINGS · SHRIKES				
X	Blue-gray Gnatcatcher	o		o	
X	Golden-crowned Kinglet			c	u
X	Ruby-crowned Kinglet	c		c	
	Water Pipit	u		u	
X	Cedar Waxwing†	u	c	c	
X	Northern Shrike	o		o	o
	STARLINGS · VIREOS · WARBLERS				
X	Starling†	a	a	a	c
X	Solitary Vireo†	u	u	u	
X	Red-eyed Vireo†	u	c	u	
	Philadelphia Vireo	o	o	r	
X	Warbling Vireo	o	o	r	
X	Black-and-white Warbler†	c	c	c	
	Tennessee Warbler	u	u	u	
X	Nashville Warbler†	u	u	u	
X	Northern Parula	u	u	u	
X	Yellow Warbler†	c	c	o	
X	Magnolia Warbler†	u	u	u	
	Cape May Warbler	u	o	u	
X	Black-throated Blue Warbler	u	o	u	
X	Yellow-rumped Warbler†	c	u	a	
X	Black-throated Green Warbler†	c	c	u	
	Blackburnian Warbler	u	u	u	
X	Chestnut-sided Warbler†	u	o	u	
	Bay-breasted Warbler	u	u	u	
X	Blackpoll Warbler	u		u	
X	Pine Warbler† *	u	u	u	

		s	S	F	W
	Prairie Warbler	o	o	o	
X	Palm Warbler	u			
X	Ovenbird†	u	u		
	Northern Waterthrush	u	u		
	Louisiana Waterthrush		r		
	Mourning Warbler	o	o	o	
X	Common Yellowthroat†	c	c	c	
	Yellow-breasted Chat		o	o	
X	Wilson's Warbler	u	u	u	
X	Canada Warbler	c	u	u	
X	American Redstart	c	c	c	
	WEAVER FINCHES				
X	House Sparrow†	u	u	u	u
	MEADOWLARKS · BLACKBIRDS · ORIOLES				
X	Bobolink	c	u		
X	Eastern Meadowlark†	u	u	u	o
X	Red-winged Blackbird†	a	a	c	
X	Northern Oriole†	u	u	u	
X	Rusty Blackbird	o		u	
X	Common Grackle†	a	c	c	
X	Brown-headed Cowbird†	a	c	c	o
	TANAGERS · GROSBEAKS · FINCHES				
X	Scarlet Tanager†	u	u	u	
X	Cardinal†	u	u	u	u
X	Rose-breasted Grosbeak†	u	u	o	
X	Indigo Bunting†	u	u		
	Dickcissel				
X	Evening Grosbeak	c		u	
X	Purple Finch†	u	u	c	u
X	House Finch†	c	c	c	c
	Pine Grosbeak			o	o
X	Common Redpoll	o		o	o
X	Pine Siskin	o		o	o
X	American Goldfinch†	c	c	c	c
	Red Crossbill				o
	White-winged Crossbill				o
	SPARROWS · BUNTINGS				
X	Rufous-sided Towhee†	c	c	c	r
X	Savannah Sparrow†	c	c	c	o
X	Sharp-tailed Sparrow†	c	c	c	
	Vesper Sparrow	o		u	
X	Dark-eyed Junco	c		c	c
X	Tree Sparrow	c		c	c
	Chipping Sparrow†	u	u	c	
X	Field Sparrow†	u	u	u	

Mammals of the Wells National Estuarine Sanctuary: A Preliminary Listing

Mammals (observed or reported)

Little brown myotis
Big brown bats
New England cottontail
Snowshoe hare
Eastern chipmunk
Woodchuck
Gray squirrel
Red squirrel
Northern flying squirrel
White footed mouse
Meadow vole
Muskrat
House mouse
Meadow jumping mouse
Porcupine
Coyote
Red fox
Gray fox (probably rare)
Racoon
Fisher
Ermine (short-tailed weasel)
Mink
Striped Skunk
River Otter
White-tailed deer
Moose (rarely pass through)
Harbor Seals

Mammals - range within area but no known reports

Virginia opossum
Masked Shrew
Water Shrew
Smoky Shrew
Short-tailed Shrew
Hairy-tailed Mole
Star-nosed mole
Keen's myotis
Silver-haired bat
Eastern pipistrelle
Red bats
Hoary bats
Gapper's red-becked mouse
Pine vole
Norway rat
Long-tailed weasel
Woodland jumping mouse

Source: Forest Habitat for Mammals of the Northeast by DeGraf, Whitman, Rudis Northeastern Forest Experiment Station & Eastern Region Forest Service, U.S. Department of Agriculture.

Reptiles and Amphibians: A Preliminary Listing

Reported/Identified Reptiles	Species Range of Other Reptiles
Common Snapping Turtle	Stinkpot (Musk Turtle)
Spotted Turtle	Wood Turtle
E. Painted Turtle	E. Box Turtle
Northern Redberry Snake	No. Water Snake
E. Garter Snake	No. Brown Snake
E. Milk Snake	E. Ribbon Snake
	No. Ringneck Snake
	No. Black Racer
	E. Smooth Green Snake

Reported/Identified Amphibians	Species Range of Other Amphibians
Redback Salamander	Blue Spotted Salamander
American Toad	Spotted Salamander
Northern Spring Peeper	Red-Spotted Newt
Bullfrog	Northern Dusky Salamander
Green frog	Four-toed Salamander
Wood frog	Northern Two-lined Salamander
	Greater & Lesser Gray Treefrog
	Northern Leapard Frog
	Rickerel Frog

08d/

APPENDIX 4

FLORA OF THE SANCTUARY

Vegetation in the Wells National Estuarine Sanctuary: A Preliminary Listing

Wetlands

salt meadow cordgrass (Spartin patens)
salt marsh cordgrsss (S. alterniflora)
spike grass (Distichlis spicata)
saltmarsh goldenrod (Solidago sempervirens)
orach (Atriplex hastata)
plantain (Plantago maritime)
black grass (Juncus gerardi)
sea lavender (Limonium nashii)
three-square rush (Scirpus robustus)
common blue flag (Iris versicolor)
slender blue flat (Iris prismatica)
widgeon grass (Ruppia maritima)
glasswort (Salicornia sp.)

Shrub/Scrub

switchgrass (Panicum virgatum)
sweet grass (Hierochloe odorata)
cranberry (Vaccinium macrocarpon)
wild rose (Rosa virginiana)
sweet gale (Myrica gale)
alder (Alnus sp.)

Beach

beach grass (Ammophila breviligulato)
wormwood (Artemesia candata)
Beach Heather (Hudsonia tomentosa)
Earth Star Puffball (Geasiter hydrometricus)
Poison Ivy (Rhus toxicodendron)
Beach Pea (Lathyrus japonicus)
Yarrow (Archillea millefolium)
Evening Primrose (Oenothera sp.)
Seaside Rose (Rosa rugosa)
Dusty Miller (Artemisia stelleriana)
Sandy Sedge (Carex silicea)
Pinweed (Lecha maritima)
Pinweed Aster (Aster Linariifolius)
Toad Flax (Commandra umbellata)
Meadow Sweet (Spiraea latifolia)
Bayberry (Myrica pensylvanica)
Greene's Rush (Juncus Greenei)
Star Flower (Trientalis borealis)
Shad Bush (Amelanchier sp.)
Hard Hack (hairy) (Spireaa tomentosa)
Goldenrod (Solidago rugosan)
Great Angelica (Angelica atropupurea)

Terrestrial

Pitch Pine (Pinus rigida)
White Pine (Pinus strobus)
Red Pine
White Spruce (Picae glauca)
White Birch (Betula papyrifera)
Yellow Birch (Betula lenta)
Grey Birch (Betula populifolia)
Red Maple (Acer rubrum)
Sugar Maple
Mountain Maple
Striped Maple
Red Oak (Quercus rubra)
Red Oak Popular (Populus tremuloides)
White Oak
Scarlet Oak
Cherry (Prunus sp.)
Black Cherry (Prunus serotine)
Eastern Hemlock
Balsam Fir
Larch
Speckled Alder
American Beech

08a/

APPENDIX 5

NATURAL RESOURCES OF THE SANCTUARY

COASTAL GEOLOGY

SOILS

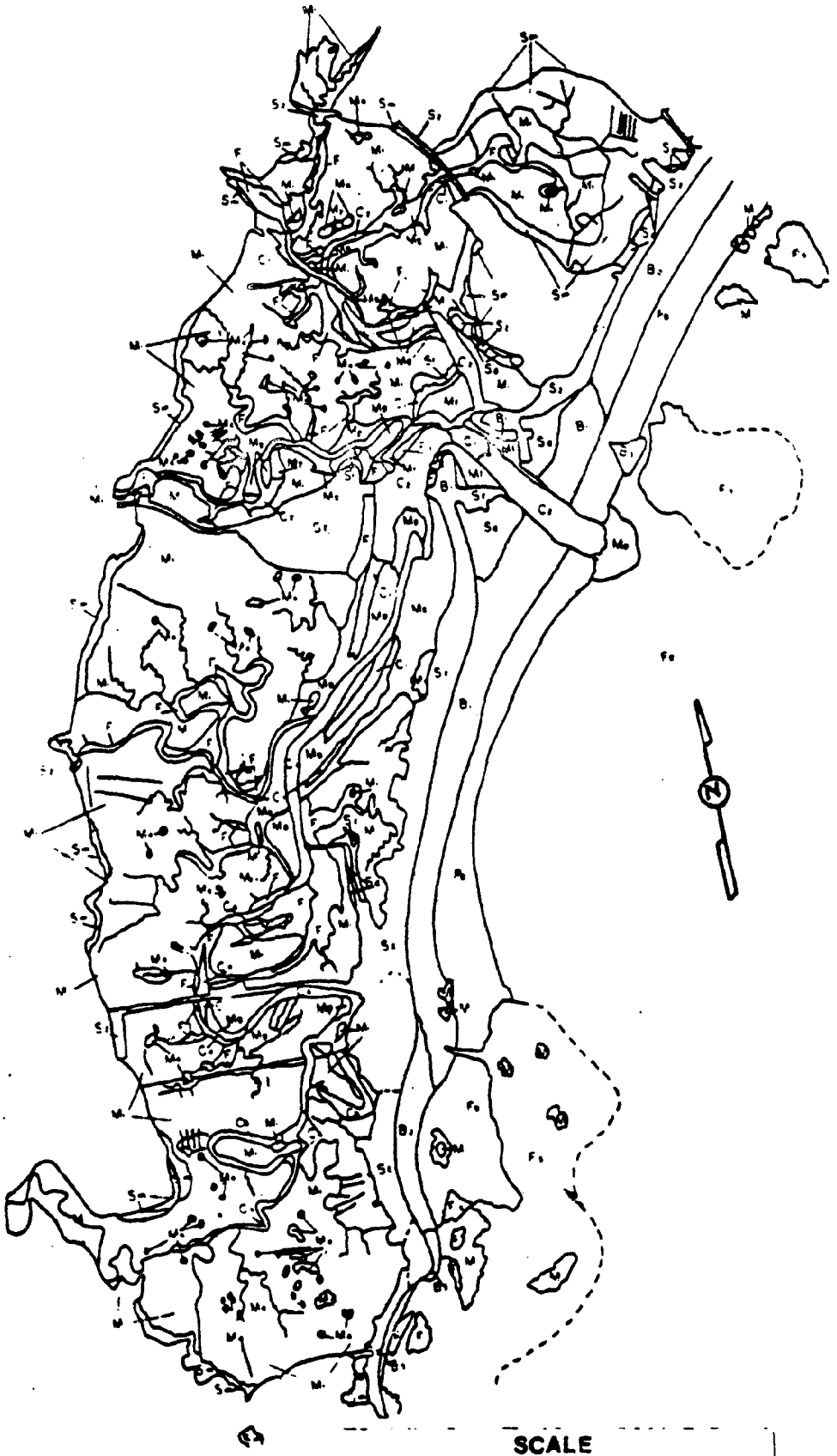
DRAINAGE BASINS

Appendix 5 - 1

WELLS NATIONAL ESTUARINE SANCTUARY

COASTAL GEOLOGY

SYMBOL	GEOLOGIC ENVIRONMENT
	SUPRATIDAL ENVIRONMENTS
Sd	Dunes & Vegetated Beach Ridges
Sw	Fresh-Brackish Water
Sm	Fresh-Brackish Marsh
Sz	Man-Made Land
Sx	Landslide Excavation & Deposits
	INTERTIDAL ENVIRONMENTS
	Marsh Environments
M1	High Salt Marsh
M2	Low Salt Marsh
M3	Marsh Levee
M4	Salt Pannes & Salt Ponds
	Beaches
B1	Sand Beach
B2	Mixed Sand & Gravel Beach
B3	Gravel Beach
B4	Boulder Beach
B5	Low-Energy Beach
Br	Boulder Ramps
Bw	Washover Fan
Bs	Spits
	Flat Environments
F	Mud Flats
F1	Coarse-Grained Flat
F2	Seaweed-Covered Coarse Flat
F3	Mussel Bar
F4	Channel Levee
F5	Algal Flats
F6	Veneered Ramp
	Miscellaneous Environments
M	Ledge
Mc	Fluvial-Estuarine Channel
	Point or Lateral Bars
	Swash Bars
Mf	Flood-Tidal Delta
Me	Ebb-Tidal Delta
Mb	Fan Delta
Md	Spillover Lobe
	SUBTIDAL ENVIRONMENTS
	Flat Environments
Fm	Mud Flat
Fc	Coarse-Grained Flat
Fe	Eelgrass Flat
Fs	Seaweed Community
Fb	Upper Shoreface
Fp	Lower Shoreface
	Channel Environments
C1	High-Velocity Tidal Channel
C2	Medium-Velocity Tidal Channel
C3	Low-Velocity Tidal Channel
C4	Estuarine Channel
C5	Estuarine Flood Channel
C6	Estuarine Ebb Channel
C7	Inlet Channel
C8	Dredged Channel
Cs	Channel Slope
	Tidal Creeks
	Marsh Drainage Ditch
	Unit Boundary
	Approximate Unit Boundary



SCALE

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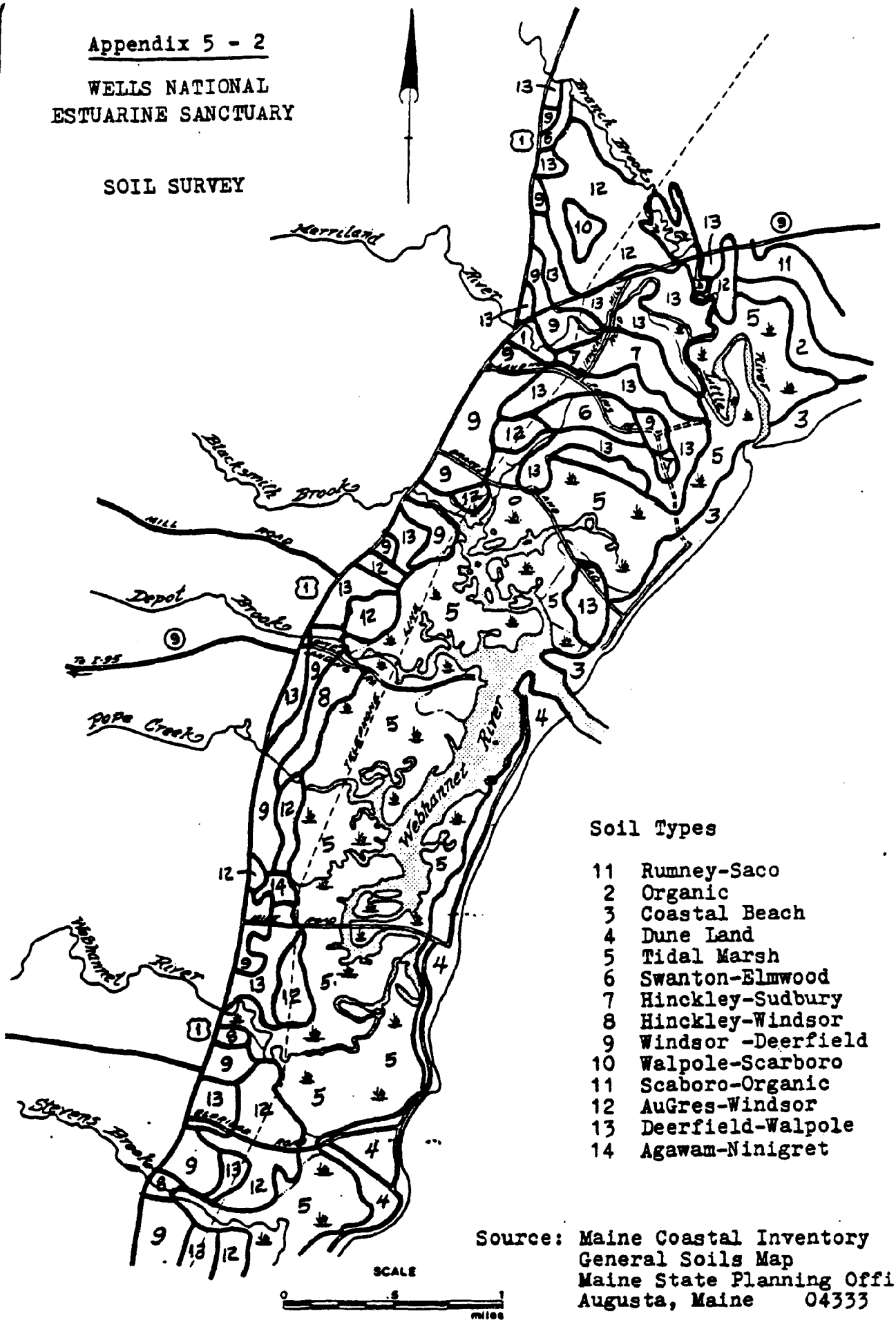
Source: Maine Geological Survey
Augusta, Maine 04333

Appendix 5 - 2

WELLS NATIONAL
ESTUARINE SANCTUARY

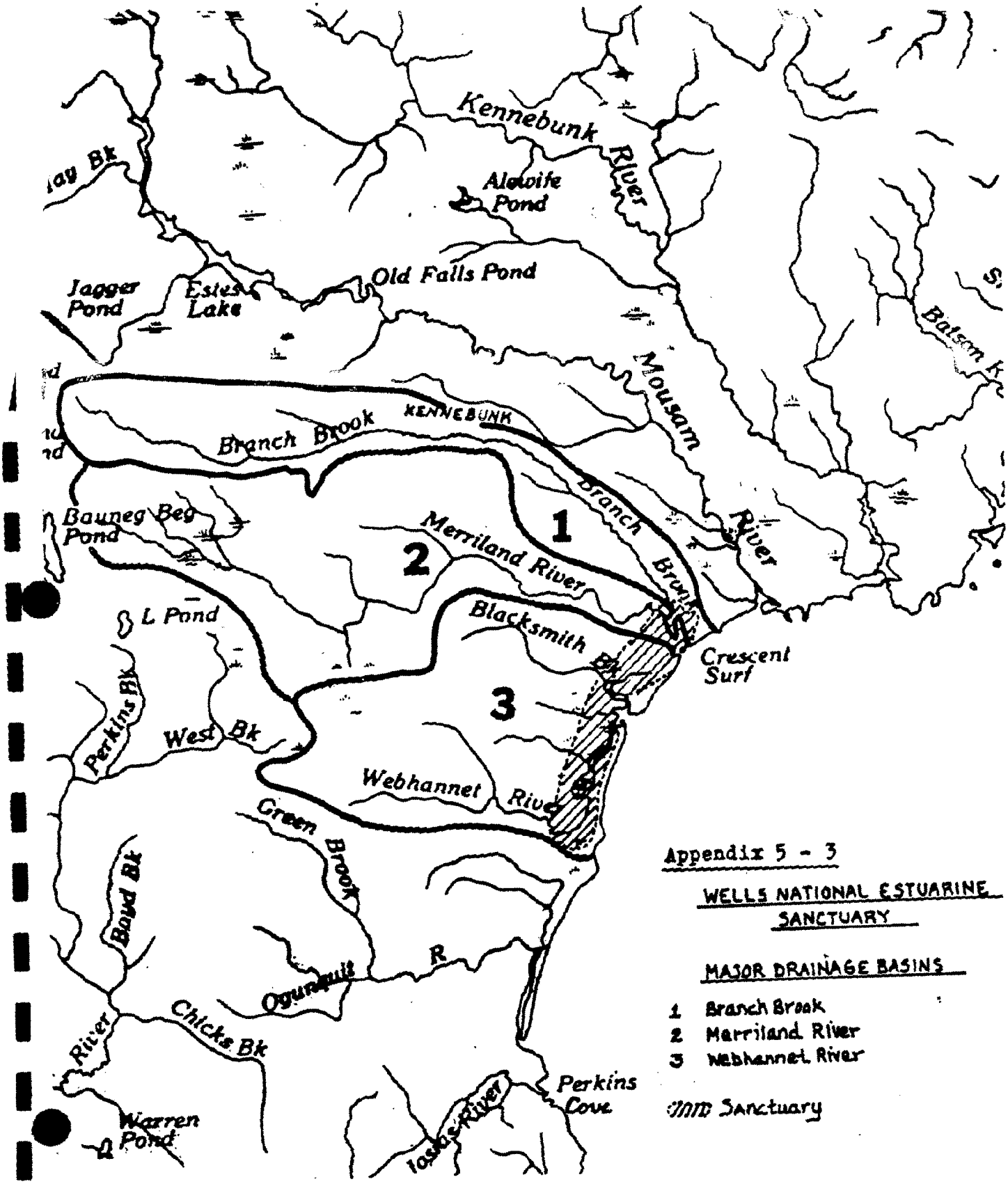
SOIL SURVEY



Soil Types

11	Rumney-Saco
2	Organic
3	Coastal Beach
4	Dune Land
5	Tidal Marsh
6	Swanton-Elmwood
7	Hinckley-Sudbury
8	Hinckley-Windsor
9	Windsor -Deerfield
10	Walpole-Scarboro
11	Scaboro-Organic
12	AuGres-Windsor
13	Deerfield-Walpole
14	Agawam-Ninigret

Source: Maine Coastal Inventory
General Soils Map
Maine State Planning Office
Augusta, Maine 04333



Appendix 5 - 3

WELLS NATIONAL ESTUARINE SANCTUARY

MAJOR DRAINAGE BASINS

1 Branch Brook
2 Merriland River
3 Webhannet River

Sanctuary

Appendix 6

State & Local Laws Protecting Sanctuary Resources

TABLE OF CORE LAWS & ENFORCEMENT AGENCIES

LAW & ENFORCEMENT AGENCY	COASTAL AREAS AFFECTED	USES, ACTIVITIES OR RESOURCES AFFECTED
DEPARTMENT OF ENVIRONMENTAL PROTECTION		
o Bureau of Land Quality Control (207-289-2111)		
1. Alteration of Coastal Wetlands* (38 MRSA 471-478)	Coastal sand dunes, tidal & subtidal lands, swamps, marshes, bogs, beaches, flats, etc.	Dredging, draining, filling, sand moving, erecting a causeway, bridge, marina, wharf, dock or other permanent structure
2. Site Location of Development * (38 MRSA 481-485, 488-490)	Entire coastal area	Developments which may substantially affect the environment
3. Hazardous Waste, Septage & Solid Waste Management * (38 MRSA 1301-1310-B)	Entire coastal area	Siting of facilities and handling, transporting, disposing of hazardous waste, septage, waste oil, solid waste
4. Waterway Development & Conservation (a) (38 MRSA 630-636)	Entire coastal area (excluding LURC jurisdiction)	Hydropower projects

LAW & ENFORCEMENT AGENCY	COASTAL AREAS AFFECTED	USES, ACTIVITIES OR RESOURCES AFFECTED
o Bureau of Land Quality Control (Continued)		
5. Maine Rivers Act (part) (12 MRSA 403)	Designated river segments with unparalleled natural and recreational values, including segments on the following coastal rivers: Dennys, E. Machias, Kennebec, Machias, Narraguagus, Penobscot, Pleasant, Sheepscot	New dams, development or redevelopment of existing dams
6. Nuclear Waste Activity (38 MRSA 1451-1480-A)	Entire coastal area	Siting of a high-level radioactive waste repository or other high-level waste facility, or a low-level radioactive waste disposal facility
o Bureau of Water Quality Control (207-289-3355)		
7. Protection & Improvement of Waters* (38 MRSA 361-367, 372-455)	Marine waters, fresh surface waters, ground water	Discharging of wastes
o Bureau of Oil & Hazardous Materials Control (207-289-2651)		
8. Oil Discharge Prevention & Pollution Control (Coastal Conveyance of Petroleum Act)* (38 MRSA 541-560, 345-349)	Coastal waters, estuaries, tidal flats, beaches, adjacent lands, rivers, streams, sewers, surface water drains & other waters of the State	Handling & conveyance of oil, oil terminal facilities

LAW & ENFORCEMENT AGENCY	COASTAL AREAS AFFECTED	USES, ACTIVITIES OR RESOURCES AFFECTED
o Bureau of Oil & Hazardous Materials Control (Continued)		
9. Hazardous Matter Control (38 MRSA 1317-1319-A)	Any land or water in the coastal area	Discharging of hazardous matter
o Bureau of Air Quality Control (207-289-2437)		
10. Protection & Improvement of Air* (38 MRSA 581-611)	Entire coastal area	Air emissions
LAND USE REGULATION COMMISSION (207-289-2631)		
11. Land Use Regulation* (12 MRSA 681-689)	All unorganized and deorganized townships	Land use and land development activities
** Waterway Development & Conservation (a) (38 MRSA 630-636)	Unorganized parts of the coastal area	Hydropower projects
** Maine Rivers Act (part) (12 MRSA 403)	(see DEP, Land Bureau)	New dams, development or redevelopment of existing dams
DEPARTMENT OF INLAND FISHERIES & WILDLIFE (207-289-3371)		
12. Alteration of Rivers, Streams & Brooks* (12 MRSA 7776-7780)	Rivers, streams & brooks above head of tide and adjacent lands	Dredging, filling, erecting a causeway, bridge, marina, wharf, dock or other permanent structure

LAW & ENFORCEMENT AGENCY	COASTAL AREAS AFFECTED	USES, ACTIVITIES OR RESOURCES AFFECTED
DEPARTMENT OF MARINE RESOURCES (207-289-2291)		
13. Marine Resources Laws: Authorization to adopt regulations* (12 MRSA 6171-6192) (b) Fisheries Conservation Laws (various sections of Title 12) (c)	Coastal waters and flats	Renewable marine resources
BUREAU OF PUBLIC LANDS (207-289-3061)		
14. Submerged & Intertidal Lands (12 MRSA 558)	Submerged & intertidal lands owned by the State	Leasing or granting assignable easements for dredging, filling, erecting permanent causeways, bridges, marinas, wharves, docks, or other permanent structures
MUNICIPALITIES		
15. Mandatory Shoreland Zoning* (12 MRSA 4811-4817)	Areas within 250 feet of lakes, rivers and other surface water bodies	Land use & land development activities
16. Subdivision Law* (30 MRSA 4956)	All organized areas	Dividing a tract or parcel of land into 3 or more lots within any 5-year period

* One of the original eleven core laws of the Coastal Program.
** Numbered under DEP laws.

(a) Consolidated into one law from the LURC Law; Alteration of Rivers, Streams & Brooks Law; Alteration of Coastal Wetlands Law and Site Location of Development Law by the 1983 Legislature for the purpose of simplifying and clarifying requirements for permits.

(b) Regulations adopted pursuant to this authorization (covering aquaculture leases, shellfish, lobsters, crabs, marine worms, alewives, eels, groundfish, herring, salmon, smelt, menhaden, shrimp, marine mammals, gear restrictions and conservation areas), are new additions to the Coastal Program.

(c) Fisheries conservation laws include the following from Title 12: Aquaculture leases, Sec. 6072-6074; Fishways, Sec. 6121-6122; Lobster Conservation, Sec. 6431-6440; Atlantic Salmon, Sec. 6503, 6553-6554; Herring, Sec. 6542 and 32 MRSA 4159; Gear Limitation, Sec. 6571; Shellfish, Sec. 6621; Municipal Conservation Programs, Sec. 6671 & 6673; Scallops, Sec. 6721-6725; Methods of Fishing, Sec. 6951-6952.

1. ALTERATION OF COASTAL WETLANDS LAW (38 MRSA 471-478)

The Alteration of Coastal Wetlands Law is designed to assure that any permanent alteration of a coastal wetland or sand dune system does not:

(a) unreasonably interfere with existing navigational or recreational uses;

(b) cause unreasonable soil erosion;

(c) unreasonably interfere with the natural flow of any waters;

(d) unreasonably harm wildlife or freshwater, estuarine, or marine fisheries;

(e) lower the quality of any waters;

(f) unreasonably interfere with the natural supply or movement of sand within or to the sand dune system, increase the erosion hazard to the sand dune sytem, or cause an unreasonable flood hazard to structures built in, or over any coastal sand dune or neighboring property.

Coastal wetlands are defined as all areas below the landward limit of vegetation that are tolerant of salt water, including all tidal and subtidal lands, and all swamps, marshes, bogs, beaches, flats, or other contiguous lowlands which are subject to tidal action or normal storm flowage. Coastal sand dunes are sand deposits within a marine beach system above high tide, including beach berms, frontal dune ridges, back dune areas and other sand areas deposited by wave or wind action.

Activities regulated by the Coastal Wetlands Law include dredging, draining, filling, or construction of permanent structures on or over any tidal or subtidal lands; and moving of sand or building any permanent structure in, on or over any coastal sand dune. Any such activities require a permit from the Board of Environmental Protection, or from a municipality which has been given permit granting authority by the Board, with the exception of certain activities deemed to have little or no environmental impact.

The Department of Environmental Protection, Bureau of Land Quality Control, should be consulted for specific interpretations, procedures and permit application forms, as well as administrative policies and standards contained in its Wetlands Regulations and Coastal Sand Dune Rules. Before issuing a permit, a completed application is reviewed by appropriate agencies, such as the Dept. of Transportation, Bureau of Waterways; Dept. of Conservation, Bureau of Parks & Recreation; Soil and Water Conservation Commission; Dept. of Marine Resources; Dept. of Inland Fisheries & Wildlife; State Planning Office, and the relevant bureaus within the Department of Environmental Protection. The municipality in which the proposed activity is proposed is also notified and comments requested.

2. SITE LOCATION OF DEVELOPMENT LAW (38 MRSA 481-485, 488-490)

The Site Location of Development Law intends that development projects which may substantially affect the environment, either of the site itself or of the surroundings, are located and operated in a manner that will minimize any adverse impact on the natural environment. "Development which may substantially affect the environment" means any development which occupies a land or water area in excess of 20 acres, or which contemplates drilling for or excavating natural resources, on land or under water where the area affected is in excess of 60,000 square feet, or which is a mining activity, or which is a hazardous activity involving hazardous wastes, hazardous matter, oil or road salt in excess of one ton per year. The definition also includes a structure which occupies in excess of 60,000 square feet of ground area, a project in which buildings and paved and other nonrevegetated areas occupy over three acres of ground area, and subdivision of a parcel of land into five or more lots if such lots make up an aggregate land area of more then twenty acres. Subdivisions within the jurisdiction of the Land Use Regulation Commissions are excluded. Authority for other subdivisions may be delegated by the Board of Environmental Protection to municipalities meeting certain criteria.

Any development which may substantially affect the environment requires a permit from the Board of Environmental Protection. Preliminary notice of intent to file for a permit must be given to the Department and to the municipal officers of any municipality affected, in the case of construction or operation of a hazardous activity.

The Department's Bureau of Land Quality Control should be consulted for specific interpretations, procedures and permit application forms, as well as administrative policies and standards contained in its Regulations Pursuant to Site Location of Development Law. A pre-application conference may be advisable in the case of a large or complex project.

Before issuing a permit, the Department obtains project review by other State agencies having jurisdiction or regulations which may pertain to Site Law projects and which relate to one or more of the project review criteria, as well as by the relevant bureaus within the Department. Other State agencies which may be involved include: Dept. of Human Services, Division of Health Engineering; Dept. of Transportation; Soil & Water Conservation Commission; Maine Geological Survey; Dept. of Inland Fisheries & Wildlife.

For project approval the developer must show:

(a) that he has the financial capacity and technical ability to meet state air and water pollution control standards, and has made adequate provision for solid waste disposal, the control of offensive odors, and the securing and maintenance of sufficient and healthful water supplies;

(b) adequate provision for traffic movement;

(c) provision for fitting the development harmoniously into the existing natural environment, and that the development will not adversely affect existing uses, scenic character, or natural resources;

(d) that the proposed development will be built on soil types which are suitable to the nature of the undertaking;

(e) that the proposed development will not pose an unreasonable risk that a discharge to a significant ground water aquifer will occur; and

(f) provision for safety and reclamation of the land area affected, in the case of a mining activity.

3. HAZARDOUS WASTE, SEPTAGE & SOILD WASTE MANAGEMENT LAW (38MRSA 1301-1310-B)

This law is designed to encourage programs that will reduce the volume of hazardous waste, septage and solid waste production; promote the reuse and recovery of valuable resources; and assure environmentally sound handling and disposal of hazardous waste, waste oil, septage and solid waste.

Under the law, it is unlawful to establish, construct, alter or operate any waste facility without a permit issued by the Board of Environmental Protection. A license is to be granted for a waste facility whenever the Board finds it will not pollute any water of the State, contaminate the ambient air, constitute a hazard to health or welfare, or create a nusiance.

The Board of Environmental Protection is authorized to adopt rules:

(a) for identification, handling, and transportation of hazardous waste (polychlorinated biphenyls are specifically identified as hazardous waste by the statute);

(b) for transportation, collection, storage of waste oil by dealers;

(c) for licensing and operation of hazardous waste facilities; and

(d) governing waste management, including the location, establishment, construction and alteration of waste facilities.

Board rules are to be designed to encourage logical utilization of recoverable resources; minimize pollution of the state's air, land, and surface and ground water resources; prevent the spread of disease or other health hazards; prevent contamination of drinking water supplies and protect public health and safety. In adopting rules the Board is directed to consider economic impact, technical feasibility and such differences as are created by population, hazardous or solid waste, sludge or septage volume and geographic location. Board rules also may require submittal of evidence of the financial capacity of owners or operators of hazardous waste facilities, and of those who transport hazardous waste, as a condition for licensing. The statute itself requires Board approval of a closure plan as a condition for licensing of a facility for hazardous waste mangement. A restrictive covenant on the present or future uses of the land may be required as part of a closure plan.

The law gives the commissioner emergency authority in case of any waste being handled, transported or otherwise dealt with in a manner which may create a danger to public health or safety. It establishes penalties for noncompliance with provisions regarding hazardous waste; and provides for forfeitures, civil liability and recovery of costs of cleanup, abatement or mitigation of any threats or hazards to public health or safety, and recovery of costs of any removal, storage, treatment, disposal or other handling of hazardous waste or hazardous substances.

Applicants for a license to construct, operate or substantially expand a commercial hazardous waste facility are required to give written notice to the municipality in which the proposed facility will be located. Municipalities are given intervenor status in any proceeding for site review.

Municipalities also are authorized to enact police power ordinances dealing with commercial hazardous waste facilities; and to control the handling of solid waste within their boundaries, including collection, transportation or delivery to a specific facility, in order to help make resource recover facilities, including energy production, financially feasible. Each municipality is required to provide a solid waste disposal facility for domestic and commercial solid waste generated within the municipality, and to provide for the disposal of all refuse, effluent, sludge and any other materials from all septic tanks and cesspools located within the municipality.

The Department of Environmental Protection, Bureau of Land Quality Control, should be consulted for specific interpretations, procedures and permit application forms, as well as administrative policies and standards contained in its Solid Waste Management Rules and Hazardous Waste Management Rules.

4. WATERWAY DEVELOPMENT & CONSERVATION ACT (38 MRSA 630-636)

The purpose of this Act is to support and encourage the development of hydropower projects by simplifying and clarifying requirements for permits, while assuring reasonable protection of natural resources and the public interest in use of waters of the State. The Act requires a single application and permit for the construction and reconstruction of all hydropower projects, or structural alteration of any hydropower project in ways which change water levels or flows above or below the dam. Normal maintenance and repair of an existing and operating hydropower project is exempted as long as there is no dredging or filling of any great pond, coastal wetland, river, stream or brook, or any dredging or filling of adjacent land such that any dredged spoil, fill or structure may fall or be washed into those waters.

The permit application process is administered by the Department of Environmental Protection in organized areas and by the Maine Land Use Regulation Commission within its jurisdiction.

Approval of permits is subject to appropriate terms and conditions with respect to factors such as water levels, minimum flows, and fish passage facilities. Approval requires a finding that the applicant has demonstrated:

(a) financial and technical capability to undertake the project;

(b) adequate provisions for protection of public safety;

(c) significant economic benefits to the public, including creation of employment opportunities for workers of the State;

(d) adequate provisions for traffic movement;

(e) consistency with zoning adopted by the Land Use Regulation Commission within its jurisdiction;

(f) reasonable provisions to realize any environmental benefits of the project, and to mitigate adverse environmental impacts;

(g) project advantages which exceed the direct and cumulative adverse impacts over the life of the project, considering soil stability, water quality, wetlands, and the natural environment of any surface waters and shorelands; fish, wildlife, historic and archeological resources; public rights of access to and use of surface waters for navigation, fishing, fowling, recreation and other lawful public uses; flood control benefits or hazards; and hydroelectric energy benefits.

The Department of Environmental Protection or the Land Use Regulation Commission should be consulted for pertinent rules, regulations, procedures and application forms.

5. MAINE RIVERS ACT (part - 12 MRSA 403)

The Maine Rivers Act intends to protect the unparalleled natural and recreational values of certain designated rivers. Section 403 of the Act identifies river segments on which no new dams are to be constructed without the specific authorization of the Legislature, and directs that the significant resource values of these river segments shall not be diminished by additional development or redevelopment of existing dams. The Act further declares that the banned projects will alter the physical and chemical characteristics and designated uses of the waters of these rivers, constitute violations of the State's water quality standards, and are uncertifiable under the U.S. Clean Water Act.

Rivers within the Coastal Area which are given special protection include the Dennys, East Machias, Kennebec, Machias, Narraguagus, Penobscot, Pleasant, and Sheepscot.

6. NUCLEAR WASTE ACTIVITY LAW (38 MRSA 1451-1480-A)

This law sets conditions for State participation in the federal process for siting high-level radioactive waste repositories; provides for transmittal to the President and Congress of a State notice of disapproval of a repository; provides for review by the Department of Environmental Protection and approval by the Legislature of any proposed high-level radioactive waste disposal or storage facility, except a repository or on-site storage of spent fuel from a nuclear power plant; establishes a Low-level Waste Siting Commission and fund; and provides for hearings and review by the Board of Environmental Protection and approval by the Legislature of a proposed low-level radioactive waste storage or disposal facility.

The law requires that prior to initiation of studies of areas with potentially acceptable sites for high-level radioactive waste, a plan for such studies, including any federal plan, shall be approved by the Legislature. The plan is to include socioeconomic and environmental studies, an environmental assessment of site suitability, procedures for establishment of a State review group, and provision for public hearings.

The law requires a permit from the State Geologist for exploring geological formations for the purpose of siting a high-level radioactive waste repository. Any agent of the State is prohibited from (a) participating in site characterization or selection efforts without federal agreement that the process includes preparation of a specific environmental impact statement and compliance with all applicable State and local laws; and (b) participating in site selection or construction of a high-level radioactive waste repository without Legislative approval.

Hearings held in connection with a plan for studying high-level radioactive waste sites, or review of proposed low-level radioactive waste facilities, at a minimum are directed to address technical feasibility, environmental impact, social impact, economic impact, and relation to requirements of State law regarding waste discharge and air emissions, and other laws administered by the Department of Environmental Protection. Hearings regarding a high-level waste site also are directed to address the comparative evaluation of site suitability in relation to sites in other areas. In the case of low-level sites the law provides for municipal participation in the site review process.

7. PROTECTION & IMPROVEMENT OF WATERS LAW (38 MRSA 361-367, 372-455)

The purpose of this law is to control, abate and prevent pollution of all State waters. Administered by the Board of Environmental Protection, the law provides mechanisms to control public and private waste discharge into rivers, streams, brooks, lakes, ponds, marine and tidal waters, and ground water.

A general prohibition is placed on the spill or unlicensed discharge of petroleum products, forest products refuse, potatoes, refuse, junk, garbage, septic tank sludge, waste from watercraft, and on the sale or use of high phosphorus detergents. Log driving on inland waters is banned except, with a permit, for purposes of transport from islands to the mainland. Discharge of radiological, chemical or biological warfare agents, high level radioactive waste and other toxic or hazardous substances identified by the Board is entirely prohibited. Mercury discharges are banned except, under certain circumstances, those predating January 1, 1971.

It is unlawful to discharge waste which, following reasonable opportunity for diffusion, will lower the quality of any State waters below minimum classification requirements. The law prohibits discharge of any pollutant from a private or public source, or installation, operation or maintenance of a surface or subsurface waste water disposal system (including but not limited to holding ponds, surface application and injection systems, except those designed and installed in accordance with the State Plumbing Code), without a waste discharge license from the Board.

Standards of classification are established and the State's fresh surface waters, great ponds, ground water, and tidal or marine waters classified accordingly. The location of solid waste disposal areas adjacent to any classified body of surface water is regulated. Any waste discharge license is issued only upon the condition that the discharge, alone or in combination with other discharges, after best practicable treatment, will not lower actual water quality below its classification. Waste discharges may not lower waters of higher quality than their assigned classification, except on a finding by the Board that such lowering is a result of necessary economic and social development. The Board may revoke, modify or suspend waste discharge licenses in response to changed circumstances or license violations.

Each water quality classification carries specific measurable standards. Standards for the highest classification of fresh surface water, Class A, assure that it can be used for recreational purposes, including bathing, and for public water supplies after disinfection. New discharges to such waters are allowed only if equal to or better in quality than the receiving waters.

Class B waters are intended to be acceptable for recreational purposes, including water contact recreation, for use as potable water supply after adequate treatment, for fish and wildlife habitat, and for industrial water supply in the case of B-2 waters. Class C waters are intended to be satisfactory for recreational boating and fishing, for fish and wildlife habitat

and for other uses except potable water supplies and water contact recreation, unless such waters are adequately treated. Class D waters are assigned only where a higher classification cannot be attained after utilizing the best practicable treatment or control of sewage or other wastes. They may be used for power generation, navigation and industrial process waters after adequate treatment.

Most great ponds are classified GP-A, suitable for recreational purposes, including bathing, fish and wildlife habitat and public water supply after disinfection. Class GP-B are acceptable for recreational purposes, including water contact recreation, for use as potable water supply after adequate treatment, and for fish and wildlife habitat. No new discharges are permitted to great ponds.

All ground water is classified GW-A, of such quality that it can be used for public water supplies. The Board may recommend legislative reclassification to GW-B, suitable for all usages other than public water supplies, in certain circumstances.

Tidal and marine waters fall in five classifications. Class SA is suitable for all clean water usages, including water contact recreation and fishing, and for harvesting and propagation of shellfish and for a fish and wildlife habitat. Class SB-1 is similar but with a lower fecal coliform standard in nonshellfish areas. Class SB-2 is intended to be suitable also for industrial cooling and processing. Class SC is intended for recreational boating, fishing, shellfish harvest for depuration, fish and wildlife habitat and industrial cooling and processing. Class SD is intended for fish migration, industrial cooling and processing, navigation and power generation.

Finally, this law requires authorization by the Legislature for construction of any dam on that portion of the Penobscot River downstream from the Bangor Hydroelectric Co. Dam at Veazie to the southernmost point of Verona Island for any purpose not previously authorized by act, resolve or operation of law.

The Department of Environmental Protection, Bureau of Water Quality Control, should be consulted for specific water quality standards, administrative policies, regulations, procedures and permit application forms.

8. OIL DISCHARGE PREVENTION & POLLUTION CONTROL (Coastal Conveyance of Petroleum Act) (38 MRSA 541-560, 345-349)

The purpose of this law is to protect the coast and all other waters and lands of the State from damage caused by spillage of oil, petroleum products or by-products. Emphasis is on prevention, immediate clean-up of any spills, and provision of compensation for damages to property owners.

The law prohibits the unlicensed discharge of oil into or upon any coastal waters, estuaries, tidal flats, beaches and lands adjoining the seacoast, or into any lake, pond, river, stream, sewer, surface water drainage, ground water or other waters of the State or any public or private water supply. Discharge of waste, refuse or effluent, including natural drainage contaminated by oil, petroleum products or their by-products, may be licensed by the Board of Environmental Protection if it finds that such discharge will be receiving the best available treatment and that existing water quality will not be degraded or any visible sheen created.

The law also requires a permit for installation of any new or replacement underground oil storage facility with a capacity greater than 500 gallons. Licenses are required to transfer oil between vessels and between vessels and terminal facilities, and for anchorage for more than seven days in Maine waters of vessels designed or used to carry oil as cargo. Operation of vessels carrying oil to or from terminals is subject to terminal license conditions while within 12 miles from the coastline. The operation of oil carrying vessels, barges, tugs, motor vehicles and other equipment used by terminals and refineries is also subject to regulation. In addition, safety operating conditions are attached to licenses required of operators of all oil terminal facilities with storage capacity of 500 barrels or more.

The law provides for immediate response to reports of prohibited or unexplained discharges of oil, for removal of prohibited discharges, and for injunction proceedings. It further provides for restoration of any area affected by violation of any provision of the law or any license or permit, by court order.

The Department of Environmental Protection, Bureau of Oil and Hazardous Materials Control, should be consulted regarding administrative Regulations, procedures and permit application forms.

9. HAZARDOUS MATTER CONTROL (38 MRSA 1317-1319-A)

This law authorizes the Board of Environmental Protection to identify by rule any substances that present a present or potential danger to the people of the State or to its natural environment when deposited on land or discharged on or into waters or ambient air; and prohibits the discharge of any such hazardous matter into or upon any waters, land or ambient air of the State unless licensed or authorized under State or federal law.

The law provides for procedures for removal of discharges of hazardous matter, establishes that the responsible party or person causing the discharge is liable for all acts and omissions of its employees and agents, and provides for recovery by the State for expenditures for removal of discharges. A responsible party is not subject to criminal or civil penalities if he immediately reports and removes the discharge in accordance with the rules and orders of the Board of Environmental Protection.

10. PROTECTION & IMPROVEMENT OF AIR (38 MRSA 581-611)

This law intends to control present and future sources of emission of air contaminants to insure the continued health, safety and general welfare, and to protect property values and plant and animal life. Six ambient air quality regions are adopted (Metropolitan Portland, Portland Peninsula, Central Maine, Downeast, Aroostook and Northwest Maine); emission and ambient air quality standards are established, and licenses required from the Board of Environmental Protection for all emission sources. Discharging air contaminants in violation of standards or operating a pollution source without a license is prohibited.

Each region is required to adhere to statewide ambient air quality standards, and to maximum allowable regional increases in concentrations of particulate matter and sulfur dioxide. Ambient air quality standards are established for particulate matter, sulfur dioxide, carbon monoxide, photochemical oxidant, hydrocarbon, nitrogen dioxide, lead and chromium.

Emission standards are established for particulate emissions from general process sources, fuel and solid waste burning sources and incinerators; for sulfur dioxide emissions from sulfite pulping processes; and for hexavalent chromium. Standards are set for sulfur content of liquid and solid fossil fuel, and for vapor control in the case of storage and transfer of liquid petroleum. Emission of visible contaminants is prohibited from specified types of sources, and open burning is prohibited, except for specified types permissible with a permit from the fire warden, forest ranger or local fire prevention official.

The law also authorizes the Board to establish emission standards generally, and emission standards or design, equipment, work practice or operational standards specifically for activities emitting hazardous air pollutants. It also requires the Department of Environmental Protection to carry out and maintain an inventory of hazardous air pollutant emissions.

The Board is directed to grant an air emission license if it finds that the proposed emission will be receiving the best practicable treatment, will not violate applicable emission standards or, alone or in conjunction with existing emissions, ambient air quality standards.

The Department of Environmental Protection, Bureau of Air Quality Control, should be consulted for specific air quality standards, administrative policies, regulations, procedures and permit aplication forms.

11. LAND USE REGULATION LAW (12 MRSA 681-689)

The Land Use Regulation Law empowers the Land Use Regulation Commission to regulate all land use in unorganized areas of Maine. Such areas comprise about five percent of the coastal area, including eight townships, three plantations, and over 200 named islands. The purpose of the law is to extend principles of sound planning, zoning and subdivision control to unorganized areas; to prevent land uses detrimental to the proper use or value of these areas; to prevent intermixing of incompatible activities; to provide for appropriate location of residential, recreational, commercial and industrial uses; to prevent the despoliation, pollution and inappropriate use of the water in these areas; and to preserve ecological and natural values.

The law establishes three major district classifications:

(a) Protection districts, where development would jeopardize significant natural, recreational and historic resources, including flood plains, precipitous slopes, wildlife habitat and other areas critical to the ecology of the region or State;

(b) Management districts, which are appropriate for commercial forest product or agricultural uses; and

(c) Development districts, most appropriate for intensive residential, recreational, commercial or industrial use, or commercial removal of minerals or other natural resources.

The law authorizes the Commission to delineate subclassifications, to determine boundaries and designate the classification of each area thus identified, and to adopt appropriate land use standards and permitted uses. There are eleven Protection subdistricts, three Management subdistricts, and four Development subdistricts in the Commission's adopted Land Use Districts and Standards. The law provides for amendments to district boundaries and standards, and for variances.

A permit from the Commission is required for most development uses. Permit applications must be accompanied by a plan that shows the intended use of the land, proposed changes, and other details as may be required to determine conformance with applicable land use standards. Permit approval requires:

(a) adequate provision for meeting the State's air and water pollution control and other environmental laws, for solid waste disposal, for controlling offensive odors, and for water supply;

(b) adequate provision for parking, loading and circulation of land, air and water traffic, in, on and from the site;

(c) adequate provision for fitting the proposal harmoniously into the existing natural environment;

(d) meeting specified soil suitability standards; and

(e) subdivision approval in the case of an application for a structure on any lot in a subdivision.

The Land Use Regulation Commission should be consulted for boundaries, standards and permitted uses in specific areas, for procedures and permit application forms, and for other rules and regulations.

12. ALTERATION OF RIVERS, STREAMS & BROOKS LAW (12 MRSA 7776-7780)

Under this law no person may dredge, fill, or erect any permanent structure above head of tide, in, on, over or adjacent to any river, stream or brook in such a manner that any dredged soil, fill, or structure may fall or be washed into the water, without a permit from the Department of Inland Fisheries and Wildlife. Permanent structures requiring permits include causeways, bridges, sewer lines, marinas, docks, wharves, dams. Streamside stabilization activities and stream diversions related to construction activities are also regulated.

Permits are granted if it is demonstrated that proposed activities will not:

(a) unreasonably interfere with existing recreational and navigational uses;

(b) cause unreasonable soil erosion;

(c) unreasonably interfere with the natural flow of any waters;

(d) unreasonably harm any wildlife habitat; and

(e) lower the quality of any waters.

The law also identifies and provides special protection to outstanding river segments with special values. A permit application for a crossing of an outstanding river segment is required to demonstrate that no reasonable alternative exists which would have less adverse effect upon natural and recreation features.

The law exempts river, stream or brook crossings connected with public works projects which do not alter more than 300 feet in any mile of shoreline, and private crossings or dam projects which do not alter more than 100 feet, counting both shores, unless such projects are located on an outstanding river segment. Railroad repair and maintenance also is exempted from the permit requirement.

The Department of Inland Fisheries and Wildlife should be consulted for specific interpretations and permit application forms, as well as administrative policies and procedures as in its Regulations for the Processing of Applications for Stream Alterations.

13. MARINE RESOURCES LAWS (various sections of Title 12, MRSA)

The purpose of the marine resources laws is to protect all renewable marine resources, such as fish, shellfish, marine worms, marine plants, and their habitat and supporting ecology. The Commissioner of the Department of Marine Resources is authorized to investigate conditions affecting marine resources and to adopt regulations to promote their conservation and propagation (12 MRSA 6171-6192). Such regulations may limit the taking of marine organisms by time, method, number, weight, length or location; they may concern prevention of gear conflicts, closure of contaminated or polluted areas, and collection of fisheries data. The adoption of regulations may be initiated by declaration of emergency by the Commissioner, by petition, or by the initiative of the Commissioner with the advice and consent of his advisory council.

Regulations adopted pursuant to this authorization which are included in Maine's Coastal Program cover aquaculture leases, shellfish, lobsters, crabs, marine worms, alewives, eels, groundfish, herring, salmon, smelt, menhaden, shrimp, marine mammals, gear restrictions and conservation areas.

Marine resources laws also include specific fisheries conservation laws. The following are included in the Coastal Program:

(a) aquaculture leases (12 MRSA 6072-6074), authorizing of areas in, on and under the coastal waters for scientific research or for aquaculture of marine organisms;

(b) fishways (12 MRSA 6121-6122), authorizing the Commissioner to require fishways in existing and new dams;

(c) gear limitation in the coastal waters of Washington County (12 MRSA 6571);

(d) municipal conservation programs (12 MRSA 6671 & 6673);

(e) methods of fishing (12 MRSA 6951-6952); and

(f) taking of lobsters (12 MRSA 6431-6440), salmon (12 MRSA 6553-6554), herring (12 MRSA 6542 and 32 MRSA 4159), shellfish (12 MRSA 6621), and scallops (12 MRSA 6721-6725).

Marine resources laws and regulations are enforced by wardens of the Department of Marine Resources.

14. SUBMERGED AND INTERTIDAL LANDS LAW (12 MRSA 558)

This law authorizes the Director of the Bureau of Public Lands to lease or grant assignable easements, for terms of up to thirty years, on submerged and intertidal lands owned by the State. The Director may, after consultation with the Commissioners of Conservation, Marine Resources, Inland Fisheries and Wildlife and such other agencies or organizations as he deems appropriate, grant the right to dredge, fill or erect permanent causeways, bridges, marinas, wharves, docks, pilings, moorings or other permanent structures. The rental fee charged for leases is to approximate the fair market rental value of the land, adjusted downward for undesirable uses and upward for desirable uses; depending upon the extent to which the use impairs the future use of the submerged or intertidal land for fishing, fowling, or naviagation; needs to be located on the submerged land; and exploits natural renewable resources of the water. An easement may be granted without valuable consideration, if the use is for charitable purposes; occupies a total of not more than 500 feet of State-owned land; or a total of not more than 2000 square feet for the exclusive purpose of landing or processing shellfish, finfish or natural sea products or related activities; or is for harbor improvement by the Federal Government.

15. MANDATORY SHORELAND ZONING LAW (12 MRSA 4811-4817)

The Mandatory Shoreland Zoning Law regulates land development within 250 feet of lakes and ponds over 10 acres in size, salt water, and rivers and streams from that point at which they drain 25 square miles or more to their outlets. Regulation is accomplished by requiring adoption and enforcement of shoreland zoning ordinances by municipalities.

Individual municipalities should be consulted for information on zoning district boundaries, activities requiring permits, and procedures for permit applications and variances. Municipal ordinances, however, must contain development standards which are at least as restrictive as the Model Shoreland Zoning Ordinance adopted jointly by the Board of Environmental Protection and the Land Use Regulation Commission.

The minimum regulations in the Model Shoreland Zoning Ordinance cover:

(1) permissible land uses in resource protection, limited residential-recreational, and general development areas, and

(2) development standards, as follow:

(a) Agriculture: require manure spreading and disposal to follow specified guidelines and that no tilling occur within 50 feet of the normal high water mark.

(b) Beach Construction: require a permit from the DEP.

(c) Campgrounds: require a 75-foot setback for the placement of all recreational vehicles, and 5,000 sq. ft./vehicle.

(d) Clearing: no more than 30 feet of every 100 feet of shoreline can be cleared within 50 feet of the water.

(e) Erosion and Sedimentation Control: to be accomplished to the maximum extent possible to reduce soil erosion and sedimentation.

(f) Mineral Exploration: require a permit for actions that involve more than minimal ground disturbance.

(g) Piers, dock, wharves, breakwaters, causeways, marinas, bridges over 20 feet long and uses projecting into water bodies: access from the shore shall be on appropriate soils. The location shall not interfere with beach areas and adverse effects on fisheries should be minimized.

(h) Residential Lots: require a Minimum lot size (without sanitary sewer) of 20,000 square feet, minimum shore frontage of 100 feet, and a maximum building coverage of 20%. These same minimum requirements must be met for each additional dwelling unit.

(i) Road Construction: roads are to be constructed in conformance with the standards specified in a U.S.D.A. Logging Road publication. Further, watercourse crossings should be minimized and exposed mineral soil revegetated or stabilized.

(j) Sanitary Standards: subsurface disposal systems must be located on suitable soils, as determined by a State-licensed soil investigator. The State Plumbing Code requirements must be met and facilities must be set back at least 100 feet from the high water mark.

(k) Signs: location, size, and number of signs in Resource Protection and Limited Residential-Recreational Districts are restricted.

(l) Soil: land uses must be located on soils without causing adverse environmental impacts, including severe erosion and mass soil movement.

(m) Structures: all principal structures in Resource Protection or Limited Residential-Recreational Districts must be set back 75 feet from the normal high water mark. The first floor level must be at least two feet above the 100 year flood elevation.

(n) Timber Harvesting:

1. No substantial accumulation of slash is to be left within 50 feet of the high water mark.

2. A filter strip of vegetation must be left between skid trails and the water.

3. Harvesting shall be conducted so as to leave well-distributed tree stands.

4. No single harvesting activity shall create an opening of greater than 7,500 square feet in the forest canopy.

5. No more than 40% of the volume of trees shall be removed in any 10-year period.

(o) Water Quality Protection: no activity may discharge any liquid or material that is harmful to human, animal, plant, or aquatic life.

16. SUBDIVISION LAW (30 MRSA 4956)

The purpose of the Subdivision Law is to require municipal review of any division of a tract or parcel of land in organized territory into three or more lots within any five-year period, whether accomplished by sale, lease, development, buildings or otherwise. Lots of more than 40 acres, lots created by inheritance, condemnation or court order, and gift lots from a relative are exempted. According to an advisory memorandum issued jointly by the State Attorney General's Office and the Maine Municipal Association a subdivision also includes apartments, condominiums, shopping centers, hotels, campgrounds, industrial parks and planned unit developments (June 15, 1972).

Before granting approval of a proposed subdivision, a municipality must determine that the subdivision:

(a) will not result in undue water or air pollution; will not adversely affect the quality or shoreline of any pond, lake, river or tidal waters within 250 feet; and will not adversely affect the quality of groundwater;

(b) has sufficient water available for reasonably forseeable needs and will not cause an unreasonable burden on an existing water supply;

(c) will not cause unreasonable soil erosion or related problems;

(d) will not cause unreasonable highway or public road congestion or unsafe conditions;

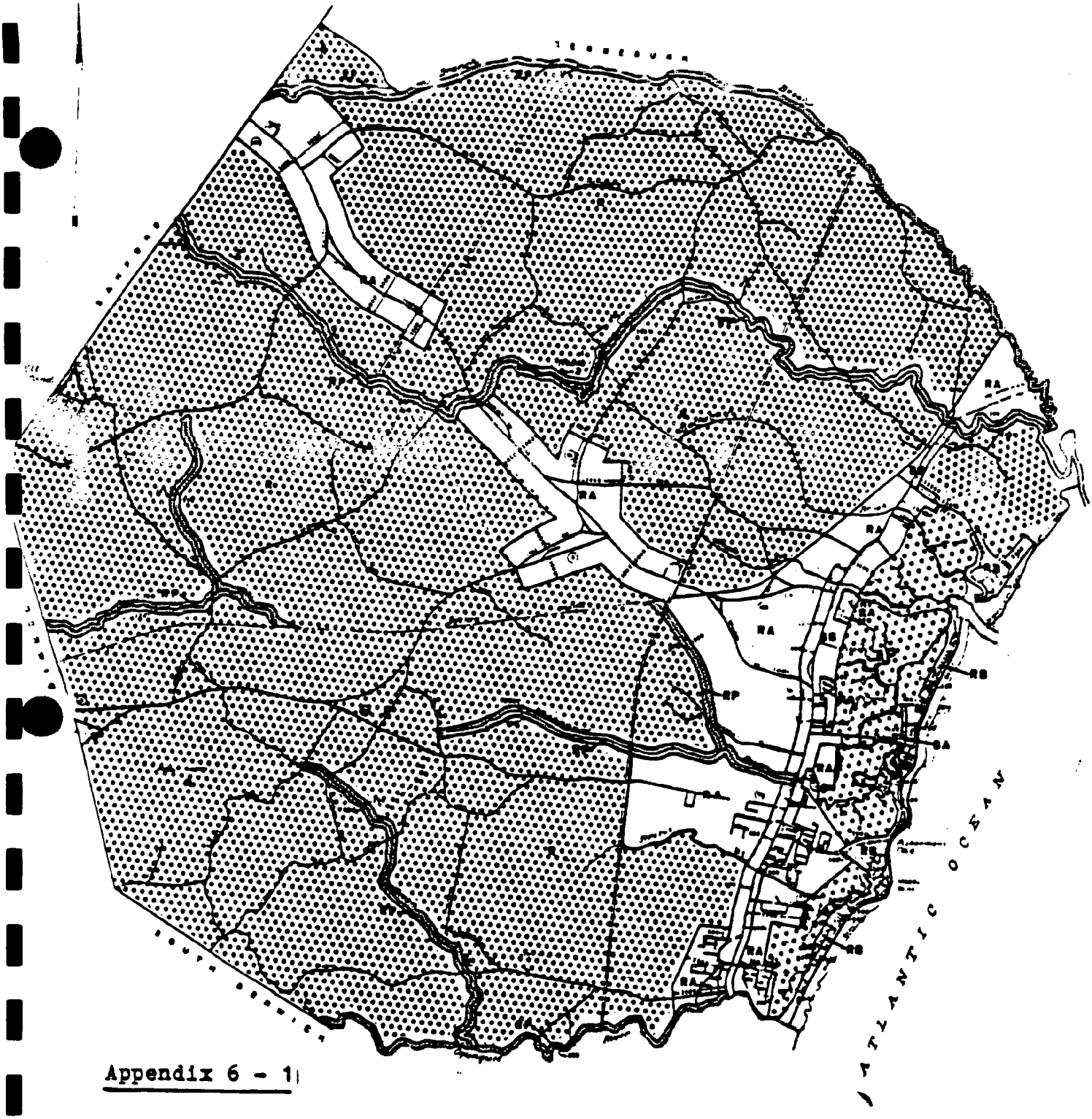
(e) will provide for adequate sewage disposal, and will not cause an unreasonable burden on a municipality for disposing of solid waste and sewage;

(f) will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites or rare and irreplaceable natural areas; and provides for a combined 500 foot lot shore frontage and setback of principal structures in the case of lots fronting on or within 250 feet of river segments with outstanding natural and recreational values designated for special protection;

(g) is in conformance with any-regulation authorized for protecting and assuring access to direct sunlight for solar energy systems, any duly adopted subdivision regulation, and any duly adopted development plan; and

(h) is supported by adequate financial and technical capacity to meet minimum requirements.

The Subdivision Law authorizes municipalities to adopt additional subdivision regulations which may be more restrictive than these specified. Individual municipalities should be consulted for a complete picture of applicable rules, regulations, procedures and review criteria.



Appendix 6 - 1

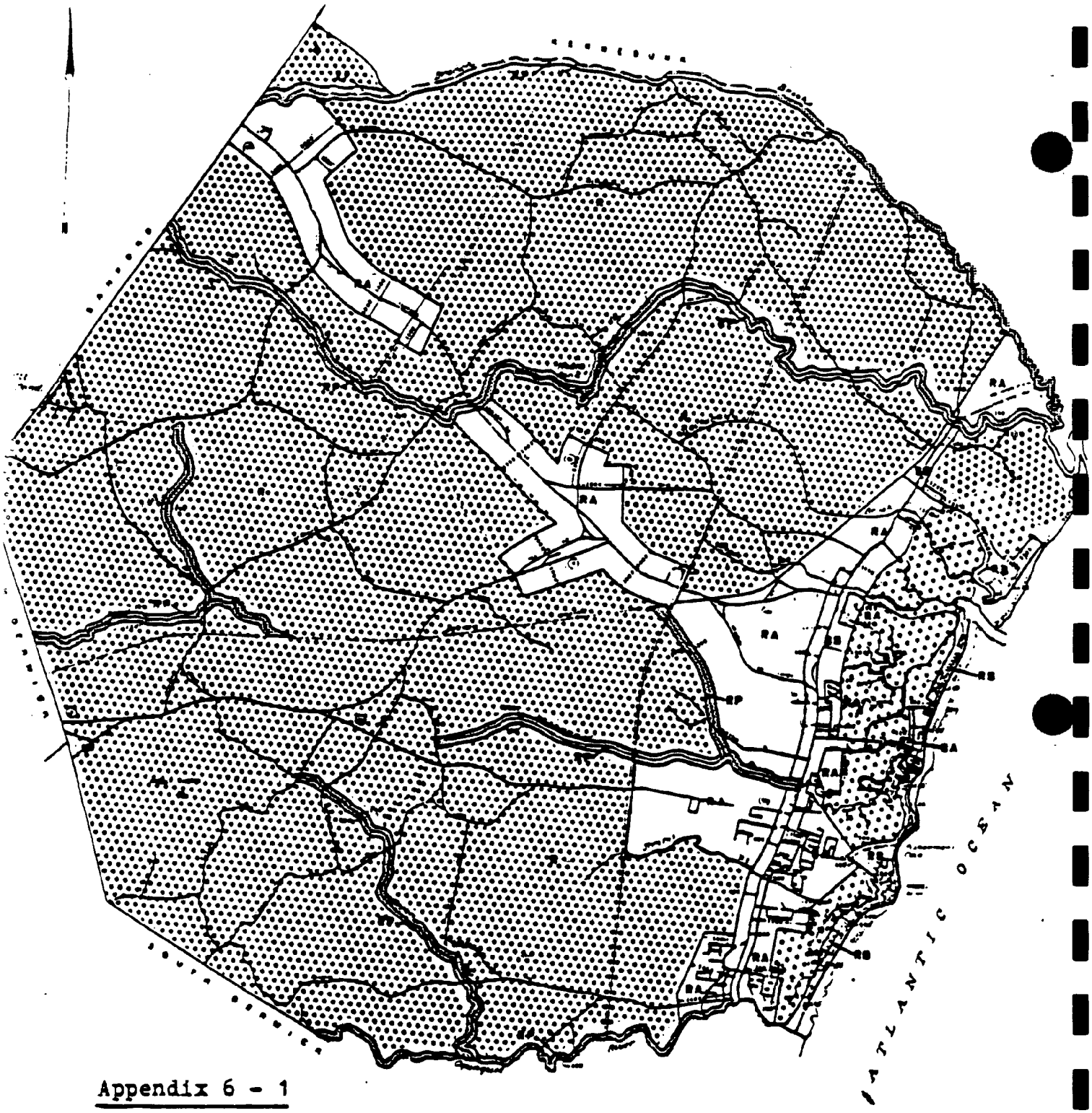
ZONING MAP OF THE TOWN OF WELLS, MAINE.

LEGEND:

RESIDENTIAL DISTRICT A	RA	RURAL DISTRICT	
RESIDENTIAL DISTRICT B	RB		
BUSINESS A DISTRICT	BA		
BUSINESS B DISTRICT	BB	RESOURCE PROTECTION DISTRICT	RP
INDUSTRIAL DISTRICT	I		

0 1 2 miles

August 1984



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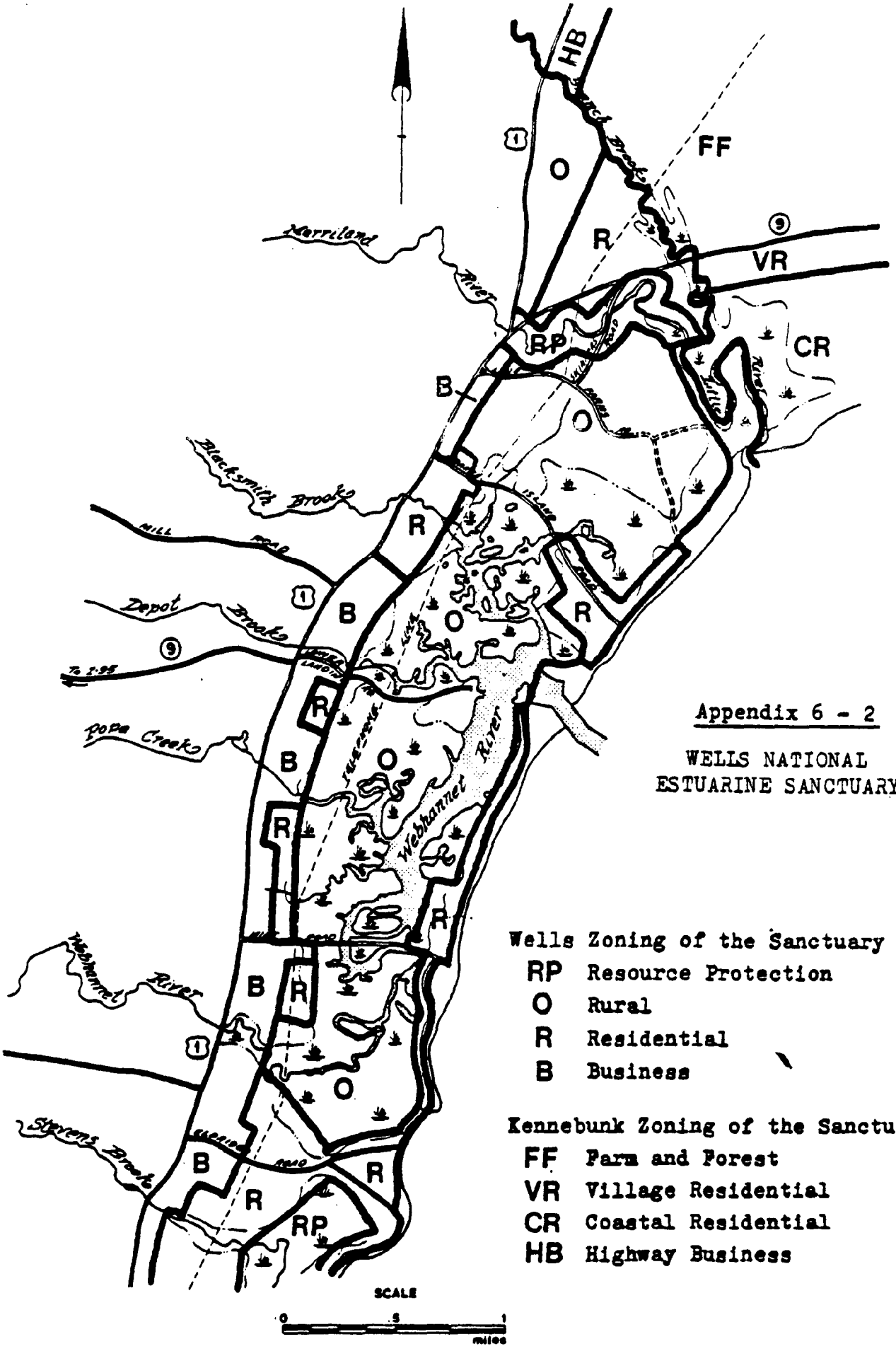

Appendix 6 - 2

WELLS NATIONAL
ESTUARINE SANCTUARY

Wells Zoning of the Sanctuary

- RP Resource Protection
- O Rural
- R Residential
- B Business

Kennebunk Zoning of the Sanctuary

- FF Farm and Forest
- VR Village Residential
- CR Coastal Residential
- HB Highway Business

APPENDIX 7

CURRENT SANCTUARY REGULATIONS: WILDLIFE REFUGE - PUBLIC USE REGULATIONS AND STATE PARK REGULATIONS - RULES FOR STATE PARKS AND MEMORIALS

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RACHEL CARSON NATIONAL WILDLIFE REFUGE
WELLS, MAINE

PUBLIC USE REGULATIONS

Entry by foot into those portions of the refuge not posted as closed is permitted for certain uses specified herein. Visitor hours are dawn to dusk. Sightseeing, nature study, wildlife observation, photography, hiking, snowshoeing, and cross-country skiing are permitted.

Group activities may be confined to areas designated by the Refuge Manager. Advance reservations and permits are required for group activities and there must be at least one adult supervisor for every ten (10) children.

Vehicles are permitted only in designated parking areas. Parking may be restricted to certain purposes and conditions designated by special signs.

Public boat launching and landing are not permitted on the refuge except by special permit.

Alcoholic beverages, nudism, camping, tents, camping trailers, and fires are not permitted on the refuge. Pets are permitted if under control and on a leash not over 10 feet in length.

The possession of any device prohibited by State law and/or deemed a dangerous weapon by refuge officials is prohibited.

Information about the refuge is available from the Refuge Manager, Rachel Carson National Wildlife Refuge, Route 9 East, Wells, Maine 04090 Telephone No. (207) 646-9226.

MAINE DEPARTMENT OF CONSERVATION

Revised
May 1984

BUREAU OF PARKS & RECREATION

RULES FOR STATE PARKS AND MEMORIALS

The following rules and regulations are established by the Bureau pursuant to the provisions of the "Maine Revised Statutes Annotated," Title 12, Section 602.

(1) The use of these areas shall be limited to the purposes for which they are being preserved and to activities determined by the Bureau to be compatible with the intended use of the facility. Sports activities will be confined to areas so designated for that purpose.

(2) The removal, molesting, injury or damage of anything natural, physical or historical within these areas is strictly prohibited. The use of metal detectors on historic sites is prohibited. Metal detectors are allowed in other areas only by written permit.

(3) Intoxicating beverages are not permitted. Disorderly conduct is prohibited. This includes but is not limited to indecent acts, intoxication or coarse language.

(4) Open fires are allowed only in grills or fireplaces provided by the Bureau for that purpose or in the users own equipment which will be confined to areas designated for that purpose. No fires are allowed on beaches.

(5) Pets are allowed only under suitable restraint. Pets must be on a leash not exceeding four feet in length. No pets are allowed on beaches or in Sebago Lake State Park campground. Pets shall not be left unattended.

(6) Wheeled vehicles shall be parked only in places designated for that purpose, conform to posted traffic regulations, be confined to roads designated for that purpose, and otherwise comply with all State vehicle laws.

(7) Refuse must be placed in the containers provided for that purpose by the Bureau.

(8) The discharging of wastes, including soaps and detergents, shall be prohibited except locations specifically designated for that purpose.

(9) Soliciting is prohibited.

(10) The possession and/or use of firearms or weapons is prohibited in all areas between May 1 and October 1. See section 4 for rules regarding hunting and trapping.

(11) Arrangements for group use must be made in advance by contacting the Park Manager. Groups are limited to those areas designated or assigned for that purpose and all groups must be accompanied by a sufficient number of adult supervisors.

(12) Camping: See supplemental section on Camping.

(13) Swimming or boating or water skiing shall be allowed only in areas designated for that purpose.

(14) Activities which endanger persons or property may be restricted or prohibited. The Bureau may evict any person violating these rules or other State law or regulations.

VIOLATION OF RULES & REGULATIONS

Pursuant to Provisions of 12 Maine Revised Statutes Annotated, Section 606.

Whoever violates any of the rules and regulations, or any notices posted, or willfully mutilates, defaces or destroys any monument or markers lawfully erected within the borders of said parks or memorials, shall be punished by a fine of not more than $50 and costs or by imprisonment for not more than 30 days, or by both.

Richard B. Anderson
Commissioner, Department of Conservation

Herbert Hart
Director, Bureau of Parks and Recreation

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Richard B. Anderson
Commissioner, Department of Conservation

Herbert Hamm
Director, Bureau of Parks and Recreation

APPENDIX 8

SANCTUARY ADVISORY COMMITTEE

The Sanctuary Advisory Committee is composed of the eighteen members representing a variety of interests and perspectives.

Organization	# of members	Current Appointee
Selectman, Wells	1 member	Jim Wiggin
Planning Board, Wells	1 member	Mort Mather
Wells Conservation Commission	1 member	Owen Grumbling
Maine Organic Farmers and Gardners Assoc.	1 member	Tim Smith
Drakes Island Association	1 member	Ed Nesky
Marine Educators	1 member	Alan Young
Local Landowners	1 member	Mary Kline
State Planning Office	1 member	David Keeley
Department of Conservation Bureau of Parks and Recreation	1 member	Herb Hartman
Department of Inland Fisheries & Wildlife	1 member	Phillip Bozenhard
Department of Marine Resources	1 member	Brad Sterl
U.S. Fish and Wildlife Service	1 member	Al Zelley (Maury Mills)
College Educators	1 member	Tom Lee
Wells Chamber of Commerce	1 member	Joseph Carleton
Secondary School Educators	1 member	Margaret Vose
Parsons Beach Association	1 member	Helen Rivas
Maine Audubon Society	1 member	Leslie Van Cott
National Oceanic & Atmospheric Administration (ex-offico)	1 member	Nancy Foster
	18 members	

Appendix 9

Research Facilities and Equipment

Basic Research Facilities & Equipment include:

1. Wet Laboratory

- refrigerator
- incubator
- drying oven
- aquaria and supplies
- a set of sediment sieves
- 2 or 3 constant temperature chambers
- desk lights
- water carboys

2. Dry Laboratory & Office

- two light microscopes
- three or four dissecting microscopes
- basic library of taxonomic keys
- lab manuals, etc.
- typewriters
- desk lights

3. Stockroom

- Assorted glassware
- dissecting tools
- thermometers
- Hache kits
- chemicals

4. Storage Shed

- Plankton nets
- meters (salinity, ph, dissolved oxygen, current)
- a sixteen foot flat-bottomed boat
- a canoe

APPENDIX 10

RESEARCH & EDUCATIONAL INSTITUTIONS

There are a variety of research and educational organizations that are encouraged to use the Sanctuary. These include:

Agencies & Organizations

a) Federal

Sea Grant Program
National Oceanic & Atmospheric Administration
Fish & Wildlife Service

b) State of Maine

State Planning Office: Critical Areas Program
Department of Marine Resources
Department of Conservation
Department of Inland Fisheries & Wildlife

c) Town of Wells
d) Maine Audubon
e) The Natural Resources Council of Maine
f) The Nature Conservancy
g) Gulf of Maine
h) New England Estuarine Research Society
i) Maine Organic Farmers & Growers Association
j) Stone Environmental School
k) National Science Foundation

l) Colleges -

University of Southern Maine
University of Maine at Orono
Darling Center
University of New Hampshire
Schools Marine Laboratory
New England University
Bates
Bowdoin
Harvard
Cornell
Dartmouth
Boston University
Boston College
Massachusetts Institute of Technology
New England College

m) Institutions -

Maine Biological Laboratories
Bigelow Laboratory

APPENDIX 11

EDUCATION AND RESEARCH SUBCOMMITTEE

The Education and Research Subcommittee of the Sanctuary Advisory Board is composed of eighteen individuals representing diverse educational and research interests.

Committee Members	Educational/Research Interest
Tom Lee - Chairman	Botanist/Instructor
Susan Anghinetti	Environmental Instructor
Jim Armstrong	Retired College President
Garrett Clough	Marine Biologist
Richard D'Abate	Retired Past College Vice-President
Will Elwell	Director of Museum
Ken Fink	Geologist
Owen Grumbling	College Professor
Lily Kendall	Marine Docent
Robert Knights	Environmental Instructor
Saul Lindauer	Environmental Instructor
Berine McAlice	Marine Biologist
Gale McCullough	Seal Researcher
Maury Mills	Refuge Manager
Tin Smith	Marine Biologist
Barbara Stasio	Teacher
Leslie Van Cott	Education Director, Maine Audubon
Alan Young	Research Biologist

APPENDIX 12

RESEARCH PROPOSAL:
INFORMATION REQUIREMENT

Research Proposals: Information Requirements

All researchers interested in performing research in the Wells National stuarine Sanctuary will provide the following information to the Sanctuary Manager.

1. General Information

   a) Title of Project
   b) Name of principal investigator and agency/organization affiliation
   c) Names of persons performing research
   d) Funding agency, address and contact person in agency
   e) Duration of project

2. Project Data

   a) Research project objectives and relationship to Sanctuary objectives
   b) Project methods, materials and equipment
   c) On-site storage requirements and/or laboratory needs
   d) Special access requirements (eg. 4-wheel drive, boat etc.)
   e) Visual impact of the project on the surrounding area
   f) Project impact on soils, bedrock, hydrological processes
   g) Addition of chemicals or radioactive materials to the environment.

Using a suitable map, indicate the areas within the Sanctuary to be used for the investigation. Give dimensions of study plot(s) in a sketch. If specific sites are not yet determined, please provide a description of the types of areas you will investigate. A map of specific sites must be submitted to the Sanctuary Manager prior to undertaking the proposed research.

APPENDIX 13

SAMPLE RESEARCH PERMIT

SAMPLE RESEARCH PERMIT

Richard Wallingford
University of Arkansas
Botany Department
Nowhere, Arkansas

Dear Richard,

On May 12, 1984 the Wells National Estuarine Sanctuary completed its review of your proposal entitled Estuarine Plant Response to Sea Level Rise. We have approved your proposal, based on the findings described below, provided you adhere to the conditions stated in this letter.

Findings

1. The proposed research actvities further the goals of the Wells National Estuarine Sanctuary (WNES) - to better understand the dynamics of the estuarine area.

2. This proposal will be performed in the wetland/transitional area of the Sanctuary encompassing the Wildlife Refuge and the Town of Wells property. Each party is agreeable to the proposal.

3. The proposal is compatible with the wetland management objectives described in the Sanctuary Management Plan. In particular, the objectives encourage the use of these areas as natural field laboratories for research purposes.

4. The request to use the Sanctuary laboratory on Monday's, Wednesday's, and Friday's between 8:00 A.M. and 5:00 P.M. is consistent with the research objectives of the Sanctuary.

Conditions

1. You will perform the research project as described in the attached research proposal form and supplemental materials you submitted to the WNES. Any deviations must be reported to the Sanctuary Manager and approved before the activity may commence.

2. Research activities must conform to all local, State and federal laws.

3. The WNES is not responsible for any research projects that are adversely affected by natural or man-made events.

4. The WNES may terminate the research project, with seven days notice, if it determines the research activity is harmful to Sanctuary resources.

Please consider this letter as your permit, provided you agree to the stated conditions. Should you have any questions, please let me know.

Sincerely,

Sanctuary Manager

Wells National Estuarine Sanctuary

Use Permit

Date: _____

Permittee: _____

Address: _____

Affiliation: _____

Period of Use: From _____ To _____

Purpose/Objective: _____

_____

_____

Description of Use: _____

_____

_____

Special Conditions: _____

_____

_____

This permit, and all attachments, is issued by the Wells Estuarine Sanctuary and is accepted by the permittee.

Permitee: _____ Date: _____

State Park Manager _____ Date: _____

Refuge Manager _____ Date: _____

Sanctuary Manager _____ Date: _____

APPENDIX 14

NATIONAL ESTUARINE SANCTUARY
PROGRAM REGULATIONS

federal register

Wednesday
June 27, 1984

Part IV

Department of Commerce

National Oceanic and Atmospheric Administration

15 CFR Part 921

National Estuarine Sanctuary Program Regulations; Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 921

[Docket No. 40315-30]

National Estuarine Sanctuary Program Regulations

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

ACTION: Final rule.

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

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

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

SUPPLEMENTARY INFORMATION:

I. Authority

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

II. General Background

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

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

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

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

A. Defining the Mission and Goals of the Program

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

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

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

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

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

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

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

(2) Site Designation

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

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

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

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

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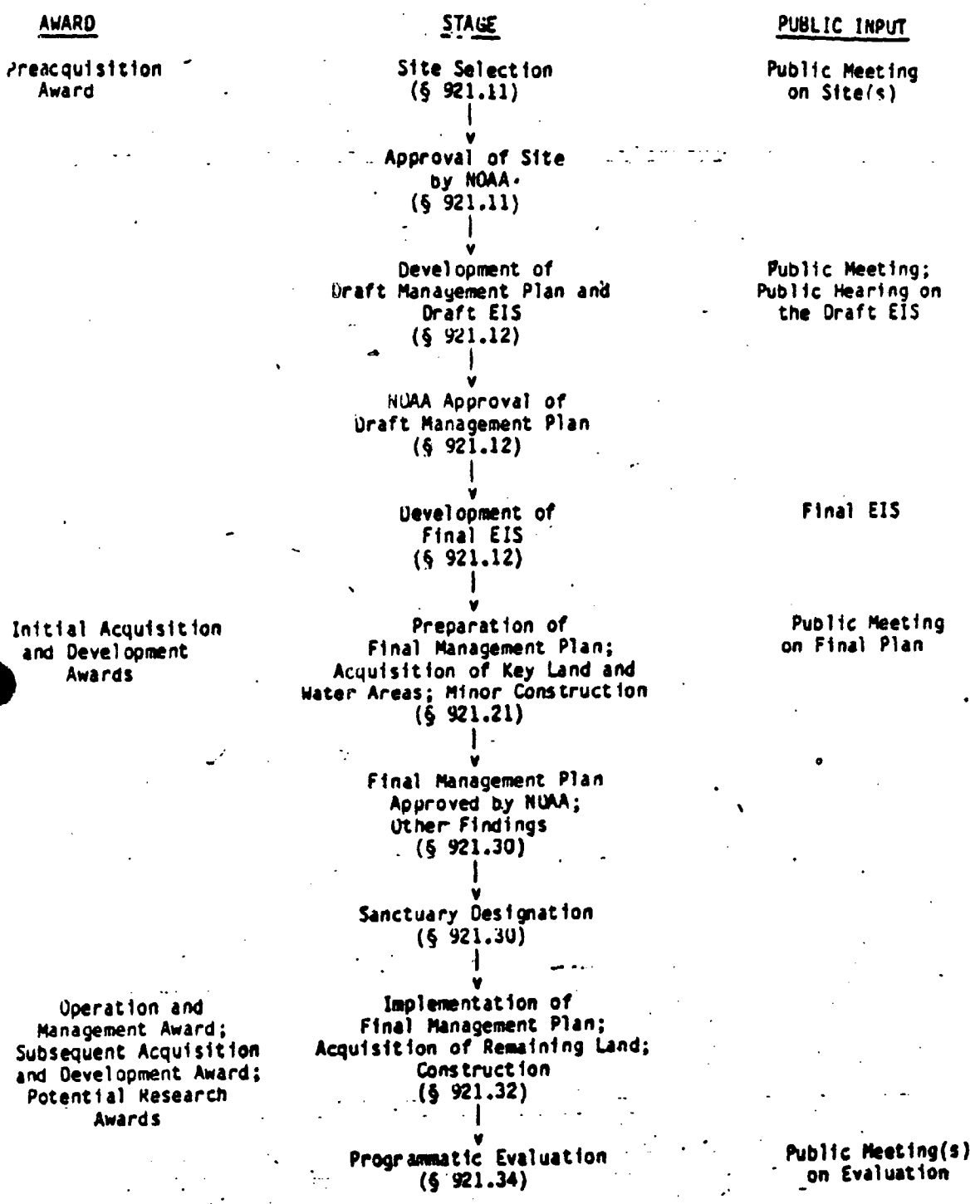
Figure 1. National Estuarine Sanctuary Program Designation Process



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

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

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

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

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

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

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

General

Impact on Existing Sanctuaries

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

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

Public Participation

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

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

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

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

Section-by-Section Analysis

Subpart A—General

Section 921.1—Mission and Goals.

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

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

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

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

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

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

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

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

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

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

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

(4) Several commenters strongly supported the concept in § 921.1(d) of encouraging multiple use of estuarine sanctuaries. One of the same commenters also supported the statement in Section 921.11(c)(3) that the site selection process consider "the site's compatibility with existing and potential land and water use in contiguous areas."

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

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

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

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

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

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

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

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

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

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

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

Subpart B—Preacquisition: Site Selection and Management Plan Development

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

selection and continues through all the development stages. NOAA may support up to one-half of the total costs of establishing a particular sanctuary.

NOAA's programmatic commitment to a proposed sanctuary begins with approval of a site and continues through the management plan review and preparation of the EIS. If the sanctuary proposal is approved, and if the requirements of the preacquisition phase are met, NOAA will proceed with establishing the site as a national estuarine sanctuary.

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

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

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

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

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

Subpart C—Development and Preparation of the Final Management Plan

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(5) One state questioned who would decide the "current fair market value" of lands slated for withdrawal of designation in § 921.35(e)(1) [now § 921.21(e)(1)]. It was recommended that an arbitration system of three independent appraisers or comparable system be established.

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

Subpart E—Research Funds

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

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

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

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

Subpart F—General Financial Assistance Provisions

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

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

Appendix 2—Estuarine Typology

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

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

From Vallentyne, I. 1963. Uber die Biologie der Ostsee als Brackwassergebiet. Verh. Int. Verein. theor. angew. Limnol. 61.

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

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

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

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

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

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

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

V. Other Actions Associated With the Proposed Rulemaking

(A) Classification Under Executive Order 12291

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

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

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

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

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

(B) Regulatory Flexibility Act Analysis

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

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

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

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

These regulations do not impose any information requirements of the type covered by Pub. L. 96-511 other than those already approved by the Office of Management and Budget (approval number 0648-0121) for use through September 30, 1986.

(D) National Environmental Policy Act

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

List of Subjects in 15 CFR Part 921

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

(Federal Domestic Assistance Catalog Number 11.420 Estuarine Sanctuary Program)

Dated: February 29, 1984.

Paul M. Wolff,

Assistant Administrator for Ocean Services and Coastal Zone Management.

Accordingly, 15 CFR Part 921 is revised as follows:

PART 921—NATIONAL ESTUARINE SANCTUARY PROGRAM REGULATIONS

Subpart A—General

Authority: Sec. 313(l), Pub. L. 92-583, as amended; 86 Stat. 1280 (16 U.S.C. 1461(1)).

Subpart A—General

§ 921.1 Mission and goals.

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 921.2 Definitions.

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

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

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

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

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

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

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

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

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

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

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

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

Subpart B—Preacquisition: Site Selection and Management Plan Development

§ 921.10 General.

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

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

§ 921.11 Site selection.

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

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

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

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

(3) A description of how public participation will be incorporated into the process (see § 921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

(1) The site's benefit to the National Estuarine Sanctuary Program relative to the biogeographic classification scheme

nd typolog set forth in § 921.3 and ppendices 1 and 2.

(2) The site's ecological ...racteristics, including its biological ...ductivity, diversity of flora and ...una, and capacity to attract a broad ...ange of research and educational interests. The proposed site should, to the maximum extent possible, be a natural system;

(3) Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. National estuarine sanctuaries may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced, see § 921.51(e)(2). Importantly, however, NOAA will not approve a site for potential sanctuary status that is dependent upon the inclusion of currently protected Federal lands in order to meet the requirements for sanctuary status (such as key land and water areas). Such lands may only be included within a sanctuary to serve as a buffer or for other ancillary purposes;

(4) The site's importance for research, including proximity to existing research ...ilities and educational institutions; ...mment: NOAA is developing more ...ailed criteria for selecting potential ...ational estuarine sanctuaries based upon research characteristics. Once these criteria are developed, a notice of their availability will be published in the Federal Register).

(5) The site's compatibility with existing and potential land and water uses in contiguous areas; and

(6) The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process, the state must seek the views of affected landowners, local governments, other state and Federal agencies, and other parties who are interested in the area(s) being considered for selection as a potential national estuarine sanctuary. After the local government and affected landowners have been contacted, at least one public meeting shall be held in the area of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal news media at least 15 days prior to the date of the meeting and ...NOAA in the Federal Register.

§ 921.12 Management Plan development.

(a) After the selected site is approved by NOAA and the state, the state may request the remainder of the preacquisition funds to develop the draft management plan and environmental impact statement. The request must be accompanied by the information specified in Subpart F and the following programmatic information:

(1) An analysis of the site based on the biogeographic scheme/typology discussed in § 921.3 and set forth in Appendices 1 and 2;

(2) A description of the site and its major resources, including location, proposed boundaries, and adjacent land uses. Maps, including aerial photographs, are required;

(3) A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted;

(4) A list of all sites considered and a brief statement of the basis for not selecting the non-preferred sites; and

(5) A draft management plan outline (see subsection (b) below) and an outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state roles in sanctuary management during the period of federal funding and expressing the state's long-term commitment to operate and manage the sancturay.

(b) After NOAA approves the state's request to use the remaining preacquisition funds, the state shall begin developing a draft management plan. The plan will set out in detail:

(1) Sanctuary goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;

(2) An administrative section including staff roles in administration, research, education/interpretation, and surveillance and enforcement.

(3) A research plan, including a monitoring design;

(4) An interpretive plan (including interpretive, educational and recreational activities);

(5) A plan for public access to the sanctuary;

(6) A construction plan, including a proposed construction schedule, and drawings of proposed developments. If a visitor center, research center or any other facilities are proposed for construction or renovation at the site, a preliminary engineering report must be prepared;

Note.—Information on preparing a preliminary engineering report (PER) is provided in "Engineering and Construction Guidelines for Coastal Energy Impact Program Applicants" (42 FR 64830 (1977)), which is supplied to award recipients.

(7) An acquisition plan identifying the ecologically key land and water areas of the sanctuary, priority acquisitions, and strategies for acquiring these areas. This plan should identify ownership patterns within the proposed sanctuary boundaries; land already in the public domain; an estimate of the fair market value of land to be acquired; the method of acquisition, or the feasible alternatives (including less-than-fee techniques) for the protection of the estuarine area; a schedule for acquisition with an estimate of the time required to complete the proposed sanctuary; and a discussion of any anticipated problems;

Note.—As discussed in § 921.11(c)(3), if protected lands are to be included within the proposed sanctuary, the state must demonstrate to NOAA that the site meets the criteria for national estuarine sanctuary status independent of the inclusion of such protected lands.

(8) A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the sanctuary, and a strategy for sanctuary surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;

(9) If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions; and

(10) A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the national estuarine sanctuary, and expressing the long-term commitment by the state to maintain effectively the sanctuary after Federal financial assistance ends. In conjunction with the MOU and where possible under state law, the state will consider taking appropriate administrative or legislative action to ensure the long-term protection of the sanctuary. The MOU shall be signed prior to sanctuary designation. If other MOUs are necessary (such as with a federal agency or another state agency), drafts of such MOUs also must be included in the plan.

(c) Regarding the preparation of an environmental impact statement (EIS) under the National Environmental Polic Act on a national estuarine sanctuary proposal, the state shall provide all

necessary information to NOAA concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, NOAA will prepare the draft EIS.

(d) Early in the development of the draft management plan and the draft EIS, the state shall hold a meeting in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the Federal Register and in local media.

(e) NOAA will publish a Federal Register notice of intent to prepare a DEIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the DEIS will appear in the Federal Register. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed sanctuary. The hearing will be held no sooner than 15 days after appropriate notice by NOAA of the meeting has been given in the principal news media and in the Federal Register. After a 45-day comment period, a final EIS is prepared by NOAA.

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

§ 921.20 General.

After NOAA approval of the site, the draft management plan and the draft MOU, and completion of the final EIS, a state is eligible for an acquisition and development award to acquire land and water areas for inclusion in the sanctuary and to construct research and educational facilities in accordance with the draft management plan. The acquisition and development award has two phases. In the initial phase, state performance should work to meet the criteria required for formal sanctuary designation, i.e., acquiring the key land and water areas as specified in the draft management plan and preparing the final plan. These requirements are specified in § 921.30. The initial acquisition and development phase is expected to last no longer than two years after the start of the award. If necessary, a longer time period may be negotiated between the state and NOAA. After the sanctuary is designated, funds may be used to acquire any remaining land and for construction purposes.

§ 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient in: (1) Acquiring land and water areas to be included in the sanctuary boundaries; (2) minor construction, as provided in paragraphs (b) and (c) of this section; (3) preparing the final management plan; and (4) up to the point of sanctuary designation, for initial management costs, e.g., implementing the NOAA approved draft management plan, preparing the final management plan, hiring a sanctuary manager and other staff as necessary, and for other management-related activities. Application procedures are specified in Subpart F.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted under the initial acquisition and development award. No more than five (5) percent of the initial acquisition and development award may be expended on such facilities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

(d) Except as specifically provided in paragraphs (a)–(c) of this section, construction projects, to be funded in whole or in part under the acquisition and development award, may not be initiated until the sanctuary receives formal designation, see § 921.30.

Note.—The intent of these requirements and the phasing of the acquisition and development award is to ensure that substantial progress in acquiring the key land and waters areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) Deeds for real property acquired for the sanctuary under acquisition funding shall contain substantially the following provision:

Title to the property conveyed by this deed shall vest in the [recipient of the CZMA Section 315 award or other Federally-approved entity] subject to the condition that the property shall remain part of the Federally-designated [name of National Estuarine Sanctuary]. In the event that the property is no longer included as part of the sanctuary, or if the sanctuary designation of which it is part is withdrawn, then the National Oceanic and Atmospheric Administration or its successor agency, in conjunction with the State, may exercise any of the following rights regarding the disposition of the property:

(i) The recipient may be required to transfer title to the Federal Government. In such cases, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the program or project to the current fair market value of the property; or

(ii) At the discretion of the Federal Government, (a) the recipient may either be directed to sell the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (minus actual and reasonable selling and fix-up expenses, if any, from the sale proceeds); or (b) the recipient may be permitted to retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property.

Note.—Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by OMB Circular A-102 Revised, Attachment P.

(f) Prior to submitting the final management plan to NOAA for review and approval, the state should hold a public meeting in the area affected by the estuarine sanctuary. NOAA will publish a notice of the meeting in the Federal Register and in the local media.

Subpart D—Sanctuary Designation and Subsequent Operation

§ 921.30 Designation of National Estuarine Sanctuaries.

(a) The AA shall designate an area as a national estuarine sanctuary pursuant to Section 315 of the Act, based upon written findings that the state has met the following conditions:

(1) A final management plan has been approved by NOAA;

(2) Sanctuary construction and access policies, § 921.21(b)–(d), have been followed;

(3) Key land and water areas of the proposed sanctuary, as identified in the management plan, are under state control; and

(4) An MOU between the state and NOAA ensuring a long-term commitment by the state to the

sanctuary's effective operation and implementation has been signed.

(b) A notice of designation of a ional estuarine sanctuary will be ced in the Federal Register and in the cal media.

(c) The term "state control" in § 921.30(a)(3) does not necessarily require that the land be owned by the state in fee simple. Less-than-fee interests and regulatory measures may suffice where the state makes a showing that the lands are adequately controlled consistent with the purposes of the sanctuary.

§ 921.31 Supplemental acquisition and development awards.

After sanctuary designation, and as specified in the approved management plan, the state may request a supplemental acquisition and development award for construction and acquiring any remaining land. Application procedures are specified in Subpart F. Land acquisition must follow the procedures specified in § 921.21(e).

§ 921.32 Operation and management: Implementation of the Management plan.

(a) After the sanctuary is formally designated, the state may apply for assistance to provide for operation and management. The purpose of this phase in the national estuarine sanctuary process is to implement the approved l management plan and to take the cessary steps to ensure the continued ective operation of the sanctuary ter direct Federal support is concluded.

(b) Federal funds of up to $250,000, to be matched by the state, are available for the operation and management of the national estuarine sanctuary. Operation and management awards are subject to the following limitations:

(1) No more than $50,000 in Federal funds per annual award; and

(2) No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities (i.e., $10,000 maximum per year).

§ 921.33 Boundary changes, amendments to the Management Plan, and addition of multiple-site components.

(a) Changes in sanctuary boundaries and major changes to the final management plan, including state laws or regulations promulgated specifically for the sanctuary, may be made only after written approval by NOAA. If determined to be necessary, NOAA may require public notice including notice in the Federal Register and an opportunity r comment. Changes in the boundary olving the acquisition of properties not lis d in the management plan or final EIS require public notice and the opportunity for comment; in certain cases, an environmental assessment may be required. Where public notice is required, NOAA will place a notice in the Federal Register of any proposed changes in sanctuary boundaries or proposed major changes to the final management plan and ensure that a notice is published in the local media.

(b) As discussed in § 921.10(b), a state may choose to develop a multiple-site national estuarine sanctuary after the initial acquisition and development award for a single site has been made. Public notice of the proposed addition in the Federal Register and local media, and the opportunity for comment, in addition to the preparation of either an environmental assessment or environment impact statement on the proposal will be required. An environmental impact statement, if required, will be prepared in accordance with section 921.12 and will also include an administrative framework for the multiple-site sanctuary that describes the complementary research and educational programs within the sanctuary. If NOAA determines, based on the scope of the project and the issues associated with the additional site, that an environmental assessment is sufficient to establish a mulitple-site sanctuary, then the state shall develop a revised management plan as described in § 921.12(b). The revised management plan will address the sanctuary-wide goals and objectives and the additional component's relationship to the original site.

§ 921.34 Program evaluation.

(a) Performance during the term of the operation and management award (or under the initial acquisition and development award, if the sanctuary is not designated within two years) will be evaluated annually by the Program Office and periodically in accordance with the provisions of Section 312 of the Act to determine compliance with the conditions of the award and overall progress in implementing the management plan.

(b) To ensure effective sanctuary oversight after the major federal funding expires, the state is required to submit an annual report on the sanctuary. The report should detail program successes and accomplishments in meeting the policies and activities described in the sanctuary management plan. A work plan, detailing the projects to be undertaken the next year to meet the Program goals and the state's role in ongoing sanctuary programs, should also be included. Inadequate annual reports will trigger a full-scale management audit with a site-visit. On a periodic basis, NOAA will also conduct a full-scale Section 312 evaluation with a site visit and public meeting.

§ 921.35 Withdrawal of designation.

(a) Upon a finding by the Program Office through its programmatic evaluation (§ 921.34) that a national estuarine sanctuary is not meeting the mandate of Section 315 of the Act, the national Program goals or the policies established in the management plan, NOAA will provide the state with a written notice of the deficiency. Such a notice will explain the deficiencies in the state's approach, propose a solution or solutions to the deficiency and provide a schedule by which the state should remedy the deficiency. The state shall also be advised in writing that it may comment on the Program Office's finding of a deficiency and meet with Program officials to discuss the finding and seek to remedy the deficiency.

(b) If the issues cannot be resolved within a reasonable time, the Program Office will make recommendation regarding withdrawal of designation to the AA. A notice of intent to withdraw designation, with an opportunity for comment, will be placed in the Federal Register.

(c) The state shall be provided the opportunity for an informal hearing before the AA to consider the Program Office's recommendation and finding of deficiency, as well as the state's comments on and response to the recommendation and finding.

(d) Within 30 day after the informal hearing, the AA shall issue a written decision regarding the sanctuary. If a decision is made to withdraw sanctuary designation, the procedures specified in § 921.21(e) regarding the disposition of real property acquired with federal funds shall be followed.

Subpart E—Research Funds

§ 921.40 General.

(a) To stimulate high quality research within designated national estuarine sanctuaries, NOAA may find research on a competitive basis to sanctuaries having an approval final management plan. Research funds are intended to support significant research projects that will lead to enhanced scientific understanding of the sanctuary environment, improved coastal decisionmaking, improved sanctuary management, or enhanced public appreciation and understanding of the sanctuary ecosystem. Research opportunities will be identified in final

management plans for national estuarine sanctuaries. Research funds will be used to fill obvious voids in available data, as well as to support creative or innovative projects.

(b) Research funds are provided in addition to any funds available to the state under the operation and management or acquisition and development awards. Research funds must be matched by the state, consistent with § 921.51(e)(iii) ("allowable costs"). Individual states may apply for funding for more than one research project per sanctuary.

§ 921.41 Categories of potential research project; evaluation criteria.

(a) While research funds may be used to start-up long-term projects, they are not intended as a source of continuing funding for a particular project over time. Emphasis will be placed on projects that are also of benefit to other sanctuaries in the system. Proposals for research under the following categories will be considered:

(1) Establishing a Data Base and Monitoring Program (e.g., studies related to gathering and interpreting baseline information on the estuary. Funds are available to establish a data base and monitoring system; however, the long-term support for such a system must be carried out as part of overall sanctuary implementation);

(2) Estuarine Ecology (e.g., studies of the relationships between estuarine species and their environment, studies of biological populations community relationships, studies on factors and processes that govern the biological productivity of the estuary);

(3) Estuarine Processes (e.g., studies on dynamic physical processes that influence and give the estuary its particular physical characteristics, including studies related to climate, patterns of watershed drainage and freshwater inflow, patterns of water circulation within the estuary, and studies on oceanic or terrestrial factors that influence the condition of estuarine waters and bottoms);

(4) Applied Research (e.g., studies designed to answer specific management questions); and

(5) Socioeconomic Research (e.g., studies on patterns of land use, sanctuary visitation, archaeological research).

(b) Proposals for research in national estuarine sanctuaries will be evaluated in accordance with criteria listed below:

(1) Scientific merits;

(2) Relevance or importance to sanctuary management or coastal decisionmaking;

(3) Research quality (i.e., soundness of approach, environmental consequences, experience related to methodologies);

(4) Importance to the National Estuarine Sanctuary Program;

(5) Budget and Institutional Capabilities (i.e., reasonableness of budget, sufficiency of logistical support); and

(6) In addition, in the case of long-term monitoring projects, the ability of the state or the research grant recipient to support the grant beyond this initial funding.

Subpart F—General Financial Assistance Provisions

§ 921.50 Application information.

(a) The maximum total Federal funding per sanctuary is $3,000,000 for the preacquisition, acquisition and development, and operation and management awards. The research funding under § 921.40 is excluded from this total.

(b) Only a state Governor, or his/her designated state agency, may apply for national estuarine sanctuary financial assistance awards. If a state is participating in the national Coastal Zone Management Progam, the recipient of an award under Section 315 of the Act shall consult with the state coastal management agency regarding the application.

(c) No acquisition and development award may be made by NOAA without the approval of the Governor of the state, or his/her designated agency, in which the land to be acquired is located.

(d) All applications are to be submitted to: Management and Budget Group, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 3300 Whitehaven St., NW., Washington, D.C. 20235.

(e) An original and two copies of the complete application must be submitted at least 120 working days prior to the proposed beginning of the project. The Application for Federal Assistance Standard Form 424 (Non-construction Program) constitutes the formal application for preacquisition, operation and management, and research awards. The Application for Federal Assistance Standard Form 424 (Construction Program) constitutes the formal application for land acquisition and development awards. The application must be accompanied by the information required in Subpart B (preacquisition), Subpart C and Section 921.31 (acquisition and development), and § 921.32 (operation and management), as applicable. All applications must contain back up data for budget estimates (Federal and non-Federal shares), and evidence that the application complies with the Executive Order 12372, "Intergovernmental Review of Federal Programs." In addition, applications for acquisition and development awards must contain:

(1) State Historic Preservation Office comments;

(2) Appraisals and title information;

(3) Governor's letter approving the sanctuary proposal; and

(4) Written approval from NOAA of the draft or final management plan.

The Standard Form 424 has been approved by the Office of Management and Budget (Approval number 0648-0121) for use through September 30, 1988.

§ 921.51 Allowable costs.

(a) Allowable costs will be determined in accordance with OMB Circulars A-102, "Uniform Administrative Requirements for Grants-in-Aid to State and Local Governments", and A-87, "Principles for Determining Costs Applicable to Grants and Contracts with State, Local, and Federally Recognized Indian Tribal Governments"; the financial assistance agreement; these regulations; and other Department of Commerce and NOAA directives. The term "costs" applies to both the Federal and non-Federal shares.

(b) Costs claimed as charges to the award must be reasonable, beneficial and necessary for the proper and efficient administration of the financial assistance award and must be incurred during the awards period, except as provided under preagreement costs, subsection (d).

(c) Costs must not be allocable to or included as a cost of any other Federally-financed program in either the current or a prior award period.

(d) Costs incurred prior to the effective date of the award (preagreement costs) are allowable only when specifically approved in the financial assistance agreement. For non-construction awards, costs incurred more than three months before the award beginning date will not be approved. For construction and land acquisition awards, NOAA will evaluate preagreement costs on a case-by-case basis.

(e) General guidelines for the non-Federal share are contained in OMB Circular A-102, Attachment F. The following may be used by the state in satisfying the matching requirement:

(1) *Preacquisition Awards.* Cash and in-kind contributions (value of goods

and services directly benefiting and specifically identifiable to this part of the project) are allowable. Land may not be used as match.

(2) *Acquisition and Development Awards.* Cash and in-kind contributions are allowable. In general, the fair market value of lands to be included within the sanctuary boundaries and acquired pursuant to the Act, with other than Federal funds, may be used as match. The fair market value of privately donated land, at the time of donation, as established by an independent appraiser and certified by a responsible official of the State (pursuant to OMB Circular A-102 Revised, Attachment F) may also be used as match. Appraisals must be performed according to Federal appraisal standards as detailed in NOAA regulations and the "Uniform Appraisal Standards for Federal Land Acquisitions." Costs related to land acquisition, such as appraisals, legal fees and surveys, may also be used as match. Land, including submerged lands, already in the state's possession, in a fully-protected status consistent with the purposes of the National Estuarine Sanctuary Program, may be used as match only if it was acquired within a one-year period prior to the award of preacquisition or acquisition funds and with the intent to establish a national estuarine sanctuary. For state lands not in fully-protected status (e.g., a state park containing an easement for subsurface mineral rights), the value of the development right or foregone value may be used as match if acquired by or donated to the state for inclusion within the sanctuary.

A state may initially use as match land valued at greater than the Federal share of the acquisition and development award. The value in excess of the amount required as match for the initial award may be used to match subsequent supplemental acquisition and development awards for the estuarine sanctuary.

(3) *Operations and Management Awards; Research Funds.* Cash and in-kind contributions (directly benefiting and specifically identifiable to this phase of the project), except land, are allowable.

§ 921.52 Amendments to financial assistance awards.

Actions requiring an amendment to the financial assistance award, such as a request for additional Federal funds, revisions of the approved project budget, or extension of the performance period must be submitted to NOAA on Standard Form 424 (OMB approved number 0748-0121 for use through September 30, 1986) and approved in writing.

Appendix 1—Biographic Classification Scheme

Acadian

1. Northern Gulf of Maine (Eastport to the Sheepscot River).
2. Southern Gulf of Maine (Sheepscot River to Cape Cod).

Virginian

3. Southern New England (Cape Cod to Sandy Hook).
4. Middle Atlantic (Sandy Hook to Cape Hatteras).
5. Chesapeake Bay.

Carolinian

6. Northern Carolinas (Cape Hatteras to Santee River).
7. South Atlantic (Santee River to St. John's River).
8. East Florida (St. John's River to Cape Canaveral).

West Indian

9. Caribbean (Cape Canaveral to Ft. Jefferson and south).
10. West Florida (Ft. Jefferson to Cedar Key).

Louisianian

11. Panhandle Coast (Cedar Key to Mobile Bay).
12. Mississippi Delta (Mobile Bay to Galveston).
13. Western Gulf (Galveston to Mexican border).

Californian

14. Southern California (Mexican border to Point Concepcion).
15. Central California (Point Concepcion to Cape Mendocino).
16. San Francisco Bay.

Columbian

17. Middle Pacific (Cape Mendocino to the Columbia River).
18. Washington Coast (Columbia River to Vancouver Island).
19. Puget Sound.

Great Lakes

20. Western Lakes (Superior, Michigan, Huron).
21. Eastern Lakes (Ontario, Erie).

Fjord

22. Southern Alaska (Prince of Wales Island to Cook Inlet).
23. Aleutian Islands (Cook Inlet to Bristol Bay).

Sub-Arctic

24. Northern Alaska (Bristol Bay to Demarcation Point).

Insular

25. Hawaiian Islands.
26. Western Pacific Island.
27. Eastern Pacific Island.

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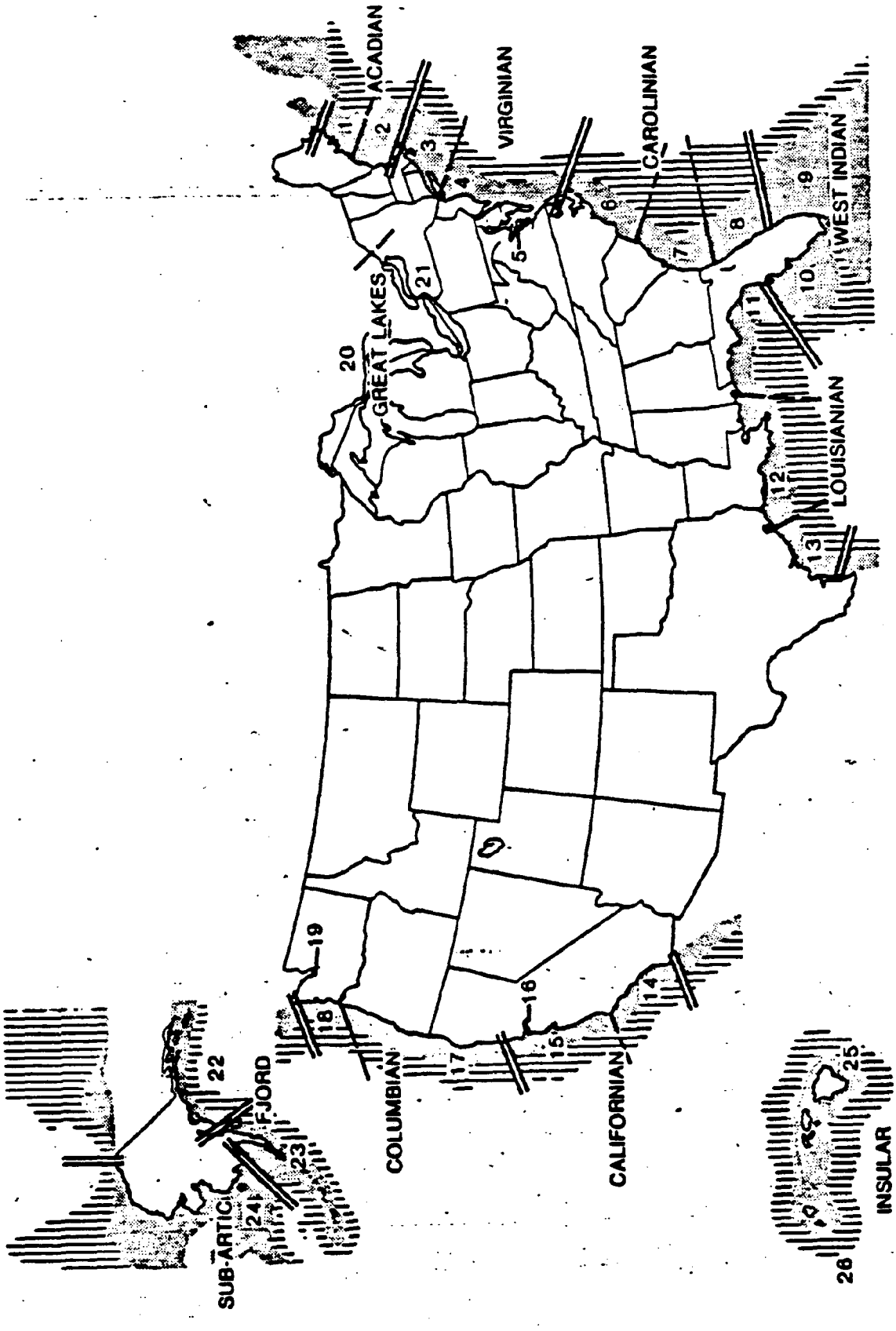

Figure 1. Biogeographic Regions of the United States.

Appendix 2—Typology of National Estuarine Areas

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine sanctuaries. Priority will be given to important ecosystem type as yet unrepresented in the sanctuary system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I—Ecosystem Types

Group I—Shorelands

A. *Maritime Forest-Woodland:* This type of ecosystem consists of single-stemmed species that have developed under the influence of salt spray. It can be found on coastal uplands or recent features, such as barrier islands and beaches, and may be divided into the following biomes:

1. *Northern Coniferous Forest Biome:* This is an area of predominantly evergreens such as the sitka spruce (*Picea*), grand fir (*Abies*), and white cedar (*Thuja*), with poor development of the shrub and herb layers, but high annual productivity and pronounced seasonal periodicity.

2. *Moist Temperate (Mesothermal) Coniferous Forest Biome:* Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has a relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.

Temperate Deciduous Forest Biome: This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern, well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distant subdivision of this biome is the *pine edaphic forest* of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. *Broad-leaved Evergreen Subtropical Forest Biomes:* The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South-Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarind, strangler fig, gumbo limbo, and palms.

B. *Coast Shrublands:* This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. *Northern Areas:* Characterized by *Hudsonia*, various ericaceous species, and thickets of *Myrica*, *Prunus*, and *Rosa*.

2. *Southeast Areas:* Floral dominants include *Myrica*, *Baccharis*, and *Ilex*.

3. *Western Areas: Adenostoma*, *Arctostaphylos*, and *Eucalyptus* are the dominant floral species.

C. *Coastal Grasslands:* This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (2 to 4 feet tall), such as *Ammophila*, *Agropyron*, and *Calamovilfa*, tall grasses (5 to 8 feet tall), such as *Spartina*, and trees such as the willow (*Salix* sp.), cherry (*Prunus* sp.), and cottonwood (*Populus deltoides*). This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: *Elymus;*
2. Northeast/West: *Ammophila;*
3. Southeast/Gulf: *Uniola;* and
4. Mid-Atlantic/Gulf: *Spartina patens.*

D. *Coastal Tundra:* This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as *Empetrum nigrum* and *Betula nana*, the lichens *Cetraria* and *Cladonia*, and herbaceous plants such as *Potentilla tridentata* and *Rubus chamaemorus*. Common species on the coastal beach ridges of the high arctic desert include *Dryas integrifolia* and *Saxifrage oppositifolia*.

This area can be divided into two main subdivisions:

1. *Low Tundra:* characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. *High Tundra:* a bare area except for a scanty growth of lichens and grasses, with underlying ice wedges forming raised polygonal areas.

E. *Coastal Cliffs:* This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and "higher" plant representatives.

Group II—Transition Areas

A. *Coastal Marshes:* These are wetland areas dominated by grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), cattails (Typhaceae), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) tidal, which is periodically flooded by either salt or brackish water; (b) non-tidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serves important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. *Coastal Swamps:* These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. *Coastal Mangroves:* This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by variety of salt-tolerant trees, such as the red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia nitida*), and the white mangrove (*Laguncularia racemosa*). It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. *Intertidal Beaches:* This ecosystem has a distinct biota of microscopic animals, bacteria, and unicellular algae along with macroscopic crustaceans, molluska, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (*Emerita*), amphipods (Gammaridae), ghost crabs (*Ocypode*), and bivalve molluscs such as the coquina (*Donax*) and surf clams (*Spisula* and *Mactra*)

E. *Intertidal Mud and Sand Flats:* These areas are composed of unconsolidated, high organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dinoflagellates, filamentous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell *Donax*, the scallop *Pecten*, tellin shells *Tellina*, the heart urchin *Echinocardium*, the lug worm *Arenicola*, sand dollar *Dendraster*, and the sea pansy *Renilla*. In mud, faunal dominants adapted to low oxygen levels include the terebellid *Amphitrite*, the boring clam *Playdon*, the deep sea scallop *Placopecten*, the quahog *Mercenaria*, the echiurid worm *Urechis*, the mud snail *Nassarius*, and the sea cucumber *Thyone*.

F. *Intertidal Algal Beds:* These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. *Northern Latitude Rocky Shores:* It is in this region that the community structure is best developed. The dominant algal species include *Chondrus* at the low tide level, *Fucus* and *Ascophyllum* at the mid-tidal level, and *Laminaria* and other kelp-like algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.

2. *Southern Latitudes:* The communities in this region are reduced in comparison to

those of the northern latitudes and possesses algae consisting mostly of single-celled or filamentous green, blue-green, and red algae, and small thalloid brown algae.

3. *Tropical and Subtropical Latitudes:* The intertidal in this region is very reduced and contains numerous calcareous algae such as *Porolithon* and *Lithothamnion*, as well as green algae with calcareous particles such as *Halimeda*, and numerous other green, red, and brown algae.

Group III—Submerged Bottoms

A. *Subtidal Hardbottoms:* This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as kelp, may also be found.

B. *Subtidal Softbottoms:* Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. *Subtidal Plants:* This system is found in relatively shallow water (less than 6 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions, manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass *Zostera marina* predominates. In the South Atlantic and Gulf coast areas, *Thalassia* and *Diplanthera* predominate. The grasses in both areas support a number of epiphytic organisms.

Class II—Physical Characteristics

Group I—Geologic

A. *Basin Type:* Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. *Exposed Coast:* Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area, making them chief stabilizers of the ocean shorefront.

2. *Sheltered Coast:* Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters—abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects of pollution being more severe in this area than in exposed coastal areas.

3. *Bay:* Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced, the flushing action is augmented by river discharge. Bays vary in size and in type of shorefront.

4. *Embayment:* A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.

5. *Tidal River:* The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.

6. *Lagoon:* Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.

7. *Perched Coastal Wetlands:* Unique to Pacific islands, this wetland type, found above sea level in volcanic crater remnants, forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. Example: Aunu'u Island, American Samoa.

8. *Anchialine Systems:* These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs, have only a subsurface connection to the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthic algae such as *Rhizoclonium*, the mineral encrusting *Schizothrix*, and the vascular plant *Ruppia maritima*. Characteristic fauna, which exhibit a high degree of endemicity, include the mollusks *Theodoxus neglectus* and *T. cariosus*, the small red shrimp *Metabetaeus lohena* and *Halocaridina rubra*, and the fish *Eleotris sandwicensis* and *Kuhlia sandvicensis*. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. *Basin Structure:* Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. *Coastal plains estuary:* Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular, forming a simple coastal plains estuary. When a channel is flooded with numerous tributaries, an irregular estuary results. Many estuaries of the eastern United States are of this type.

2. *Fjord:* Estuaries that form in elongated, steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume, river discharge is small. But many fjords have restricted tidal ranges at their mouths, due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800 m to 1200 m, while sill depths usually range from 40 m to 150 m.

3. *Bar-bounded Estuary:* These result from the development of an offshore barrier, such as a beach strand, a line of barrier islands, reef formations, a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars or barrier islands, broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent sea level rises.

4. *Tectonic Estuary:* These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding, or movement of the earth's bedrock, often with a large inflow of freshwater.

5. *Volcanic Estuary:* These coastal bodies of open water, a result of volcanic processes, are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic origin.

C. *Inlet Type:* Inlets in various forms are an integral part of the estuarine environment, as they regulate, to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea. There are four major types of inlets:

1. *Unrestricted:* An estuary with a wide, unrestricted inlet typically has slow currents, no significant turbulence, and receive the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.

2. *Restricted:* Restrictions of estuaries can exist in many forms: bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a

tide-dominated, or storm. Such currents exert profound effects on the nature of the substrate, turbidity, and biota of the estuary.

3. *Permanent:* Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea. Sedimentation and deposition are minimal.

4. *Temporary (Intermittent):* Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea and sound waters, the frequency of storms, and the amount of littoral transport.

D. *Bottom Composition:* The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. *Sand:* Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shores and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a graduation toward finer particles in the head of the estuary. In the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.

2. *Mud:* At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silt, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.

3. *Rock:* Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. *Oyster shell:* Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

Group II—Hydrographic

A. *Circulation:* Circulation patterns are the result of the combined influences of freshwater flow, tidal action, wind and oceanic forces, and serve many functions: nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. *Stratified:* This is typical of estuaries with a strong freshwater influx and is commonly found in bays formed from "drowned" river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.

2. *Non-stratified:* Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.

3. *Lagoonal:* An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater influx and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation, whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. *Tides:* This is the most important ecological factor in an estuary, as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of their cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as *datum*. The tides, although complex, falls into three main categories:

1. *Diurnal:* This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.

2. *Semidiurnal:* This refers to a twice daily rise and fall in water that can be observed along the shoreline.

3. *Wind/Storm Tides:* This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. *Freshwater:* According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the land either from a surface and/or subsurface source.

1. *Surface water:* This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.

2. *Subsurface water:* This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water:

a. *Vadose water:* This is water in the soil above the water table. Its volume with respect to the soil, is subject to considerable fluctuation.

b. *Groundwater:* This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land, being high below hills and sloping into valleys.

Group III—Chemical

A. *Salinity:* This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand—ppt).

1. *Positive estuary:* This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.

2. *Negative estuary:* This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.

3. *Salinity zones (expressed in ppt):*

a. *Hyperhaline*—greater than 40 ppt.

b. *Euhaline*—40 ppt to 30 ppt.

c. *Mixohaline:* 30 ppt to 0.5 ppt.

(1) Mixoeuhaline—greater than 30 ppt but less than the adjacent euhaline sea.

(2) Polyhaline—30 ppt to 18 ppt.

(3) Mesohaline—18 ppt to 5 ppt.

(4) Oligohaline—5 ppt to 0.5 ppt.

d. *Limnetic:* Less than 0.5 ppt.

B. *pH Regime:* This is indicative of the mineral richness of estuarine waters and fall into three main categories:

1. *Acid:* Waters with a pH of less than 5.5.

2. *Circumneutral:* A condition where the pH ranges from 5.5 to 7.4.

3. *Alkaline:* Waters with a pH greater than 7.4.

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APPENDIX 15

WELLS SANCTUARY MANAGER:

JOB DESCRIPTION

ESTUARINE SANCTUARY MANAGER

Salary: $ 21,000 - $25,000

Location: Wells National Estuarine Sanctuary, Wells, Maine

Description: Professional conservation work in planning, directing, and managing all aspects of a national estuarine sanctuary. Employee is responsible for directing administrative services including budgets, personnel, and purchasing; coordinating scientific research being performed; developing educational and concept plans; and developing and/or overseeing educational and media programs. Supervision is exercised over Sanctuary staff and volunteers.

Representative Tasks:

- Develops and writes work program and annual budget for the Sanctuary.
- Develops and writes annual reports that document and discuss major activities, issues, and management opportunities.
- Selects, trains and evaluates Sanctuary volunteers, docents, and staff.
- Enforces Sanctuary regulations.
- Prepares and/or supervises preparation of educational and interpretive concept plans, publications, exhibits, and demonstration areas.
- Coordinates scientific investigations that advance the objectives of the Sanctuary.
- Assists in preparation of financial applications to funding agencies and organizations.

Required Knowledge and Abilities:

- Knowledge of natural area management and administration.
- Knowledge of biology, botany, zoology, plant and animal ecology, and marine biology.
- Knowledge of interpretive and educational methods and techniques.
- Knowledge of outdoor recreation planning.
- Ability to determine prospective audiences for Sanctuary programs.
- Ability to communicate effectively in the spoken and written word.
- Skill in operating small motorized watercraft, power tools and equipment.

Minimum Qualifications:

A BS/BA degree in natural science;

Two years of experience in the management of a natural area that has involved education and research activities;

(An advanced degree in business administration, natural area management or a related field is desirable.)

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