Final Evaluation Findings

Narragansett Bay National Estuarine Research Reserve

September 1999 – August 2004





Office of Ocean and Coastal Resource Management
National Ocean Service
National Oceanic and Atmospheric Administration

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I. EXECUTIVE SUMMARY

A. OVERVIEW

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System (NERRS). Sections 312 and 315 of the CZMA require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews or evaluations of federally approved National Estuarine Research Reserves (NERR). The most recent evaluation of the Narragansett Bay National Estuarine Research Reserve (NBNERR) examined the operation and management of the reserve from September 1999 through August 2004. The Rhode Island Department of Environmental Management (DEM) administers NBNERR.

This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management with respect to NBNERR during the review period. The fundamental conclusion of this evaluation is that DEM is successfully implementing and enforcing its federally approved NERR. The recommendations made by this evaluation appear in boxes and follow the relevant section of findings. Two types of recommendations are possible: (1) Necessary Actions address programmatic requirements and *must* be implemented by the indicated date; and (2) Program Suggestions describe actions that NOAA believes DEM should take to improve the program but currently are not mandatory. Program Suggestions that are reiterated in consecutive evaluations due to continuing problems may be elevated to Necessary Actions. If no dates are indicated, DEM is expected to address the recommendations by the time of the next §312 evaluation. This document contains seven Program Suggestions and three Necessary Actions. NOAA will consider the findings made by this evaluation when making future financial award decisions regarding NBNERR.

B. SUMMARY OF ACCOMPLISHMENTS

The evaluation team documented a number of NBNERR's accomplishments during the review period. These include:

Issue Area	Accomplishment
Staff	During the review period, NBNERR expanded its staff with dedicated, enthusiastic individuals. Increased staff have enabled the reserve to expand and to enhance its research, education and stewardship programs. Staff also work in a well-integrated manner to achieve program goals.
Facilities	NBNERR worked cooperatively with partners such as the DEM Division of Planning and Development and the Audubon Society of Rhode Island to improve reserve facilities during the review period.

System-wide Monitoring Program	The Research and Monitoring Program has been a proactive and valued contributor to the Narragansett Bay collaborative monitoring effort. The System-wide Monitoring Program and the Centralized Data Management Office's technician training and data management protocols are serving as models for Rhode Island's "Bay Window" Program. The reserve should remain fully involved in the state's monitoring programs for the Bay.
Community Outreach	Recognizing a need in the local community, the Education and Outreach Program shifted its focus from K-12 education to outreach during the review period. The Education and Outreach Program established strong, mutually beneficial partnerships with several organizations and agencies to address K-12 education for the reserve and shifted its focus to outreach activities such as designing a new website, publishing a series of fact sheets and developing an educational poster.
Habitat Inventory	The Stewardship Program conducted a habitat inventory of the reserve and designed a specific habitat classification scheme that has allowed staff to enhance stewardship planning and resource management at NBNERR. Stewardship activities were well coordinated with the Research Coordinator to take full advantage of research and monitoring opportunities.

C. SUMMARY OF RECOMMENDATIONS

In addition to the accomplishments listed above, the evaluation team identified several areas where the program could be strengthened. Recommendations are in the forms of Program Suggestions and Necessary Actions. Areas for program improvement include:

#	PS/NA	Recommendation
1	PS	NOAA encourages DEM and NBNERR to develop a staffing plan that identifies: (1) the Reserve Manager as a single, full-time position; (2) staffing needs that may arise as the reserve's programs grow; (3) ways to provide consistent, long-term support for reserve staffing and operations; and (4) a competitive process for recruiting new staff.
2	PS	NOAA strongly urges NBNERR's Manager and core staff to regularly attend Reserve System-wide meetings. When possible, the Stewardship Coordinator and CTP Coordinator also should attend Reserve System-wide meetings as well.
3	PS	NOAA highly recommends that NBNERR re-establish its Advisory Committee as soon as possible. Committee membership should include community representatives.

4	NA	Within one month of receipt of final evaluation findings, NBNERR must submit a strategy and timeline for revising its management plan to NOAA. The strategy must describe a process for community involvement. Once the strategy and timeline are complete, NBNERR must provide updates on the management plan's revision process in its semi-annual performance reports. The plan must be completed no later than 18 months following receipt of the final evaluation findings, unless a modification to the deadline is approved by NOAA.
5	PS	NOAA strongly recommends that NBNERR and DEM conduct a study that thoroughly examines: (1) the capacity of the reserve's staff, facilities and programming to handle increased visitation; (2) the public health risk of increasing visitation in an area where people are at significant risk of contracting one or more debilitating tick-borne illnesses. Such a study should be a component of the impact analysis to be completed during the management plan revision.
6	NA	NBNERR must work towards resolution of the issues surrounding the timely completion of grant tasks as soon as possible. Upon receipt of final evaluation findings, NBNERR also must immediately begin submitting performance reports on time. Performance reports must cover the relevant reporting period only.
7	PS	The Research and Monitoring Program should work with the local and regional research community to explore options for increasing research at NBNERR. The Research and Monitoring Program should develop a plan to expand the reserve's research potential and productivity. The Research and Monitoring Program should establish a research advisory committee to assist with this action, provide input for the management plan, and provide ongoing support and advice.
8	NA	Within one month of receipt of final evaluation findings, the Research and Monitoring Program must submit a timeline for completing the site profile to NOAA. Once the timeline is developed, NBNERR must provide updates on the site profile's status in its semi-annual performance reports. The site profile must be completed within a year following the receipt of final evaluation findings.
9	PS	NOAA strongly encourages the Education and Outreach Program to identify new goals and to evaluate how each activity furthers those goals given the shift in program priorities from K-12 education to community outreach. The revised management plan should address the Education and Outreach Program's current goals and activities with regard to planned boundary expansions, improved reserve facilities and new opportunities that will be created as partners like Save the Bay expand their facilities and programs.

10	PS	NOAA strongly encourages the Stewardship Program and DEM to work collaboratively with the residents of Prudence Island to develop an effective deer management program that not only reduces the herd to an optimal size, but also addresses concerns held by residents. NOAA also encourages the Stewardship Program and DEM to renew efforts to enlist the assistance of the Rhode Island Department of Public Health in addressing the prevalence of tick-borne illnesses on Prudence Island.

II. PROGRAM REVIEW PROCEDURES

A. OVERVIEW

The National Oceanic and Atmospheric Administration (NOAA) began its review of the Narragansett Bay National Estuarine Research Reserve (NBNERR) in June 2004. The §312 evaluation process involves four distinct components:

- An initial document review and identification of specific issues of particular concern;
- A site visit to Rhode Island including interviews and a public meeting;
- Development of draft evaluation findings; and
- Preparation of the final evaluation findings, partly based on comments from the state regarding the content and timetables of recommendations specified in the draft document.

B. DOCUMENT REVIEW AND ISSUE DEVELOPMENT

The evaluation team reviewed a wide variety of documents prior to the site visit, including: (1) the federally approved Environmental Impact Statement and program documents; (2) financial assistance awards and work products; (3) semi-annual performance reports; (4) official correspondence; and (5) relevant publications on natural resource management issues in Rhode Island.

Based on this review and on discussions with NOAA's Office of Ocean and Coastal Resource Management (OCRM), the evaluation team identified the following priority issues:

- Major accomplishments during the review period;

- Status of the reserve's general administration, including grants, fiscal management and staffing;

- Status and visibility of research, education and stewardship programs, including local and system-wide initiatives such as the System-wide Monitoring Program and the Coastal Training Program;

- Status of land acquisition;

- Status of facilities development;

- Status of the management plan revision and compatibility of existing and planned uses;

- Status of the reserve's coordination with other federal, state and local agencies;

- Reserve's role at the local level and integration with its partners; and

- The manner in which NBNERR has addressed the recommendations contained in the §312 evaluation findings released in 2000.

C. SITE VISIT TO RHODE ISLAND

Notification of the scheduled evaluation was sent to the Rhode Island Department of Environmental Management (DEM), NBNERR, relevant federal environmental agencies, members of Rhode Island's Congressional Delegation and regional newspapers. In addition, a notice of NOAA's "Intent to Evaluate" was published in the *Federal Register* on July 16, 2004.

The site visit to Rhode Island was conducted on September 14-17, 2004. Ms. Rosemarie McKeeby, Evaluation Team Leader, OCRM National Policy and Evaluation Division; Ms. Laurie McGilvray, Chief, OCRM Estuarine Reserves Division; Ms. Doris Grimm, NBNERR Specialist, OCRM Estuarine Reserves Division; and Ms. Wendy Allen, Reserve Manager, North Inlet-Winyah Bay NERR composed the evaluation team.

During the site visit, the evaluation team interviewed NBNERR staff, senior DEM and other state officials, coastal researchers, university professors, nongovernmental organization representatives and private citizens. Appendix B lists persons and institutions contacted during this review.

As required by the Coastal Zone Management Act, NOAA held an advertised public meeting on September 15, 2004, at 12:00 p.m., at the NBNERR Field Station, 55 South Reserve Drive, Prudence Island, Rhode Island. The meeting gave members of the general public the opportunity to express their opinions about the overall operation and management of NBNERR. Appendix C lists individuals who registered at the meeting.

The support of NBNERR staff with the site visit planning and logistics is gratefully acknowledged.

III. RESERVE PROGRAM DESCRIPTION

A. THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

The Coastal Zone Management Act of 1972, as amended, established a system of National Estuarine Research Reserves (NERR) that are funded cooperatively by the National Oceanic and Atmospheric Administration (NOAA) and the host states or territories, which manage the reserves. The National Estuarine Research Reserve System has two primary missions: (1) to establish and maintain, through federal and state cooperation, a national system of reserves representative of various biogeographic regions in the United States; and (2) to conduct long-term research, educational and interpretive activities in support of national coastal zone management priorities.

Toward those missions, reserve sites are selected to represent the range of biogeographic regions, estuarine types and coastal management challenges occurring throughout the Nation. To date, NOAA has designated 26 NERRs that collectively protect more than one million acres of estuarine land and water. Two additional sites currently are in various stages of the designation process.

B. THE NARRAGANSETT BAY NATIONAL ESTUARINE RESEARCH RESERVE

1. Reserve Site Description

The Narragansett Bay National Estuarine Research Reserve (NBNERR) manages approximately 4,400 acres of land and water on and around Prudence, Patience, Hope and Dyer Islands in the center of Narragansett Bay. Often referred to as Rhode Island's most valuable natural resource, Narragansett Bay is a medium-sized, relatively deep, high salinity, temperate zone estuary. The Bay's watershed includes 1,657 square miles; 39 percent of the watershed is within Rhode Island, while 61 percent is in Massachusetts.

Prudence Island is approximately seven miles long and one mile across at its widest point. NBNERR manages 60 percent of Prudence Island. The reserve's Learning Center, which contains educational exhibits, a library that serves as a public meeting area, and research labs is located at the south end of the island.

The vegetation on Prudence Island reflects the extensive farming that occurred in the area until the early 1900s. Once the fields were abandoned, woody plants gradually replaced herbaceous species. The island's uplands are now covered with a dense shrub growth of bayberry, blueberry, arrowwood and shadbush interspersed with red cedar, red maple, black cherry, pitch pine and oak. Green briar and Asiatic bittersweet are also found throughout much of the island.

Prudence Island supports one of the densest herds of white-tailed deer in New England. Raccoons, squirrels, Eastern red fox, Eastern cottontail rabbits, mink and white-footed mice are plentiful. A variety of large wading birds, such as great and little blue herons,

snowy and great egrets, black crowned night herons, green backed herons and glossy ibis use the large salt marshes at the north end of the island as feeding areas. Between September and May, harbor seals use Prudence Island as a haul-out site.

The 207-acre Patience Island lies to the west of northern Prudence Island. Tall shrubs interspersed with red cedar and black cherry dominate the island. Common shrubs include bayberry, highbush blueberry and shadbush. Much of the island also is covered by brier, Asiatic bittersweet and poison ivy. A deciduous forest gradually is replacing the shrub habitat on some parts of the island. A small salt marsh on the southeastern shore provides habitat for seablite, a rare plant species in Rhode Island. Patience Island's uplands support a variety of wildlife such as white-tailed deer, red fox and Eastern cottontail rabbits. Migrant and wintering waterfowl species including horned grebes, greater scaup, black ducks and scoters use the island's coastal areas extensively. Quahogs are abundant in the sandy sediment.

Hope Island is a small, 91-acre island that lies west of southern Prudence Island. The island's topography is very irregular, with numerous low hills, ledges, rocky outcrops and a steep and rocky shoreline. One small freshwater wetland is located in an isolated depression in the south-central part of the island. Grasses compose much of the vegetation on the northern end of Hope Island, but other areas have shrubs such as bayberry, rose and poison ivy. The central part of the island contains tall shrubs and trees, including red cedar, staghorn sumac, shadbush and black willow. One stand of black locust occupies a low hill on the northern part of the island. Eastern cottontail rabbits live on the island, which also serves as one of the most significant wading bird nesting areas on the East Coast. In addition to egrets and herons, many black-backed and herring gulls nest on the rocks. During the winter, harbor seals occasionally use the exposed offshore rocks as haul-out and resting sites. Soft shelled clams, quahogs, American lobsters, striped bass, tautog, black-backed flounder and sea trout are abundant in the waters around Hope Island.

Low-lying, 28-acre Dyer Island is located nearly halfway between the south end of Prudence Island and Aquidneck Island. Although small, Dyer Island has significant ecological value as it supports one of Rhode Island's last remaining salt marshes without mosquito ditches. Coastal shorebirds, including the locally rare American oystercatcher, use the island as a nesting area.

2. Reserve Administration

NOAA designated NBNERR as the ninth reserve in the system and the first in the Virginian biogeographic region in 1980. Reserve staff carry out regular duties involving research, monitoring, education, outreach and stewardship. Reserve staff also conduct facilities operations and maintenance. As the reserve's lead state agency, the Rhode Island Department of Environmental Management (DEM) administers NBNERR. Many DEM divisions provide assistance for reserve operations, including:

- Management Services: Provides oversight on all NBNERR's financial assistance awards and processes awards and expenditures;
- Water Resources: Coordinates with NBNERR on cooperative water quality monitoring projects;
- Planning and Development: Provides architectural, engineering, construction and land acquisition services to NBNERR;
- Compliance and Inspection: Coordinates enforcement actions for a variety of environmental violations;
- Fish and Wildlife: Assists with several NBNERR stewardship activities, including prescribed fire management and deer management; and
- Law Enforcement: Provides enforcement support for NBNERR, including surveillance and response to violations.

IV. REVIEW FINDINGS, ACCOMPLISHMENTS AND RECOMMENDATIONS

A. OPERATIONS AND MANAGEMENT

1. Staff

Reserve staff are responsible for on-site development, operations and management of the Narragansett Bay National Estuarine Research Reserve (NBNERR). During the review period, NBNERR expanded its staff with dedicated, enthusiastic individuals. Permanent staff at the time of the site visit included the Reserve Manager, Principal Environmental Scientist, Education Coordinator, Research Coordinator, System-wide Monitoring Program (SWMP) Data Manager/Geographic Information System (GIS) Specialist, SWMP Technician/Wildlife Ecologist, Coastal Training Program (CTP) Specialist, Natural Resources Specialist and Caretaker. Additionally, three seasonal employees[1] assist with reserve operations during the summer. Increased staff have enabled the reserve to expand and to enhance its research, education and stewardship programs. Staff also work in a well-integrated manner to achieve program goals. The National Oceanic and Atmospheric Administration (NOAA) congratulates NBNERR for increasing its staffing.

ACCOMPLISHMENT: During the review period, NBNERR expanded its staff with dedicated, enthusiastic individuals. Increased staff have enabled the reserve to expand and to enhance its research, education and stewardship programs. Staff also work in a well-integrated manner to achieve program goals.

The Rhode Island Department of Environmental Management (DEM) currently supports less than two of the nine permanent staff at NBNERR. The Caretaker is a fully funded state employee. The Research Coordinator receives 80 percent of his funding from a grant through DEM. The remainder of the reserve's permanent staff is entirely supported by NOAA funds. NOAA acknowledges that Rhode Island, like many states, is facing difficult financial times. However, reserves that receive relatively consistent cash support from their lead agencies tend to be better positioned to make significant progress in program implementation, to undertake new initiatives and to respond to challenges. NOAA encourages DEM and NBNERR to identify: (1) staffing needs that may arise as the reserve's programs grow; and (2) ways to provide consistent, long-term support for reserve staffing and operations.

During the site visit, the evaluation team was surprised to learn that NBNERR did not use a competitive hiring process for contractual staff supported by NOAA funds. While NBNERR's current staff is composed of competent individuals, the lack of a competitive hiring process has the potential to create negative perceptions and may limit qualified applicants from consideration. Any perception that the reserve's hiring practices are not impartial and transparent can create credibility problems for the reserve. NOAA urges

[1] Naturalist, Naturalist Aide and Laborer

NBNERR to develop a competitive hiring process that can be instituted the next time the reserve fills a vacancy.

During the review period, NBNERR's Reserve Manager position was shared between the Reserve Manager and the Principal Environmental Scientist. The Reserve Manager explained that sharing the position was beneficial to the reserve because two part-time managers actually equal more than one full-time manager. However, NOAA has reservations about such an arrangement for core staff. A Reserve Manager has a crucial role in developing a vision for the site and in leading its programs forward. In practical terms, a Reserve Manager also serves as a primary decision-making point of contact for both reserve and NOAA staff. Sharing such a position can create an unclear vision for the reserve, a confusing reporting structure, and operational delays. At times, NOAA staff were unclear who was responsible for major projects such as the management plan revision. Subsequent to the evaluation site visit, both the individuals that had shared reserve management duties retired and left the manager position, which creates the opportunity to fill the Reserve Manager position with one qualified individual who has full-time responsibility for NBNERR. NOAA highly recommends that DEM and NBNERR arrange for the reserve to have one full-time manager.

1. PROGRAM SUGGESTION: NOAA encourages DEM and NBNERR to develop a staffing plan that identifies: (1) the Reserve Manager as a single, full-time position; (2) staffing needs that may arise as the reserve's programs grow; (3) ways to provide consistent, long-term support for reserve staffing and operations; and (4) a competitive process for recruiting new staff.

Participation in and contribution to system-wide efforts such as planning, development and implementation are important aspects of being part of the National Estuarine Research Reserve System (NERRS). The Reserve System holds several system-wide working meetings throughout the year that serve as primary venues for system-wide planning and budgeting decisions. NOAA considers reserve core staff[2] attendance at these meetings to be critical. Thus, NOAA makes reserve core staff attendance at Reserve System-wide meetings a condition of each operations grant and provides federal funding for the travel. In addition, it is very beneficial for Stewardship and CTP Coordinators to attend NERRS meetings. Unfortunately, before the NBNERR Manager retired, he stopped attending NERRS meetings, and other core staff attendance has been inconsistent. NBNERR not only is disadvantaged by a lack of attendance at system-wide meetings, it also deprives the NERRS of input from one of its sites during critical decision-making and planning. NOAA strongly urges the NBNERR Manager and core staff to regularly attend Reserve System-wide meetings.

2. PROGRAM SUGGESTION: NOAA strongly urges NBNERR's Manager and core staff to regularly attend Reserve System-wide meetings. When possible, the Stewardship Coordinator and CTP Coordinator also should attend Reserve System-wide meetings as well.

[2] Reserve Manager, Research Coordinator and Education Coordinator.

2. Advisory Committee

In the NERRS, Advisory Committees play an important role in the federal-state partnership. In general, the purpose of an Advisory Committee is to counsel a reserve's lead state agency regarding the preparation and implementation of specific reserve plans. An Advisory Committee composed of diverse and dedicated individuals also can significantly assist a reserve in furthering its mission and increasing its visibility.

NBNERR has not had a functioning Advisory Committee in place for some time. According to the reserve's 1998 management plan, a Reserve Advisory Committee (RAC) was established to advise DEM on management and development of the reserve and its programs. The plan notes that DEM's Director will convene meetings of the RAC as necessary to obtain advice on specific issues. The Director also may convene a sub-group of the RAC to address specific issues. The management plan states that the Director will appoint RAC members for a one-year period, such that the Committee will be composed of:

The DEM Director's designee;
The DEM Associate Director for Natural Resource Management;
The DEM Associate Director for Planning and Administrative Services;
The DEM Associate Director for Water Quality Management;
The DEM Associate Director for Regulations;
A representative of the Narragansett Bay Project;
A representative of the DEM Division of Fish, Wildlife and Estuarine Resources;
A representative of the Coastal Resources Management Council;
A representative of the Prudence Conservancy;
A representative of The Nature Conservancy;
A representative of the Rhode Island Historical Preservation Commission;
A representative of shellfishing interests;
A representative of the Prudence Island Planning Commission;
A representative of the scientific community;
A representative of the education community;
A representative of NOAA;
A representative of the U.S. Environmental Protection Agency; and
Two representatives of conservation and recreation groups.

Given that an Advisory Committee plays an important role in the federal-state reserve partnership and can greatly assist a reserve in furthering its mission and increasing its visibility, NOAA highly recommends that NBNERR re-establish its Advisory Committee as soon as possible. With a diverse membership that includes representatives from Prudence Island, the Committee could help the reserve improve its links to the community while fostering a greater sense of local involvement in the reserve. The Advisory Committee should play an important role in the process for revising the management plan.

3. PROGRAM SUGGESTION: NOAA highly recommends that NBNERR re-establish its Advisory Committee as soon as possible. Committee membership should include community representatives.

3. Management Plan

NERRS regulations require each reserve to have a NOAA-approved management plan that must be updated every five years. A reserve's management plan has three primary functions: (1) to provide a framework for the direction and timing of the reserve's programs; (2) to allow the Reserve Manager to assess how successfully the reserve's goals have been met and to determine any necessary changes in direction; and (3) to guide programmatic evaluations of the reserve. The plan must describe the reserve's goals, objectives and management issues. It must also identify the reserve's intended strategies for research, education and interpretation, public access, construction, acquisition and resource preservation, restoration and manipulation. Additionally, the plan is required to describe staff roles in each of these areas.

NBNERR's revised management plan, reflecting the reserve's vision and strategy for 2004-2007 was due in 2004. At the time of the evaluation site visit, the Reserve Manager noted that the plan should be revised in the context of the Governor's many Narragansett Bay initiatives. In addition, there is interest in adding Rome Point, state owned property on the mainland, into the reserve boundary. However, NBNERR had not yet developed a process for revising the management plan or directed funds to this mandatory task.

During the public meeting, many residents of Prudence Island attended and spoke about uses of the reserve property. Some residents spoke positively about reserve education and interpretive programs and expressed an interest in learning more about research and monitoring projects being conducted at the reserve. Other residents expressed concerns regarding woodcutting, access for hunting, camping, maintenance of firebreaks, road signs, nearshore areas marked for seagrass protection, and deer ticks and related diseases. The comments indicated a need to increase effective communication between the reserve and island residents about reserve programs and land management practices. Local understanding of the mission of the reserve and responsibilities as a National Estuarine Research Reserve is essential to managing multiple uses of reserve property. Comments at the public meeting also indicated a need for meaningful community involvement in the development of a revised management plan.

NBNERR must develop a strategy that includes meaningful community involvement and a timeline for revising its management plan. Once such a strategy is developed, NBNERR should complete the management plan revision as soon as possible, but no later than 18 months following the receipt of final evaluation findings.

4. NECESSARY ACTION: Within one month of receipt of final evaluation findings, NBNERR must submit a strategy and timeline for revising its management plan to NOAA. The strategy must describe a process for community involvement. Once the strategy and timeline are complete, NBNERR must provide updates on the management plan's revision process in its semi-annual performance reports. The plan must be completed no later than 18 months following receipt of the final evaluation findings, unless a modification to the deadline is approved by NOAA.

4. Facilities

In 1972, the U.S. Navy relinquished a base on Prudence Island and gave the land to the State of Rhode Island. In 1992, NBNERR expanded to include the south portion of Prudence Island and acquired several dilapidated buildings and docks that had been part of the Navy base. In 1993, DEM's Division of Planning and Development completed a master plan to assess the facilities' existing conditions and to identify necessary renovations and construction. Given funding constraints, the facilities plan outlined a phased approach.

Phases I and II: These phases were designed to address health and safety issues, to undertake emergency repairs and to provide facilities to support the reserve's mission. Asbestos was removed from existing buildings. Emergency roof repairs were made to both the caretaker's cottage and the visiting researchers' cottage. Half of a large building was renovated to create 2,500 square feet of useable space to support basic reserve functions; renovations included a learning center with educational displays, biological research laboratory, office, computer room, lavatories and support areas. [3]

Phase III: This phase involved extensive renovations to both the caretaker's cottage and the visiting researchers' cottage to provide safe and energy-efficient living quarters. This phase also included asbestos removal and the demolition of an unsafe building that formerly served as a Navy mess hall.

Phase IV: During this phase, the reserve oversaw the renovation of additional space in the field station. A water quality monitoring lab, natural resources lab, storage space and library were constructed.

Phase V: The reserve completed field station renovations during this phase. Further asbestos removal, lead abatement and demolition of a garage also were conducted. Some asbestos removal and lead abatement were started for a structure to be replaced under Phase VI.

Phase VI: The purpose of this phase is to complete asbestos removal, lead abatement and demolition of an unsafe metal building. A new steel frame structure that will support reserve operations will be built using U.S. Green Building Council standards.

[3] The reserve completed Phases I and II of its facilities construction plan prior to the current evaluation review period.

NBNERR significantly enhanced its facilities by completing Phases III-V and beginning Phase VI during the review period. The reserve also assisted the Audubon Society of Rhode Island (ASRI) with the development of its Estuarine Environmental Education Center in Bristol, which includes an excellent exhibit about the reserve and its habitats. NOAA congratulates the reserve for its cooperative efforts with partners such as the DEM Division of Planning and Development and ASRI to improve reserve facilities.

ACCOMPLISHMENT: NBNERR worked cooperatively with partners such as the DEM Division of Planning and Development and ASRI to improve reserve facilities during the review period.

During Phase VI of the facilities plan, NBNERR reprogrammed its construction grant in response to the plan to implement a long-term watershed strategy to protect Narragansett Bay developed by the Governor's Commission. The plan identified NBNERR's south Prudence Island unit as a key location for public access, education, research and monitoring needed for the protection of Narragansett Bay. The reprogramming postponed the building of a steel frame structure in order to focus on the development of waterfront facilities around Prudence Island's T-wharf and the reserve's education kiosk.[4] The new construction project will renovate the T-wharf to allow: (1) vessels of up to 80 feet in length to berth; and (2) visitors safe public access by water to the reserve. The project also will enhance the education kiosk and create exhibits that will display real-time water quality monitoring, weather and navigation data.

Increased visitation to a reserve often results in a variety of benefits, including enhanced visibility for the site and its programs. However, recognizing that increased visitation also can present challenges for a reserve, the evaluation team noted two issues that NBNERR and DEM should address prior to efforts to bring more visitors to the reserve. First, NBNERR and DEM should consider the capacity of the reserve's staff, facilities and programs to handle more visitors. The second consideration is public health. As noted in §III-B-1, Prudence Island supports one of the densest herds of white-tailed deer in New England. An unfortunate corollary is that residents of and visitors to Prudence Island are at significant risk of contracting serious, debilitating tick-borne illnesses such as Lyme disease, babesiosis and erlichiosis. NOAA strongly recommends that NBNERR undertake a study that thoroughly examines the potential impacts of increased visitation given the considerations described above.

5. PROGRAM SUGGESTION: NOAA strongly recommends that NBNERR and DEM conduct a study that thoroughly examines: (1) the capacity of the reserve's staff, facilities and programming to handle increased visitation; (2) the public health risk of increasing visitation in an area where people are at significant risk of contracting one or more debilitating tick-borne illnesses. Such a study should be a component of the impact analysis to be completed during the management plan revision.

[4] NBNERR's facilities include an education kiosk located adjacent to the T-wharf fishing pier at the south end of Prudence Island. A DEM Naturalist staffs the kiosk, which is open during the summer. The building houses two aquaria, a touch tank and exhibits about Narragansett Bay.

5. Grants Management

In general, NBNERR achieved the desired results from funded grant tasks and built upon established projects. However, during the review period, the reserve often needed extra time to complete grant tasks, which led to NBNERR having several grants open at once. NBNERR must work towards resolution of the issues surrounding the timely completion of grant tasks as soon as possible. Repeatedly having multiple open grants due to incomplete grant tasks can affect the reserve's ability to receive future funding.

Upon receipt of a NOAA operations or facilities grant, a reserve is required to submit semi-annual performance reports describing the status of each grant task. Performance reports are useful both to NOAA and to the reserve because they provide a consolidated source of information on accomplishments related to financial assistance awards. The previous evaluation of NBNERR noted that the reserve must resolve two grants management issues: (1) submitting performance reports late, and (2) submitting several reports combining two or more reporting periods. Such actions do not adhere to the terms of the awards. Unfortunately, NBNERR did not sufficiently address these issues during the current review period. The reserve must begin submitting performance reports covering only the relevant reporting period on time.

6. NECESSARY ACTION: NBNERR must work towards resolution of the issues surrounding the timely completion of grant tasks as soon as possible. Upon receipt of final evaluation findings, NBNERR also must immediately begin submitting performance reports on time. Performance reports must cover the relevant reporting period only.

6. Program Coordination

NBNERR coordinates well among reserve programs and with external partners. The reserve's staff regularly collaborate with and assist one another with program planning and implementation, resulting in the integration of NBNERR's core programs. During the site visit, the evaluation team was pleased to see key linkages among the programs that are essential to the reserve's mission of maintaining a stable environment in which to conduct research and translate it to the public. NBNERR also coordinates to varying extents with external partners such as other DEM divisions, Rhode Island Sea Grant, the Narragansett Bay National Estuary Program, the University of Rhode Island, Save the Bay, ASRI, the Prudence Conservancy and the Rhode Island Coastal Resources Management Council. NOAA commends NBNERR for its coordination among its core programs and with a wide variety of external partners and encourages it to continue and to enhance such efforts.

As described in §III-B-2, a number of DEM divisions provide support to NBNERR for enforcement, planning and development, legal services and permitting issues. During the public meeting, several issues were raised that may best be addressed by different divisions of DEM working in collaboration with the reserve. For example, deer management, hunting programs and enforcement are most appropriately handled by other divisions in DEM, with significant input from the reserve to ensure that the actions are

compatible with the mission and purposes of the reserve. DEM potentially could provide greater assistance to NBNERR with regard to enforcement and wildlife management issues. Given that DEM is undergoing a reorganization, a good opportunity exists to identify ways in which the Department might better address wildlife management and public health issues of importance both to NBNERR and stakeholders in the region. The results of such a review should be incorporated into the reserve's revised management plan.

B. RESEARCH AND MONITORING PROGRAM

NBNERR's Research and Monitoring Program is based upon five goals: (1) promote opportunities for basic and applied research to advance the understanding of estuarine processes; (2) support the use of the reserve as a natural laboratory and reference site to assess environmental quality status and trends; (3) encourage and assist in a science-based multi-agency approach to ecosystem and watershed management to protect Narragansett Bay; (4) develop and integrate appropriate scientific and technical information into coastal decision-making; and (5) transfer scientific and technical information to the general public through integration with the reserve's Education and Outreach Program.

During the review period, the Research and Monitoring Program benefited from increased staffing and improved facilities. However, while the program has a very strong monitoring component, there clearly is room for the research element to grow. There currently are several factors that create barriers to research at NBNERR. For example, as described in §IV-A-4, residents of and visitors to Prudence Island are at significant risk of contracting serious, debilitating tick-borne illnesses such as Lyme disease, babesiosis and erlichiosis. This has proven to be a major deterrent to visiting scientists. Furthermore, the logistics of conducting research on an island are challenging. Recent efforts by reserve staff to better control access to the reserve may have the unintended consequence of deterring scientists. Better coordination and communication with interested researchers could address these issues. Additionally, the Research Coordinator is committed to working on a major project with DEM's Emergency Response Program. While this work is very applicable to the development of the reserve's site profile, it leaves less time for the Research Coordinator to work on other projects and cultivate research opportunities by other scientists.

During the site visit, Research and Monitoring Program staff suggested that access to a boat and dock space in the town of Wickford would enhance research at NBNERR. Staff also believe that the incorporation of Rome Point[5] within the reserve's boundaries would provide an excellent opportunity to increase NBNERR's research productivity. NOAA recommends that the Research and Monitoring Program enlist both current and potential reserve researchers to explore these and other options for increasing research at NBNERR. Following such a dialogue, the Research and Monitoring Program should develop a plan to expand the reserve's research potential and productivity. A research

[5] DEM has proposed the incorporation of Rome Point, an area on Rhode Island's mainland, within NBNERR.

advisory committee could be employed to assist with this action, to provide input for the management plan, and also to provide ongoing support and advice to the Research and Monitoring Program.

7. PROGRAM SUGGESTION: The Research and Monitoring Program should work with the local and regional research community to explore options for increasing research at NBNERR. The Research and Monitoring Program should develop a plan to expand the reserve's research potential and productivity. The Research and Monitoring Program should establish a research advisory committee to assist with this action, provide input for the management plan, and provide ongoing support and advice.

1. System-wide Monitoring Program (SWMP)

NERRS national programs and initiatives are developed in collaboration with all reserves and NOAA. One example of a system-wide effort is SWMP. The goal of SWMP is to identify and track short-term variability and long-term changes in estuarine water quality, habitat and land use in each reserve. The data gathered through SWMP provides information about how estuaries function and change over time, enabling scientists to predict how these systems will respond to anthropogenic changes.

SWMP provides critically needed, standardized information on national estuarine environmental trends while allowing the flexibility to assess coastal environmental management issues of regional or local concern. Designed to enhance the value and vision of the NERRS as a system of national reference sites, this program has three components and a phased approach to implementation. The three components are:

(1) Abiotic Variables: SWMP currently measures pH, conductivity, temperature, dissolved oxygen, turbidity, water level and atmospheric conditions. In addition, the program collects monthly nutrient and chlorophyll samples and monthly diel samples at one SWMP data logger station. Each reserve uses a set of automated instruments and weather stations to collect these data for submission to the Centralized Data Management Office (CDMO).

(2) Biotic Variables: As funds become available, the reserve system also will incorporate monitoring of organisms and habitats into SWMP. The first aspect likely to be incorporated will quantify vegetation (e.g., marsh vegetation, submerged aquatic vegetation) patterns and their changes over space and time. Other aspects that could be incorporated include monitoring infaunal benthic communities and plankton communities.

(3) Habitat Mapping and Change: This component of SWMP will be developed to identify changes in coastal ecological conditions with the goal of tracking and evaluating changes in coastal habitats and watershed land use. The main objective of this element will be to examine the links between watershed land use activities and coastal habitat quality.

NBNERR deploys four data loggers that measure water level, pH, temperature, conductivity, dissolved oxygen and turbidity. The reserve's four SWMP stations are located at: (1) Potter's Cove, which is affected by boating waste; (2) Nag Creek, a tidal marsh, (3) the water surface at the T-wharf; and (4) the water bottom at the T-wharf. The data loggers are retrieved, cleaned, calibrated and repositioned on a regular basis. An automated on-site weather station collects meteorological parameters including air temperature, wind speed, wind direction, relative humidity, barometric pressure, photosynthetically active radiation and precipitation at 15-minute intervals for the entire year. All data is submitted to the CDMO at Baruch Marine Laboratory in South Carolina for inclusion in the national NERRS database.

NBNERR's participation in SWMP serves as an excellent example of a Reserve System-wide initiative supporting a state endeavor. The Research and Monitoring Program has been a proactive and valued contributor to the Narragansett Bay collaborative monitoring effort. SWMP and the CDMO's technician training and data management protocols are serving as models for Rhode Island's "Bay Window" Program.[6] NBNERR's SWMP Data Manager/GIS Specialist is leading the data management efforts for this program as well as maintaining the reserve's water quality monitoring stations. The Research and Monitoring Program has been recognized throughout Rhode Island for its monitoring and data quality control analysis. NOAA commends the Research and Monitoring Program for its strong role in Narragansett Bay's collaborative monitoring effort and encourages the reserve to remain fully engaged in the state's monitoring programs for the Bay.

ACCOMPLISHMENT: The Research and Monitoring Program has been a proactive and valued contributor to the Narragansett Bay collaborative monitoring effort. SWMP and the CDMO's technician training and data management protocols are serving as models for Rhode Island's "Bay Window" Program. The reserve should remain fully involved in the state's monitoring programs for the Bay.

2. Site Profile

NERRS implementing regulations require each reserve to develop a comprehensive site profile. The reason for developing a site profile is to enhance research efforts by generating inventory information and assimilating baseline data about a reserve's resources and habitats. A site profile is designed to: (1) compile scientific datasets relating to the reserve, (2) characterize the physical and biotic components of the environment, (3) synthesize the known ecological relationships within the reserve and its watershed, (4) trace the impact of natural and human disturbances, and (5) explore the need for future research, education and management initiatives.

In general, the completion of a site profile occurs in two stages:

[6] The "Bay Window" or Cooperative Bay Program gathers broad, comprehensive data on the state of Narragansett Bay.

- Environmental Characterization: This stage requires a literature search and review of all existing research and field data. The environmental characterization also involves the compilation of all information describing the geology, biology, chemistry, geomorphology and hydrology of the reserve.

- Site Profile Development: This stage requires a synthesis of information gathered during the environmental characterization. The resultant document will illustrate the reserve in terms of its resources, management issues, constraints and research needs.

NBNERR's site profile has been under development for quite some time, and the 2000 final evaluation findings stressed the importance of completing the site profile prior to the reserve's next evaluation. At the time of the evaluation site visit, the Research and Monitoring Program had completed the environmental characterization and was beginning the site profile development stage. The Research Coordinator, in collaboration with a volunteer and the University of Rhode Island, is writing the document and plans to complete the draft in Spring 2005. Given that this task has been pending for more than ten years, the Research and Monitoring Program must develop a timeline that provides for completion of the site profile within a year following the receipt of final evaluation findings.

8. NECESSARY ACTION: Within one month of receipt of final evaluation findings, the Research and Monitoring Program must submit a timeline for completing the site profile to NOAA. Once the timeline is developed, NBNERR must provide updates on the site profile's status in its semi-annual performance reports. The site profile must be completed within a year following the receipt of final evaluation findings.

3. Graduate Research Fellowships (GRF)

The NERRS GRF Program supports management-related research projects that enhance scientific understanding of the reserve system, provide information needed by reserve managers and coastal decision-makers, and improve public awareness and understanding of estuarine ecosystems and management issues. GRF funds are available on a competitive basis to students enrolled in a full-time Masters or Doctoral program at accredited colleges and universities in the United States. Fellowships may be funded for up to three years. Applicants must address one of the nationally significant research priorities established by the NERRS and conduct research in one or more reserves. Research priorities include:

(1) The effects of nonpoint source pollution on estuarine ecosystems and the role of estuarine ecosystems in mitigating this pollution;
(2) Evaluative criteria and/or methods for estuarine ecosystem restoration;
(3) The importance of biodiversity and the effects of invasive species on estuarine ecosystems;
(4) Mechanisms for sustaining resources within estuarine ecosystems; and
(5) Socioeconomic research on estuarine ecosystems.

The Research and Monitoring Program supported a total of five students[7] by the time of the evaluation site visit. The reserve's GRFs have conducted research on a variety of topics, including the ecology of cobble-beach plant communities, salt marsh trophic dynamics, the ecology of migratory salt marsh sharp-tailed sparrows and the use of isotopic signatures to identify different nitrogen sources to Narragansett Bay. As described earlier in these findings, NBNERR's location and deer tick problem present significant challenges for a program trying to attract additional researchers. However, NOAA encourages the Research and Monitoring Program to investigate possibilities for increasing participation in the GRF Program at NBNERR. Such an investigation should be a component of the plan to expand the reserve's research potential and productivity.

C. EDUCATION AND OUTREACH PROGRAM

NBNERR's Education and Outreach Program's primary goal is to increase the understanding and appreciation of Narragansett Bay and the Narragansett Bay Watershed, associated upland habitats, and estuaries in general. In order to accomplish this goal, NBNERR works to:

- provide hands-on experiences, accurate and current information, and educational products related to Narragansett Bay and the issues that impact the reserve and the Bay's watershed;
- provide useful materials, tools and techniques to coastal decision-makers in the Narragansett Bay watershed and throughout the region to promote informed decision-making; and
- collaborate with other organizations to develop and implement estuarine education and interpretation programs.

The reserve's Education Coordinator position is the result of a cooperative agreement between NBNERR and ASRI. During the review period, the Education and Outreach Program continued to offer annual summer programs including walking tours of the reserve, fishing contests, nature camp, bike tours, bird watching tours, wetland walks, beach combing and seining programs. Many of the summer programs are facilitated by the reserve's seasonal Naturalist who staffs the education kiosk at the T-wharf. Off-season programs included coastal clean-ups, National Estuaries Day Celebrations, seal and waterfowl tours, and special presentations at the Audubon Environmental Education Center. NBNERR also hired a seasonal Naturalist Aid through ASRI to assist the Education Coordinator in exhibit design and installation, program facilitation, and upkeep of the reserve's Learning Center.

1. Coastal Decision-maker Workshops (CDMW)

During the review period, one of the Education and Outreach Program's primary mechanisms for reaching adult audiences was through CDMWs. The purpose of CDMWs is to provide current environmental information to local decision-makers.

[7] NBNERR supported three of its five GRFs during the review period.

Examples of specific issues that the program has addressed through CDMWs include land use, invasive species and water quality monitoring. The reserve did not conduct multiple workshops over a two-year period prior to the Narragansett Bay Summit, but instead considered involvement in the Summit to substitute for individual workshops. Subsequently, NBNERR partnered with the University of Rhode Island's Coastal Institute to host the Ocean of Knowledge lecture series for coastal decision-makers. The reserve also offered several workshops in partnership with local organizations.

2. Coastal Training Program (CTP)

The NERRS Coastal Training Program, which builds upon the success and experience of CDMWs, is a key component of NERRS' education efforts. CTP is designed to improve coastal stewardship at local and regional levels by increasing the application of science-based knowledge and skills by coastal decision-makers and to increase dialogue and collaboration among decision-makers. Planning for the program includes:

- Establishing a training advisory committee;
- Conducting a market survey of training providers and an audience needs assessment;
- Developing a program strategy that outlines priority coastal issues to be addressed during the next three to five years; and
- Prioritizing audiences that the reserve plans to target with relevant programs, as well as a marketing plan.

In 2000, NBNERR participated extensively in the Narragansett Bay Summit, which was designed to identify the bay's key environmental issues. The Education and Outreach Program linked its participation in the summit to the development of the Narragansett Bay Watershed CTP (NBWCTP). Members of the training advisory committee include the University of Rhode Island's Sea Grant Program, Rhode Island Association of Conservation Commissions, Grow Smart Rhode Island, University of Rhode Island's Cooperative Extension Center, Rhode Island Coastal Resources Management Council, Rhode Island Rivers Council and Rhode Island Coastal Resources Center.

During the review period, the Education and Outreach Program conducted a market analysis of the current coastal training environment in Rhode Island. The analysis catalogued the suppliers of coastal resource management training and education in Rhode Island; identified "gaps" or disparities in the market; and offered recommendations on methods to address the gaps. The Education and Outreach Program also conducted a coastal training needs assessment, which expanded upon the findings of the market analysis by evaluating training needs and skill requirements of coastal decision-makers. The needs assessment identified wetlands ecology, invasive species, endangered species, town-wide greenways, recreation and tourism, and water quality and quantity as priority coastal issues for Rhode Island. The needs assessment also identified the target audiences'[8] preferred methods of information delivery, including an interactive web site,

[8] Representatives of municipal government, conservation and harbor commissions, economic development and zoning boards and municipal land trusts.

pamphlets, brochures and workshops. Finally, the Education and Outreach Program developed the NBWCTP strategy document, which defines the program's vision, role, issues, audience, timeframe and objectives.

During the latter part of the review period, NBNERR hired a CTP Specialist to work with the Education and Outreach Program, which subsequently began full implementation of the NBWCTP. In response to the results of the needs assessment, the Education and Outreach Program developed a NBWCTP website and brochure and continued to offer workshops. At the time of the site visit, NBNERR was planning workshops on docks and piers, vegetated coastal buffers and nutrients in Narragansett Bay. The Education and Outreach Program also created a traveling exhibit to increase NBWCTP's visibility and began to work with the Waquoit Bay NERR to plan cooperative training events.

NOAA commends the Education and Outreach Program for linking its participation in the Narragansett Bay Summit to the development of NBWCTP. NOAA encourages the Education and Outreach Program to fully enlist the skills of the representatives on the training advisory committee, particularly the Rhode Island Coastal Management Program and Sea Grant Program, to continue to explore innovative and collaborative ways to implement the Coastal Training Program.

3. Community Outreach

While the Education and Outreach Program has traditionally offered classroom programming, its priorities shifted from K-12 education to community outreach during the latter half of the review period. In order to focus on outreach, the Education and Outreach Program established strong, mutually beneficial partnerships with several organizations and agencies to address K-12 education for the reserve. Such partners include ASRI, Save the Bay and Friends of the Branderis. The Education and Outreach Program recently enhanced its community outreach activities on Prudence Island by developing exhibits based on photographs, paintings, and other artwork created by local artists as well as on historical photographs and documents provided by the Prudence Island Historical Society. The Education and Outreach Program offered presentations based on the exhibits. The installation of education kiosks around Prudence Island also assisted with information dissemination. Other outreach activities included designing a new website, publishing a series of fact sheets featuring reserve research and stewardship, developing materials for the traveling exhibit, and creating an educational poster on the importance of eelgrass. NOAA commends the Education and Outreach Program for its recent emphasis on outreach.

ACCOMPLISHMENT: Recognizing a need in the local community, the Education and Outreach Program shifted its focus from K-12 education to outreach during the review period. The Education and Outreach Program established strong, mutually beneficial partnerships with several organizations and agencies to address K-12 education for the reserve and shifted its focus to outreach activities such as designing a new website, publishing a series of fact sheets and developing an educational poster.

Based on comments expressed during the site visit's public meeting, the residents of Prudence Island appreciate and take advantage of many of the reserve's educational opportunities. They are also eager to learn more about the reserve's programs and would like to be more involved with reserve activities. The interest voiced by members of the Prudence Island community presents an excellent opportunity for the reserve to engage residents more in program planning and volunteer activities that promote stewardship of the area that is their home. As previously noted in §IV-A-2, a reserve Advisory Committee with representatives from the Prudence Island community would improve communication between the reserve and local citizens. An education subcommittee could be established and supplemented with interested stakeholders to provide additional support and ideas to enhance the Education and Outreach Program. The revised management plan is the appropriate place to outline plans for such a subcommittee. The Education and Outreach Program has recognized that an enhanced and innovative outreach approach to the local community is required. Given the shift in programming priorities from K-12 education to outreach, it is important for the Education and Outreach Program to identify new goals and to evaluate how each activity furthers those goals. The revised management plan should address the Education and Outreach Program's updated goals and activities with regard to planned boundary expansions, improved reserve facilities and new opportunities that will be created as partners like Save the Bay expand their facilities and programs.

9. PROGRAM SUGGESTION: NOAA strongly encourages the Education and Outreach Program to identify new goals and to evaluate how each activity furthers those goals given the shift in program priorities from K-12 education to community outreach. The revised management plan should address the Education and Outreach Program's current goals and activities with regard to planned boundary expansions, improved reserve facilities and new opportunities that will be created as partners like Save the Bay expand their facilities and programs.

D. STEWARDSHIP PROGRAM

During the last several years, the NERRS has focused on developing a stewardship component to complement its existing research and education programs. NBNERR's Stewardship Program works to improve resource management at the reserve and to provide the local community with information and tools that help members protect the environment. The primary goals of the reserve's Stewardship Program are to: (1) protect and preserve the diverse estuarine habitats representative of the region; (2) restore or manipulate the structure and functional diversity and dynamics of native biotic communities in reserve lands and waters to emulate the ecological conditions of specific periods in time; and (3) participate and cooperate with resource protection activities for the Narragansett Bay ecosystem and watershed. NBNERR's primary stewardship efforts focus on restoration, endangered species and habitat protection, invasive species control and trail and beach maintenance.

1. Restoration

One of the Stewardship Program's signature projects during the review period was the restoration of Potter Pond. In March 2003, the Stewardship Program restored tidal flow to an impounded pond and marsh complex along the south shore of Potter Cove on Prudence Island. Prior to the restoration, crushed culverts prevented tidal flow between the pond and Narragansett Bay. This resulted in poor water quality, zero-oxygen conditions and degraded fish communities in the pond. The installation of a larger culvert restored proper tidal exchange to the pond and increased the tidal range from one centimeter to approximately three feet. A second set of new culverts also was installed to return tidal exchange to an impounded *Phragmites* marsh upstream from Potter Pond. The Stewardship Program expects that, over time, salt marsh vegetation will return along with fish, crustaceans and birds that rely on this coastal wetland habitat. The Stewardship Program, working with the Research and Monitoring Program, will monitor the ecological changes associated with the restoration.

During the latter part of the review period, the Stewardship Program also focused on restoring grasslands and wet meadows, both of which are rapidly disappearing throughout Rhode Island. Grasslands on Prudence Island are dominated by little bluestem and switchgrass. The Stewardship Program began restoring small areas of grasslands and a small wet meadow on Prudence Island by stopping traditional weekly mowings of more than seven acres on the south end of the island. The restoration plan calls for mowing the area once every one to two years in order to allow natural growth. After one season of growth, the parcels provided habitat for the rare golden aster, meadow vole, butterflies and moths. The restoration areas also provided food for a variety of birds such as kestrels, red-tailed hawks and barn swallows. The Stewardship Program is studying the possibility of restoring up to 65 more acres of grasslands on Prudence Island.

2. Habitat Inventory

During the review period, the Stewardship Program collected and organized habitat information in order to improve stewardship planning and restoration efforts. Staff conducted an inventory of the reserve's natural and modified habitats. The Stewardship Program's objectives for the survey were to provide: (1) a tool for contemporary analysis and management; (2) a baseline for future surveys and interpretive comparison to aerial photo archives; (3) a comprehensive classification protocol; and (4) a means of communicating geographic references both within NBNERR and among the reserve and other organizations.

The Stewardship Program designed a habitat classification scheme with the assistance of Dr. Francis Golet, co-author of *Classification of Wetlands and Deep-water Habitats of the U.S.*[9] While the Stewardship Program largely based NBNERR's scheme upon the Cowardin classification scheme, it expanded the reserve's classification to include upland and modified habitats. NBNERR's classification also has a habitat category to describe common plant assemblages, many of which were identified by the Rhode Island Natural

[9] Cowardin et al., 1979

Heritage Program. The classification scheme is hierarchical and organized in a strictly numerical outline format, which allows easy statistical and organizational queries when applied to GIS datasets. GIS data so organized can be viewed at any of several levels of detail and can be manipulated to display and run statistics on many combinations of parameters. Additionally, the Stewardship Program added attributes beyond the classification scheme to the GIS dataset, such as an invasive species modifier that allows staff to monitor for certain nuisance plants like *Phragmites*. The Stewardship Program plans to publish an article about the development and utility of NBNERR's classification system as well as the potential application of its format to other inventory projects. NOAA commends the Stewardship Program for conducting a habitat inventory and developing a habitat classification scheme for planning and resource management.

ACCOMPLISHMENT: The Stewardship Program conducted a habitat inventory of the reserve and designed a specific habitat classification scheme that has allowed staff to enhance stewardship planning and resource management at NBNERR. Stewardship activities were well coordinated with the Research Coordinator to take full advantage of research and monitoring opportunities.

3. Deer Management

As described previously in several sections of this document, Prudence Island supports one of the densest herds of white-tailed deer in New England. Both residents of and visitors to Prudence Island are at significant risk of contracting serious, debilitating tick-borne illnesses such as Lyme disease, babesiosis and erlichiosis. Thus, deer management is a serious and complicated issue for NBNERR's Stewardship Program.

During the review period, the Stewardship Program worked with DEM's Division of Fish and Wildlife to address the impacts of white-tailed deer overpopulation on the island. Staff prepared a document for Prudence Island residents that described both the ecological and health impacts of deer overpopulation. The document also provided examples of experiments conducted in other locations that reduced herd size with a resultant reduction in deer tick populations.

The Stewardship Program also developed a detailed questionnaire targeting users of Prudence Island in order to gauge the public's feelings about the deer herd. Prior to the development of the questionnaire, the deer herd had been targeted for reduction. However, a small, vocal group of Prudence Island residents successfully lobbied against the reduction. That event served as a catalyst for the Stewardship Program to launch an effort to determine attitudes regarding the deer herd of as many people associated with Prudence Island as possible. The Stewardship Program received 182 completed questionnaires revealing that respondents were very concerned about public health and supported herd reduction. Staff shared the questionnaire results with DEM's Division of Fish and Wildlife, which decided to: (1) increase individual quotas for hunters, (2) increase incentives for hunters to take more does, and (3) open additional land to hunters. The Stewardship Program also contacted the Rhode Island Department of Public Health regarding the prevalence and pervasiveness of tick-borne illnesses on Prudence Island, but it had not received a response by the time of the site visit.

During the public meeting and in written comments received following the site visit, the evaluation team heard a number of concerns from Prudence Islanders regarding deer management. For example, while residents are generally concerned about public health and supportive of a reduction in herd size, many expressed reservations about the decision to open the land known as the Heritage Property to hunters. Residents cited the fact that the Heritage Property abuts the island's school and playground and is one of the few areas where people can walk during hunting season without concern of becoming involved in a hunting accident as reasons for their concern. Additionally, many islanders' perception of lax enforcement on the island compounds the issue. As previously noted, deer management, hunting programs and enforcement are most appropriately handled by DEM with input provided by NBNERR. NOAA strongly encourages the Stewardship Program and DEM to work collaboratively with the residents of Prudence Island to develop an effective deer management program that not only reduces the herd to an optimal size, but also addresses concerns held by residents. NOAA also encourages the Stewardship Program and DEM to renew efforts to enlist the assistance of the Rhode Island Department of Public Health in addressing the prevalence of tick-borne illnesses on Prudence Island.

10. PROGRAM SUGGESTION: NOAA strongly encourages the Stewardship Program and DEM to work collaboratively with the residents of Prudence Island to develop an effective deer management program that not only reduces the herd to an optimal size, but also addresses concerns held by residents. NOAA also encourages the Stewardship Program and DEM to renew efforts to enlist the assistance of the Rhode Island Department of Public Health in addressing the prevalence of tick-borne illnesses on Prudence Island.

V. CONCLUSION

For the reasons stated herein, I find that Rhode Island is adhering to the programmatic requirements of the National Estuarine Research Reserve System in the operation of its approved Narragansett Bay National Estuarine Research Reserve (NBNERR).

These evaluation findings contain ten recommendations. These recommendations are in the form of three Necessary Actions and seven Program Suggestions. The state must address the Necessary Actions by the dates indicated. The Program Suggestions should be addressed before the next regularly scheduled program evaluation, but they are not mandatory at this time. Program Suggestions that must be repeated in subsequent evaluations may be elevated to Necessary Actions. Summary tables of program accomplishments and recommendations are provided in the Executive Summary.

This is a programmatic evaluation of NBNERR that may have implications regarding the state's financial assistance awards. However, it does not make any judgment on or replace any financial audits related to the allowability or allocability of any costs incurred.

_____ _____

Eldon Hout Date
Director

VI. APPENDICES

APPENDIX A. NBNERR'S RESPONSE TO 2000 EVALUATION FINDINGS

#1. PROGRAM SUGGESTION: NOAA encourages DEM to develop a long-term staff and funding plan to support the key reserve positions on a full-time, state-funded (non-grant) basis. DEM also is encouraged to develop a capital improvement/equipment needs and funding plan in order to support the purchase of much needed vehicles and other equipment.

NBNERR replies that it is not possible to create state-funded positions for core reserve staff due to agency employee caps. The only way to add the positions is through cooperative agreements with partners such as the University of Rhode Island and the Audubon Society of Rhode Island. NBNERR states that even if it were possible to create state-funded positions, it would not be advantageous for the reserve because state budgets have been cut each year.

NBNERR purchased two trucks, a tractor with backhoe and mower, road grader and snowplow. The reserve also acquired a research boat and bought a boat trailer.

#2. PROGRAM SUGGESTION: DEM and NBNERR should explore avenues that would increase the program visibility of the reserve. Specifically, the reserve should develop informational kiosks on Prudence Island and at other locations. It also could develop a traveling exhibit and a site-specific website. Efforts undertaken to enhance program visibility must be documented in all performance reports.

NBNERR placed informational kiosks at the ferry dock, the T-wharf, the entrance to the North End Unit and the entrance to the reserve's main facility at the south end of Prudence Island. The reserve also created a traveling exhibit. NBNERR developed two websites; one for the reserve as a whole and another for NBWCTP. Both sites are linked to DEM's web site.

#3. PROGRAM SUGGESTION: DEM and NBNERR are encouraged to develop a land use plan in cooperation with the Law Enforcement Division to ensure that monitoring and enforcement concerns can be addressed as part of the planning process. They are also encouraged to work with the Rhode Island Coastal Resources Management Council to fully explore the benefits of developing a special area management plan for the area surrounding the reserve.

NBNERR created a land-use and habitat map and a land management plan.

DEM's Division of Enforcement and reserve staff have reduced the amount of illegal camping on Patience Island and at the north end of Prudence Island. Additional enforcement issues such as illegal hunting, fires and off-road vehicular use remain to be addressed.

#4. NECESSARY ACTION: DEM and NBNERR must develop a timeline for development of an acquisition plan that evaluates the nine parcels identified in the revised management plan for possible inclusion in the reserve boundary.

NBNERR prepared the acquisition plan in 2001 and the acquisition of Dyer Island in 2002. The reserve expects to complete the acquisition of the Ballard Property in 2005. NOAA suggested that the acquisition plan be adopted as part of the revised Management Plan.

#5. PROGRAM SUGGESTION: Contingent upon the availability of NOAA funding, DEM and NBNERR must make the site profile a high priority and take steps to complete the document before the next evaluation.

NBNERR did not complete its site profile.

#6. PROGRAM SUGGESTION: DEM and NBNERR are encouraged to explore the possibility of entering into a "Friends Group" arrangement with the Prudence Conservancy, thereby allowing the Conservancy to support the reserve in other ways.

The Prudence Conservancy has functioned, in some ways, as a friends group for NBNERR. Members of the Prudence Conservancy volunteer at the reserve in numerous ways, and the two organizations have co-sponsored educational programs. NBNERR notes that it may be appropriate to consider enlisting another organization as a friends group since there are several major issues on which the Prudence Conservancy does not agree with the reserve. The organizations have different missions.

#7. NECESSARY ACTION: NBNERR and DEM must take steps to improve procedures to ensure that all required performance reports are submitted on time, as required by the terms of Federal financial assistance awards.

The reserve made an effort to meet performance reporting requirements, but it did submit late reports at times throughout the review period.

#8. NECESSARY ACTION: NBNERR and DEM must prepare and submit all future annual reports and work plans as they are due. This must begin with the report due in 1999.

NBNERR replies that the reserve's grant applications are its workplans, since it follows them exactly. The reserve states that the grants' semiannual reports represent NBNERR's annual report.

APPENDIX B. PERSONS AND INSTITUTIONS CONTACTED

Narragansett Bay National Estuarine Research Reserve Representatives

Name	Title	Affiliation
Kim Botelho	Education Coordinator	NBNERR
Roger Greene	Manager	NBNERR
Tom Kutcher	Natural Resources Specialist	NBNERR
Brian McCormack	CTP Specialist	NBNERR
Kenny Raposa	Research Coordinator	NBNERR
Matt Rehor	SWMP Technician/Wildlife Ecologist	NBNERR
Robin Weber	SWMP Data Manager/GIS Specialist	NBNERR

State Agency Representatives

Name	Title	Affiliation
Bob Ballou		DEM
Kurt Blanchard		DEM Division of Enforcement
Russ Chaufty		DEM Division of Planning and Development
David Chopy		DEM Division of Compliance and Inspection
Chris Deacutis		DEM Narragansett Bay National Estuary Program
Mary Kay		DEM
Susan Kiernan	Deputy Chief	DEM Division of Water Resources
Michael Mulhare		DEM Emergency Response Program
Lisa Primiano		DEM Division of Planning and Development
Fred Vincent	Interim Director	DEM
Terry Walsh		DEM Division of Water Resources
Jeff Willis	Assistant Director	Rhode Island Coastal Resources Management Council

Federal Agency Representatives

Name	Title	Affiliation
Cathy Wygand		U.S. EPA Lab, Narragansett

Academic Representatives

Name	Title	Affiliation
Peter August	Director	Coastal Institute
Mark Bertness	Professor	Brown University
Jim Boyd		Coastal Institute
John Bruno	Assistant Professor	University of North Carolina
Barry Costa-Pierce	Director	Rhode Island Sea Grant
Candace Oviatt	Director	URI Marine Ecosystem Research Lab
Chip Young		Coastal Institute

NGO Representatives

Name	Title	Affiliation
Bob Marshall	Chair	Prudence Conservancy
Curt Spaulding	Executive Director	Save The Bay

APPENDIX C. PERSONS ATTENDING THE PUBLIC MEETING

Name	Affiliation
Ed Armington	Resident
M. Armington	Resident
Al Bielitz	
John Botelho	Resident
Richard Brooks	Resident
Nancy Capron	Resident
Ray Farnham	
Hope Fitton	Resident and Prudence Island Conservancy
Tom Gempp	Prudence Island Volunteer Fire Department
Edward Giarrusso	Resident
Rose Giarrusso	Resident
Bill Hebert	
Dan Jenness	Resident
Richard Jenness	Resident
Roberta Jenness	Resident
Rich Kenerson	
Janice Lowe	Resident
Ken Lowe	Resident
Evie Malm	Part-time Resident and Prudence Island Conservancy
John Marmaras	Resident
Bob Marshall	Prudence Island Conservancy
Grace McEntee	Resident and Prudence Island Planning Commission
John Murray	
Dick Patton	
Barbara Pezza	Resident
Vin Pezza	Resident
Walter Semirick	UBRI
Dale Shoemaker	Property Owner
William Silvia, Jr.	Resident
Scott Smith	Resident
Dove Tattersall	
Brian Weber	Resident

APPENDIX D. NOAA'S RESPONSE TO WRITTEN COMMENTS

NOAA received five sets of written comments regarding NBNERR. The comments are summarized below and followed by NOAA's response.

William Beaudry
Prudence Island, Rhode Island

Comment: Mr. Beaudry writes that during the last five years, research at NBNERR has been taking away people's rights. He notes that Prudence Islanders value the water and do not want to lose their rights to the water. Mr. Beaudry writes that the community welcomes research at NBNERR, but that the Research and Monitoring Program does not welcome the community.

NOAA's Response: As noted previously in this document, comments such as those provided by Mr. Beaudry indicate a need to increase effective communication between the reserve and island residents about reserve programs and land management practices. Local understanding of the mission of the reserve and responsibilities as a National Estuarine Research Reserve is essential to managing multiple uses of reserve property. Such comments also indicate a need for meaningful community involvement in the development of a revised management plan.

Joel Maguire
Prudence Island, Rhode Island

Comment: Mr. Maguire writes that people who choose to live on Prudence Island as permanent residents highly value their independence and sense of community. He notes that while community members often have different opinions on particular issues, they all love Prudence Island and the way of life that it offers. Mr. Maguire describes his volunteer work with the reserve and notes that the community appreciates the reserve's programs and research. He discusses a meeting he attended at the reserve regarding deer management. At the meeting, it was announced that the Heritage Property would be opened for an experimental hunting period during the first two weeks in December in an effort to reduce herd size. Mr. Maguire notes that he has serious reservations about the opening of the Heritage Property to hunting given that it: (1) abuts the island's schoolhouse and conservation property; (2) contains a number of hiking trails and historically significant ruins; and (3) is one of the few areas people can walk in safety during hunting season. Furthermore, Mr. Maguire registers his concern with enforcement capability on the island.

NOAA's Response: As previously noted in this document, deer management, hunting programs and enforcement are most appropriately handled by DEM with significant input provided by NBNERR. NOAA strongly encourages the Stewardship Program and DEM to work collaboratively with the residents of Prudence Island to develop an effective deer management program that not only reduces the herd to an optimal size, but also addresses concerns held by residents.

Grace McEntee
Chair, Prudence Island Planning Commission
Prudence Island, Rhode Island

Comment: Ms. McEntee writes that many people on Prudence Island are concerned that reduced mowing of traditional fire breaks on the south end of the island will increase the potential for a destructive summer fire. Ms. McEntee spoke with NBNERR's Manager regarding the community's concerns and was told that the fire breaks will be mowed when the growing season is over. Ms. McEntee reported on her conversation at a meeting of the Prudence Island Planning Commission. Many Commissioners and community members were skeptical that the mowing would actually occur and requested Ms. McEntee to write to the Portsmouth Town Council regarding these concerns in the event that action might be required in the future. The community also expressed concerns about logs placed across traditional fire breaks to prevent vehicle access and the lack of street signs on reserve property on the south end of the island. Ms. McEntee concludes that the community wonders why it does not have a working partnership with the state.

NOAA's Response: During the site visit, the evaluation team was assured that road signs soon would be installed on reserve property at the south end of Prudence Island. The evaluation team also heard a number of reasons regarding the reserve's stewardship mission for blocking the traditional fire trails and minimizing mowing in certain areas. As noted previously in this document, comments such as those provided by Ms. McEntee indicate a need to increase effective communication between the reserve and island residents about reserve programs and land management practices. Local understanding of the mission of the reserve and responsibilities as a National Estuarine Research Reserve is essential to managing multiple uses of reserve property. Such comments also indicate a need for meaningful community involvement in the development of a revised management plan.

Allison Newsome
Prudence Island, Rhode Island

Comment: Ms. Newsome writes to express her appreciation for the support NBNERR has shown the art community on Prudence Island. Ms. Newsome received a grant from the Rhode Island Council of the Arts to teach a ceramic workshop on Prudence Island using the theme, "Land, Water and Sky." NBNERR invited Ms. Newsome's ceramic workshop to display their work at its Learning Center. Ms. Newsome notes that her children have always been well received at the Learning Center and have learned a great deal about the island's ecology from the reserve's enthusiastic staff.

NOAA's Response: Ms. Newsome and NBNERR have a good partnership that links Prudence Island's unique environment with art and education. As noted earlier in this document, NOAA recognizes that the reserve's staff are dedicated and enthusiastic. They have allowed the reserve to expand and to enhance its research, education and stewardship programs.

Prudence Island Volunteer Fire Department
Prudence Island, Rhode Island

Comment: The members of the Prudence Island Fire Department write to express their concern with three issues.

1. Subsequent to a serious car accident at the south end of Prudence Island two years ago, the Fire Department requested that the reserve install street signs on its property. The lack of signs resulted in the loss of critical time as the rescue team has a very difficult time locating the accident.
2. Traditionally maintained fire trails have been blocked with large logs, making it impossible for equipment to pass through when needed.
3. A road on the south end of the island that has been used as a fire lane has become overgrown. It is perceived that fire could now easily jump the lane.

NOAA's Response: During the site visit, the evaluation team was assured that road signs soon would be installed on reserve property at the south end of Prudence Island. The evaluation team also heard a number of reasons regarding the reserve's stewardship mission for blocking the traditional fire trails and minimizing mowing in certain areas. As noted previously in this document, comments such as those provided by the Prudence Island Volunteer Fire Department indicate a need to increase effective communication between the reserve and island residents about reserve programs and land management practices. Local understanding of the mission of the reserve and responsibilities as a National Estuarine Research Reserve is essential to managing multiple uses of reserve property. Such comments also indicate a need for meaningful community involvement in the development of a revised management plan.