U.S. Fish & Wildlife Service

Long Island National Wildlife Refuge Complex

Comprehensive Conservation Plan

September 2006

Cover Photos: *Ruddy turnstone - Long Island, NY*, © Janet C. Zinn
Sandplain gerardia, Don Sias/The Nature Conservancy
School group at Elizabeth A. Morton NWR, Jack Martinez/USFWS
Wertheim NWR, USFWS
(Background) *Elizabeth A. Morton NWR*, USFWS

This blue goose, designed by J.N. "Ding" Darling, has become a symbol of the National Wildlife Refuge System.

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the 96-million acre National Wildlife Refuge system comprised of more than 545 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological services field stations. The agency enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

Comprehensive Conservation Plans provide long term guidance for management decisions and set forth goals, objectives, and strategies needed to accomplish refuge purposes and identify the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

U.S. Fish & Wildlife Service

Long Island National Wildlife Refuge Complex

Comprehensive Conservation Plan

Amagansett, Conscience Point, Elizabeth A. Morton, Oyster Bay, Seatuck, Target Rock and Wertheim National Wildlife Refuges, the Sayville Unit of Wertheim, and Lido Beach Wildlife Management Area

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Summary

Type of action:	Administrative
Location:	Long Island National Wildlife Refuge Complex Suffolk and Nassau Counties, New York
Lead agency:	U.S. Department of the Interior, Fish and Wildlife Service
Responsible official:	Marvin E. Moriarty, Regional Director, Region 5
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This Comprehensive Conservation Plan (CCP) for the Long Island National Wildlife Refuge Complex (complex) is the culmination of a planning effort involving a variety of partners and communities. The CCP establishes 15-year management goals and objectives for wildlife and habitat, public use, and partnerships for the complex. The complex includes the Amagansett, Conscience Point, Elizabeth A. Morton, Oyster Bay, Seatuck, Target Rock, and Wertheim refuges, the Lido Beach Wildlife Management Area and the Sayville Unit of the Wertheim refuge. Staff from the refuge complex headquarters office at Wertheim National Wildlife Refuge in Suffolk County, New York will implement this plan for further protection and management of endangered, threatened, and other plant and animal species of concern, including migratory wildlife. The plan is designed to expand and improve opportunities for wildlife-dependent recreation, and allow the complex to benefit from its proximity to New York City and urban communities.

The complex will increase existing programs to protect habitats and manage for the threatened piping plover, sandplain gerardia (a rare plant), American eel, mud and box turtles, wintering waterfowl, and neotropical migratory songbirds. Efforts would intensify to control non-native invasive species such as phragmites, and the complex would evaluate and implement new management practices to decrease insecticide use in marsh communities. Other highlights of the CCP include 1) constructing a new headquarters and visitor center at Wertheim National Wildlife Refuge that will also serve as an office for Region 5's Long Island Field Office, part of the Division of Ecological Services; 2) strengthening interpretive and environmental education programs throughout the refuges; 3) expanding outreach efforts, such as public relations and volunteer programs; and 4) initiating a regulated early-season (September) hunt and other population control measures to manage over-abundant populations of resident Canada geese at Wertheim National Wildlife Refuge. The Service will actively pursue land acquisition opportunities within the refuges' approved boundaries, as well as other land protection opportunities. However, this CCP does not propose Service acquisition of additional lands at this time.

Vision Statement for the Refuge Complex

The Long Island National Wildlife Refuge Complex will preserve, manage, and restore some of the last significant natural areas for wildlife on Long Island, New York. The Complex will comprise varied and important wildlife habitat, ranging from coastal systems to native grasslands to mature forests. These habitats, present in nine distinct units, will support threatened and endangered species in addition to hundreds of species of migratory birds and other wildlife within the Atlantic Flyway.

Located adjacent to the nation's major media center, the Complex is an ideal setting to increase public awareness, understanding, and support of the National Wildlife Refuge System. We recognize that success is dependent on the Complex becoming an integral part of the community. We will work together with partners and local communities to protect refuge lands and wildlife from increasing pressures and threats. We will provide compatible priority wildlife-dependent recreational and educational opportunities. Through the use of the best scientific information and active habitat management, we will contribute to fulfilling the mission of the National Wildlife Refuge System for future generations.

- Amagansett National Wildlife Refuge
- Elizabeth A. Morton National Wildlife Refuge
- Oyster Bay National Wildlife Refuge
- Seatuck National Wildlife Refuge
- Wertheim National Wildlife Refuge
- Conscience Point National Wildlife Refuge
- Lido Beach Wildlife Management Area
- Sayville Unit of Wertheim
- Target Rock National Wildlife Refuge

Long Island NWR Complex
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September 2006

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Acronyms (inside back cover)

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Black-crowned night heron

Chapter 1

Introduction

- Puropose and Need for Plan
- Project Area
- History of Refuge Establishment, Acquisition, and Management Purposes
- National and Regional Mandates Guiding this Project
- Conservation Plans and Initiatives Guiding this Project
- Existing Refuge Operational Plans
- Vision Statement
- Goals for the Complex

Purpose and Need for Plan

This Comprehensive Conservation Plan (CCP) for the Long Island National Wildlife Refuge Complex (Complex) was prepared pursuant to the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.; Refuge Improvement Act). An Environmental Assessment (EA), required by the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347), was prepared concurrent with the draft CCP.

This final CCP presents the combination of management goals, objectives, and strategies that we believe will best achieve our vision for the Complex; contribute to the National Wildlife Refuge System (Refuge System) mission; achieve refuge purposes; fulfill legal mandates; address key issues; and incorporate sound principles of fish and wildlife management, and serve the American public. The CCP will guide management decisions and actions on the refuge over the next 15 years. It will also be used as a tool to help the state of New York natural resource agencies, our conservation partners, local communities, and the public understand our priorities.

This document has 4 chapters and 11 appendixes. Chapter 1 introduces the plan and sets the stage for chapters 2 through 4. It

- describes the purpose and need for a CCP;
- identifies national, regional, and state plans that influenced this plan;
- highlights the purposes for establishing each refuge in the Complex and their land acquisition histories;
- presents the vision and goals for the Complex.

Chapter 2, “The Planning Process,” describes the planning process we followed, including public and partner involvement, in the course of developing this final plan.

Chapter 3, “Refuge and Resource Descriptions,” describes the existing physical, biological, and human environment.

Chapter 4, “Management Direction and Implementation,” presents the general refuge management actions , and the goals, objectives, and strategies that will guide decision-making and land management. It also outlines our staffing and funding needs to accomplish the management direction.

Developing a CCP is vital for the management of each refuge. This final CCP will provide strategic management direction over the next 15 years, by

- providing a clear statement of desired future conditions for habitat, wildlife, visitor services, and facilities;
- providing refuge neighbors, visitors, and partners with a clear understanding of the reasons for management actions;
- ensuring refuge management reflects the policies and goals of the System and legal mandates;

- ensuring the compatibility of current and future public use;
- providing long-term continuity and direction for refuge management; and
- providing direction for staffing, operations, maintenance, and developing budget requests.

The need to develop a CCP for the Complex is two-fold. First, the Refuge Improvement Act requires that all national wildlife refuges have a CCP in place by 2012 to help fulfill the mission of the System. Second, the Complex lacks a master plan that clearly establishes priorities and ensures consistent, integrated management among its nine units.

Our vision statement and Complex-wide goals, management strategies, and actions will help us effectively manage natural resources and priority, wildlife-dependent recreational uses. Involving the public and conservation partners will help us resolve persistent issues of non-wildlife-dependent public use, access, and management for threatened or endangered species. Those reasons clearly underscore the need for the type of strategic direction a CCP provides.

Project Area

The Complex comprises seven national wildlife refuges, one wildlife management area, and one refuge sub-unit. Figure 1.1 below shows their locations.

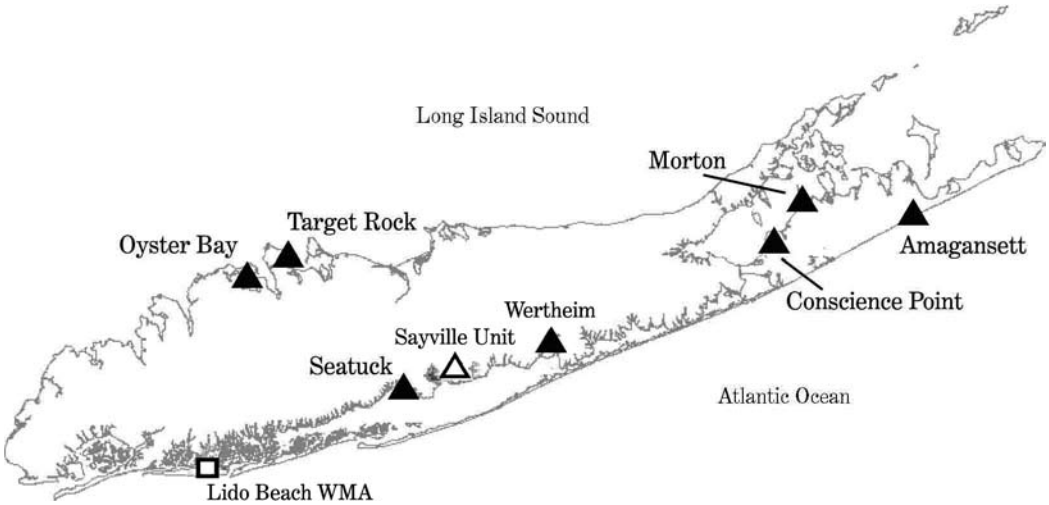


Figure 1.1. The Long Island National Wildlife Refuge Complex

History of Refuge Establishment, Acquisition, and Management Purposes

We acquire refuge lands under a variety of legislative acts and administrative orders. Those authorities for transferring and acquiring land usually stipulate one or more purposes for obtaining it. In accordance with the mission of the National Wildlife Refuge System, these purposes define the basis and standards with which we establish and subsequently manage refuges. The Service acquired most of the refuges in the Complex under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715–715r) "*for use as an inviolate sanctuary, or for any other management purposes, for migratory birds.*" That is the purpose of refuges acquired under this authority, unless otherwise noted. See appendix B for details. Table 1.1 depicts the size of each refuge and the year the Service acquired it.

Amagansett National Wildlife Refuge graces the shore of the Atlantic Ocean on Long Island's south fork in the town of East Hampton. We acquired the 36-acre former lifeboat station in 1968, under authority of the "Transfer of Certain Real Property for Wildlife Conservation Purposes Act" (16 U.S.C. 667b–667d) for "*particular value in carrying out the national migratory bird management program*" by transfer from the U.S. Coast Guard. The refuge is situated adjacent to the town of East Hampton and wildlands owned and managed by The Nature Conservancy.

Table 1.1. Refuge Acquisition Year and Size

Acquired	*Refuge Name*	*Acres*
1947	Wertheim	2,572
1954	Morton	187
1964	Conscience Point	60
1967	Target Rock	80
1968	Amagansett	36
1968	Oyster Bay	3,204
1968	Seatuck	209
1969	Lido Beach	22
1992	Sayville	26

The protection and management of fragile shore habitat and wildlife give Amagansett special significance. A unique double dune system embodies marine sand beach, primary dunes, secondary dunes, swales, fens, bogs, and oak scrub. Some rare plants, including several orchids, occur on the refuge. The area serves as an important migration route for raptors, songbirds, and shorebirds; it also provides wintering grounds for the Ipswich sparrow, a race of the savannah sparrow. Piping plover find suitable habitat and forage here, and have also nested here as recently as 2005, as well as immediately to the west (see chapter 3, map 3-1).

Conscience Point National Wildlife Refuge can be found on the south fork of Long Island in the town of Southampton, bordered by other salt marshes in what is regionally known as the Cow Neck Complex. Low-density housing, agricultural land, and private game land also border this 60-acre refuge. The Service acquired Conscience Point in 1964 by donation from a private individual under the authority of the Migratory Bird Conservation Act.

The maintenance of a maritime grassland community, a habitat of regional significance, distinguishes Conscience Point. Neotropical migratory songbirds find breeding habitat at the refuge, and the wetlands support wintering black ducks and other migratory birds. Its other habitats include grassland, oak-beech forest, shrubland, kettle holes, freshwater marsh, and salt marsh (see chapter 3, map 3-2). The refuge also supports such federal-listed species as bald eagle and sandplain gerardia.

Elizabeth A. Morton National Wildlife Refuge, 187 acres on the north shore of Long Island's south fork in the town of Southampton, came as a gift from Elizabeth A. Morton in 1954 under the authority of the Migratory Bird Conservation Act. The refuge is located near Sag Harbor, and includes a peninsula one and a half

miles long, locally known as Jessup's Neck, which separates Little Peconic Bay from Noyack Bay.

The north–south axis of the peninsula between Long Island's two forks makes the refuge an important migration corridor for migratory shorebirds, raptors, and songbirds. State- and federal-listed threatened or endangered species, like piping plovers and least terns, find nesting and foraging habitat at Morton refuge (see chapter 3, maps 3-3 and 3-4).

Lido Beach Wildlife Management Area, a former Nike missile site, was obtained in 1969 in a transfer of federal property from the Department of the Army, which recognized the area's *"particular value in carrying out the national migratory bird management program."* The property totals 22 acres in Nassau County on the bay side of Hempstead's Lido Beach. The area lies about 20 miles east of New York City and, like the rest of Hempstead Bay, is surrounded by dense residential development. The WMA is bordered by a public bathing beach to the south, a golf course to the west, Hempstead Bay to the north, and the Nike Environmental Education Center to the east.

The tidal wetlands of Lido Beach support wintering populations of black duck and Atlantic brant, and provide important breeding, migrating, and wintering habitat for other waterfowl, colonial nesting wading birds, raptors, and shorebirds (see chapter 3, map 3-5).

Oyster Bay National Wildlife Refuge was donated to the Service by the Town of Oyster Bay in 1968 as a habitat for migratory birds, particularly wintering waterfowl, under the authority of the Migratory Bird Conservation Act. The refuge, totaling 3,204 acres from the bay bottom up to mean high water, is located on the north shore of Long Island. The waters and marshes of Oyster Bay refuge surround Sagamore Hill National Historic Site, home of Theodore Roosevelt, the founder of the first national wildlife refuge in 1903.

Oyster Bay refuge is unique in the System, serving as a marine refuge rather than the more traditional terrestrial refuge; it comprises the waters and marshes of Oyster Bay and Cold Spring harbors. Those marine habitats support a variety of aquatic-dependent wildlife, especially migratory waterfowl of special focus (see chapter 3, maps 3-6 and 3-7).

Sayville, a disjunct sub-unit of Wertheim refuge, was established in 1992 by the transfer of a 26-acre parcel of vacant Federal Aviation Administration land through the General Services Administration under the authority of the Transfer of Certain Real Property for Wildlife Conservation Purposes Act (16 U.S.C. 667b–667d) and the Endangered Species Act (16 U.S.C. 1531–1544, 87 Stat. 884). In 1990, Congress legislated the transfer of an additional 101-acre parcel from the FAA to the Service. That exchange was to be completed after the FAA had removed all buildings and improvements. Those have since been removed, but the FAA's renewed interest in that location has delayed the transfer.

The unit is located in West Sayville, New York, about two miles inland from the Great South Bay. This is the only land-locked unit in the Complex, bordered on the north by an elementary school and small industry; on the east by residential

development; on the south by property of the Board of Cooperative Education Services; and on the west by athletic fields. The 26-acre unit is primarily pitch pine habitat. The 101-acre property currently hosts a viable population of the federal-listed endangered plant sandplain gerardia—the largest population in the state and, possibly, in the Northeast (see chapter 3, map 3-8).

Seatuck National Wildlife Refuge was acquired in 1968 as a donation from the Peters family under the Migratory Bird Conservation Act. The refuge, located in Islip on the south shore of Long Island, consists of 209 acres bordering the Great South Bay, and is separated from the Atlantic Ocean only by Fire Island. The Suffolk County Department of Parks, Recreation, and Conservation owns the property to the west; suburban development lies to the north; Champlin Creek lies to the east; and Great South Bay lies to the south.

With its diverse mix of upland and wetland habitat types, Seatuck hosts more than 200 bird species, and serves as an oasis in a heavily developed urban area. Black ducks are one of the most common species of wintering waterfowl, and hundreds of migrating sandpipers forage in the salt pannes in the fall. Seatuck is being studied as a potential transplant site for sandplain gerardia (see chapter 3, maps 3-9 and 3-10).

Target Rock National Wildlife Refuge was acquired in 1967 under the Migratory Bird Conservation Act as a donation from the Eberstadt family, who maintained the land as a garden estate. The 80-acre refuge is located on the north shore of Long Island in the Village of Lloyd Harbor, 25 miles east of New York City.

Target Rock refuge consists of mature oak-hickory forest, a half-mile of rocky beach, a brackish pond and several vernal ponds. The beach and adjacent waters support black ducks and diving ducks; the uplands provide important habitat for migrating warblers (see chapter 3, map 3-11 and 3-12).

Wertheim National Wildlife Refuge, the headquarters of the Complex, comprises 2,572 acres on the south shore of Long Island in Shirley, New York (see chapter 3, map 3-13 through 3-15). The Service acquired it in 1947 under the authorities of the Migratory Bird Conservation Act and the Refuge Recreation Act (16 U.S.C. 460k-460k-4), as a donation from Cecile and Maurice Wertheim, who maintained the area as a private waterfowl hunting reserve. In addition to the refuge purpose in the Migratory Bird Conservation Act, the Refuge Recreation Act specifies the authorized purposes of "*(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, and (3) the conservation of endangered species or threatened species.*" An additional parcel was donated in 1974, and the Service has spent more than $6 million in acquiring other tracts.

All of the refuges in the Complex are managed from Wertheim refuge. The largest contiguous wetland on Long Island, Wertheim supports wintering and nesting waterfowl and breeding Neotropical migrants, and protects the Carmans River Estuary. The Carmans River, which winds through the refuge, is a New York State-designated scenic river and a state-designated recreational river under its Wild Scenic and Recreational River Act. See appendix B for details.

National and Regional Mandates Guiding this Project

This section highlights Service policy, legal mandates and resource plans, arranged from the national to the local level, that directly influenced the development of this CCP.

The U.S. Fish and Wildlife Service and its Mission

National wildlife refuges are managed by the USFWS, part of the Department of Interior. The Service mission is

> *"...working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."*

The Service has specific federal trust responsibilities for migratory birds, threatened or endangered species, anadromous fish, and certain marine mammals, as well as for lands and waters administered by the Service for the management and protection of those resources. It also enforces federal wildlife laws and international treaties on importing and exporting wildlife, assists with state fish and wildlife programs, and helps other countries develop conservation programs.

The National Wildlife Refuge System, its Mission, and Policies

The Refuge System is the world's largest collection of lands and waters set aside specifically for conserving wildlife and protecting ecosystems. More than 545 national wildlife refuges, in every state and a number of U.S. Territories, protect more than 95 million acres. More than 40 million visitors annually hunt, fish, observe and photograph wildlife, or partake of environmental education and interpretation on refuges.

The passage of the National Wildlife Refuge System Improvement Act of 1997 established a unifying mission for the System, a new process for determining compatible public use on refuges, and the requirement to prepare a comprehensive conservation plan for each refuge in the System. The Refuge Improvement Act states that, first and foremost, the System must focus on wildlife conservation. It further states that the national mission, coupled with the purpose(s) for which each refuge was established, will provide the principal management direction for each refuge. The mission of the System is

> *"...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats in the United States for the benefit of present and future generations of Americans."*

On public use, the Refuge Improvement Act declares that all existing or proposed public uses must be compatible with each refuge's purpose. It highlights six wildlife-dependent public uses to receive enhanced consideration in CCPs. Those six uses are hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The refuge manager determines the compatibility of an activity by evaluating its potential impact on refuge resources, insuring that the activity supports the System mission, and that the activity does not materially detract from or interfere with the refuge purpose.

The Refuge Improvement Act also ensures that, for the first time, the public is formally involved in decisions on recreation and other public uses on units of America's 95-million-acre System. The legislation requires the Secretary of the Interior to ensure that the mission of the System and the purposes of the individual refuges are carried out. It requires the Secretary to maintain the biological integrity, diversity, and environmental health of the System. The continued growth of the System is to be planned and directed in a way that will contribute to conserving the ecosystems of the United States.

The legislation further stipulates that each comprehensive conservation plan "shall identify and describe

(A) the purposes of each refuge comprising the planning unit–found in this chapter;

(B) the distribution, migration patterns, and abundance of fish, wildlife, and plant populations and related habitats in the planning unit–found in chapter 3;

(C) the archaeological and cultural values of the planning unit–also in chapter 3;

(D) such areas in the planning unit that are suitable for use as administrative sites or visitor facilities–found in chapter 4;

(E) significant problems that may adversely affect the populations and habitats of fish, wildlife, and plants in the planning unit and the actions necessary to correct or mitigate such problems–found in chapters 1, 2, 3, and 4; and

(F) opportunities for compatible wildlife-dependent recreational uses–found in chapter 4."

Compatible wildlife-dependent recreational uses are legitimate and appropriate public uses of the System. The definitions of several key terms follow.

Compatible use: "...a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Refuge Manager, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge."

Wildlife-dependent recreational use: "...a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation."

Sound professional judgment: "...a finding, determination, or decision that is consistent with principles of sound fish and wildlife management and administration, available science and resources, and adherence to the requirements of this Act and other applicable laws."

Fulfilling the Promise

The vision statements and recommendations in the "Fulfilling the Promise" report (USFWS) helped guide our development of the goals, strategies and actions for this CCP. "This report on the National Wildlife Refuge System is the culmination of a year-long process involving teams of Service employees who examined the Refuge System within the framework of Wildlife and Habitat,

People, and Leadership. The report was the focus of the first-ever System Conference held in Keystone, Colorado in October 1998, attended by every refuge manager in the country, other Service employees, and scores of conservation organizations…. The heart of the report is the collection of vision statements and 42 recommendations….”

Other Legal and Policy Mandates

The administration of national wildlife refuges is governed by various international treaties, federal laws, and regulations affecting land and water as well as the conservation and management of fish and wildlife resources. Policies for management options of refuges are further refined by the Secretary of the Interior and guidelines established by the Director of the U.S. Fish and Wildlife Service to conform to key legislation affecting national wildlife refuges.

The Refuge Recreation Act of 1962 requires that any recreational use of refuge lands can be an appropriate incidental or secondary use if it is practicable and consistent with the primary objectives for which a refuge was established, and that those uses not interfere with other previously authorized operations.

The National Wildlife Refuge System Administration Act of 1966 authorizes Secretaries of the Interior to permit uses of a refuge whenever they determine “that such uses are compatible with the major purposes for which such areas were established.”

Although the purpose for their establishment provides the foundation for managing refuges, they must also comply with a variety of other federal laws, Executive Orders, treaties, interstate compacts, and regulations on conserving and protecting natural and cultural resources. Appendix B summarizes some important federal laws governing refuge management, including the Clean Water Act, Clean Air Act, the National Historic Preservation Act (16 U.S.C. 470–470b, 470c–470n), the Archaeological Resources Protection Act (16 U.S.C. 470aa–470ll), and the Endangered Species Act. The draft CCP/EA was written to fulfill compliance with NEPA. The Service Manual and Refuge Manual contain Service policies and guidance on planning and day-to-day refuge management. For additional information, you can access the *Digest of Federal Resource Laws of Interest to the USFWS* at http://laws.gws.vog/lawsdigest/indx.html.

R. Parris/USFWS

Morton Beach at Little Peconic Bay.

Conservation Plans and Initiatives Guiding this Project

North American Waterfowl Management Plan

The NAWMP outlines the strategy among the United States, Canada, and Mexico to restore waterfowl populations by protecting, restoring, and enhancing habitat in 11 U.S. Joint Venture Areas and three other Joint Ventures: Arctic Goose, Black Duck, and Sea Duck. Partnerships among federal, state and provincial governments, tribal nations, local businesses, conservation organizations, and individual citizens protect that habitat. The Complex lies in the Atlantic Coast Joint Venture, which has identified 6 focus areas of both wetlands and adjacent uplands for protection throughout Long Island (ACJV 2002). See figure 1.2.

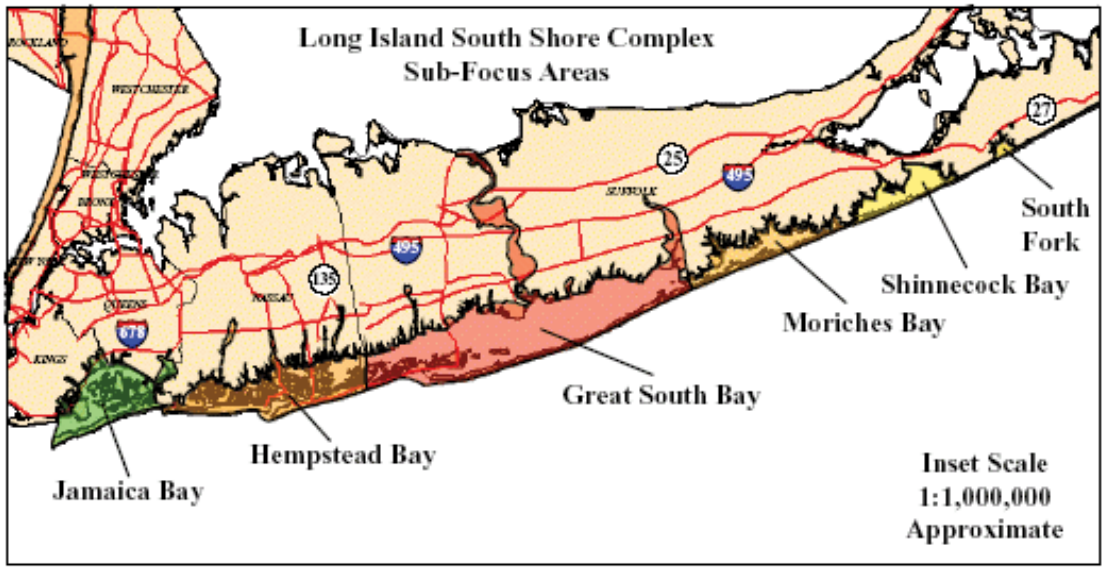


Figure 1.2 Long Island Waterfowl Focus Areas (ACJV 2002)

Because black ducks winter on Long Island, the goals and objectives of the Black Duck Joint Venture would also apply in managing the Complex. The Black Duck Joint Venture has identified coastal salt marsh habitats along the mid-upper Atlantic coast as important wintering habitat. For more information, visit *http://northeast.fws.gov/migratorybirds/ny_waterfowl_web_map.pdf*.

Partners in Flight Landbird Conservation Plan: Physiographic Area 9, Southern New England

In 1990, Partners in Flight was conceived as a voluntary, international coalition of government agencies, conservation organizations, academic institutions, private industry, and other citizens dedicated to reversing the downward trends of declining species and "keeping common birds common." The foundation of PIF's long-term strategy for bird conservation is a series of scientifically based Landbird Conservation Plans. The goal of each PIF Landbird Conservation Plan is to ensure long term maintenance of healthy populations of native landbirds (Partners in Flight 2000).

The plan identifies focal species for each habitat type from which population and habitat objectives and conservation actions will be determined. We utilized this

Table 1.2. Focal Shorebird Species for the Bird Conservation Region

black-bellied plover
semipalmated plover
American oystercatcher
greater yellowlegs
lesser yellowlegs
solitary sandpiper
spotted sandpiper
whimbrel
ruddy turnstone
red knot
sanderling
semipalmated sandpiper
least sandpiper
white-rump sandpiper
dunlin
short-billed dowitcher

draft document for the list of priority species to consider in management. A final plan that will include management recommendations will help direct future landbird management on the Complex.

The Southern New England physiographic area covers parts of northern New Jersey, southern New York including Long Island, the majority of Connecticut, all of Rhode Island, most of eastern Massachusetts, the southeastern corner of New Hampshire, and south-coastal Maine. Urbanization and associated human activities severely threaten remaining high-priority habitats, especially maritime marshes and dunes, relict grasslands, and mature deciduous forests. In addition to many local threats to remaining breeding-bird habitats, this area contains numerous critical stopover sites for landbirds and shorebirds. Table 1.2 lists focal shorebird species in the bird conservation region. The total value of those sites has not been fully assessed yet, and conservation strategies for priority species during stopover lag behind those for breeding species.

New York's Important Bird Areas program has identified 29 key sites on Long Island, and is developing conservation strategies for them. Some specific conservation recommendations for Physiographic Area 9 follow.

- Complete intensive survey and monitoring for high-priority species to identify most important areas in need of protection.
- Identify and designate Bird Conservation Areas, in which long-term sustainability of priority bird populations is a primary management objective.
- Protect and restore coastal wetland habitats to enhance breeding and wintering populations of American black duck and ensure long-term sustainability of marsh sparrow populations.
- Protect and manage remaining mature forests to maximize benefits to cerulean warbler; e.g., preserve tallest trees, encourage maturing of canopy species, prevent fragmentation of existing forests.
- Identify critical sites for migration stopover; integrate habitat objectives into local land-use planning and outreach efforts (Partners in Flight 2000).

U.S. Shorebird Conservation Plan: Northern Atlantic Regional Shorebird Plan

Species of highest priority in this region include piping plover, American oystercatcher, red knot, whimbrel, American woodcock, and Eskimo curlew. Populations are known with some confidence for two high-priority species: breeding piping plovers and migrating red knots. Piping plovers nesting in the region numbered 1,135 pairs in 1997, or most (81 percent) of the Atlantic Coast population. An estimated 80 percent and possibly more of the New World populations of red knots and whimbrels migrate through the region each spring, making this Northern Atlantic region crucial in their survival (U.S. Shorebird Conservation Plan 2000).

Northeast Coastal Areas Study

Completed in August 1991, this 250-page study identified 40 major coastal habitat complexes in need of protection in southern New England and Long Island. The study assessed the status of the region's living resources, and develops strategies to protect, conserve, and enhance the resources and their habitat complexes. Table 1.3 provides details of major habitat types in New York. Those habitat complexes extend from Cape Cod to Staten Island, and include Long Island Sound and the tidal reaches of the Connecticut River. The study identifies 153 federal trust species and 15 significant types of coastal habitat. Trust species are federal-listed endangered or threatened species and candidate species, migratory birds, anadromous fish, and marine mammals. The study also emphasizes the need to promote and develop partnerships and cooperative agreements among all landowners, public and private, to most effectively and efficiently manage larger habitat complexes and their protection. This report has been used to set priorities for acquisition through the System and partnerships (USFWS 1991).

Table 1.3. Estimated acreage, percent of public ownership, and condition of major habitat types in New York.

Habitat type	*Acres*	*Ownership**	*Condition***
Beach Front (high/low energy, sandflats, rocky beach)	37,200	20	1,2,3
Intertidal non-vegetated (mudflats, mud banks)	800,000	70	
Intertidal vegetated (salt marshes)	25,100	70	4
Managed wetlands (impoundments, dredge)	600	100	
Inland habitats (airports, pastures)	10,000	0	2

* Ownership: Estimated percent in public or conservation ownership

** Known Condition Issues: (1) Development threats (2) Human disturbance/Alternate management (3) Degraded, polluted, etc. (4) Exotic vegetation

Significant Habitats and Habitat Complexes of the New York Bight Watershed

Completed in 1996, this 1,025-page document focuses on the regional geographic distribution and population status of more than 1,000 key marine, coastal and terrestrial species inhabiting the New York Bight watershed. The New York Bight includes the Atlantic coastlines of Long Island and New Jersey out to the continental shelf. The geographic scope of the study comprises the marine waters of the New York Bight, the New York-New Jersey Harbor Estuary, and the entire watershed of the Bight and Harbor, including the Hudson River up to the Troy Dam (USFWS 1996b).

The study assesses threats to the integrity of habitats and the species dependent on them, and identifies those habitats and species requiring both immediate and long-term protection, conservation, enhancement, or restoration. That information is being used to emphasize those sites to federal, state, regional, and local planners, resource managers, conservation commissions, regulatory authorities, and the many private conservation organizations throughout the region who, in turn,

further analyze specific habitat areas where species are found in order to protect, conserve, and manage them (USFWS 1996b).

Ecosystem Conservation

During the last decade, we have emphasized ecosystem conservation, particularly the role of refuges in ecosystems, and their ability to affect the long-term conservation of natural resources. Typically using large river watersheds to define ecosystems, teams develop goals and priorities for research and management.

Long Island is split by the boundaries of the Hudson River/New York Bight ecosystem, and the Connecticut River/Long Island Sound Ecosystem. The latter covers the north shore of Long Island including Oyster Bay and Target Rock refuges.

Long Island Sound Study

Long Island Sound belongs to a system of 28 estuaries included in the National Estuary Program under section 320 of the Clean Water Act. The LISS is a cooperative effort involving researchers, regulators, user groups and other concerned organizations and individuals. The study describes ongoing programs and lists commitments and recommendations for actions that specifically address the Sound's priority problems. Approved in September 1994, the Comprehensive Conservation and Management Plan for Long Island Sound is a product of the LISS. That plan calls for a sustained, cooperative effort among the states of Connecticut and New York, the Environmental Protection Agency and other federal agencies, local governments, and the private sector (LISS 2001).

Migratory Bird Program Strategic Plan

The Migratory Bird Program completed a 10-year strategic plan in January 2004. Refuges provide high quality habitat for many migratory birds. The MBP seeks to conserve and manage migratory bird populations and their habitats. Two strategies to achieve those goals are bird population monitoring and habitat management. Refuges are currently conducting biological surveys and managing habitat. The program recognizes the opportunity for using standardized monitoring protocols and habitat assessments on refuges, contributing to region-wide assessments of population trends and effects of habitat management on migratory birds (USFWS 2004).

North American Bird Conservation Initiative

The NABCI brings together the Partners in Flight, shorebird, waterbird, and waterfowl plans in a coordinated effort to protect and restore all native bird populations and their habitats in North America. All bird conservation partnerships reduce redundancy in the structure, planning and implementation of conservation projects. The initiative uses bird conservation regions to guide landscape-scale, science-based approaches to conserving birds and their habitats.

The New England/Mid-Atlantic Coast BCR has the densest human population of any region in the country. Much of the land formerly cleared for agriculture is now

either forest or in residential use. The highest priority birds are in coastal wetland and beach habitats, including the salt marsh sharptailed sparrow and Nelson's sharp-tailed sparrow, seaside sparrow, piping plover, American oystercatcher, American black duck, and black rail. The region includes critical migration sites for red knot, ruddy turnstone, sanderling, semi-palmated sandpiper, and dunlin. Most of the continental population of the endangered roseate tern nests on islands off the southern New England states. Other terns and gulls nest in large numbers, and large mixed colonies of herons, egrets, and ibis may form on islands in the Delaware and Chesapeake Bay regions.

Estuarine complexes and embayments created behind barrier beaches in this BCR are extremely important to wintering and migrating waterfowl, including about 65 percent of the total wintering American black duck population, along with large numbers of greater scaup, tundra swan, gadwall, brant, and canvasback. The exploitation and pollution of Chesapeake Bay and other coastal zones and the accompanying loss of submerged aquatic vegetation have significantly reduced their value to waterfowl (USFWS 2000). Visit *http://www.nabci-us.org/aboutnabci/bcrdescrip.pdf* for more information.

State Comprehensive Wildlife Conservation Plan

In Fall 2001, Congress established a new State Wildlife Grants program that provided funds to state wildlife agencies for the conservation of fish and wildlife and their habitats. Each state was charged with developing a Comprehensive Wildlife Conservation Plan by October 2005. The New York State Department of Environmental Conservation developed a Comprehensive Wildlife Conservation Strategy that addressed the wildlife species in greatest need of conservation in the state. The development and submission of this strategy to the Service establishes New York's eligibility to receive State Wildlife Grant funds, which are apportioned by the Service.

The CWCS utilizes best available data on the status of fish and wildlife species to define a vision and establish a strategy for state wildlife conservation and funding. The objectives and goals defined within the CWCS address the entire diversity of fish and wildlife and their habitats. The CWCS is a collaborative effort among agencies, organizations and individuals with an interest in New York's wildlife. It is Service policy to issue a final conservation plan for each unit, to the extent practicable, consistent with fish and wildlife conservation plans of the state in which the refuge is located.

Sandplain Gerardia (*Agalinas acuta*) Recovery Plan

The recovery plan for the federal-listed endangered sandplain gerardia identifies the most significant factor leading to the decline of the species as the loss or degradation of suitable habitat. Habitat degradation and loss is caused by increased development, vegetative succession, and changing historical disturbance regimes. Furthermore, agricultural development and sand and gravel mining have destroyed large amounts of potential habitat. Several sites in New York, particularly on Long Island, are identified as areas where sandplain gerardia grows. The plan describes the ecology of the species and suggests management

techniques for recovery (USFWS 1989). We used the recovery plan while formulating our objectives for sandplain gerardia.

Piping Plover, Atlantic Coast Population, Revised Recovery Plan

The piping plover is the only federal-listed endangered or threatened species that currently breeds on refuge lands in the Complex. The primary objective of the revised recovery program is to remove the Atlantic coast piping plover population from the List of Endangered and Threatened Wildlife and Plants

- by achieving well-distributed increases in numbers and productivity of breeding pairs, and
- providing for the long-term protection of breeding and wintering plovers and their habitats.

The Recovery Plan incorporates guidelines developed in 1994 by our Ecological Services Division, and includes guidelines for managing recreational activities in piping plover breeding habitat. Although those recommendations are not regulatory, they continue to serve as our best professional advice on complying with the Endangered Species Act (USFWS 1996a).

Roseate Tern Recovery Plan, Northeastern Population (First Update 1998)

This revised roseate tern recovery plan was completed in 1998. The plan summarizes life history, ecology, population status, and known threats to the recovery of this federal-listed endangered species. The following recovery objectives were established:

Primary objective: To increase the Northeast nesting population of roseate terns (U.S. and Canada) to 5,000 breeding pairs. This total should include at least six large colonies with high productivity within the species' current geographic distribution.

Secondary objectives:

- To expand the number of roseate tern breeding colonies to 30 or more sites; and,
- To expand the breeding range to historically occupied areas south of the current range.

Over 50 specific tasks are identified that need to be undertaken to meet recovery objectives. We used this plan as we developed management goals and objectives for roseate terns (USFWS 1998).

Regional Wetlands Concept Plan - Emergency Wetlands Resources Act

In 1986, Congress wrote the Emergency Wetlands Resources Act to promote the conservation of our nation's wetlands. The Act directed the Department of Interior to develop a National Wetlands Priority Conservation Plan identifying the location and types of wetlands that should receive priority for acquisition by federal and state agencies using Land and Water Conservation Fund appropriations. In 1990, our Northeast Region completed a Regional Wetlands Concept Plan identifying a total of 850 wetland sites in the region that warrant consideration for acquisition

due to wetland values. The wetland values, functions, and potential threats for each site were cited; 150 sites in the State of New York were listed. Of those, 53 sites are located in Suffolk County and 3 in Nassau County (USFWS 1990).

Existing Refuge Operational Plans

Part 4, chapter 3 of the Refuge System Manual (1985) lists more than 25 step-down management plans generally required on most refuges. Step-down plans describe specific management actions refuges will follow to achieve objectives or implement management strategies. Some require annual revision, while others are revised on a 5- or 10-year schedule. Some require additional NEPA analysis, public involvement, and compatibility determinations before they can be implemented. Table 1.4 outlines the status of the step-down plans for the Complex.

Table 1.4. Status of step-down plans for the Complex

Plans now up-to-date	*Plans needing revision*	*Plans yet to be written*
Vertebrate Pest Control (Seatuck) Fire Management Hunting (Wertheim)	Public Use*	Land Protection Habitat Management Law Enforcement† Visitor Services‡ Hunting

* Public Use Plan will be updated and replaced by Visitor Services Plan

†to include plans for crowd control and search and rescue

‡to include plans for wildlife-dependent recreation, outreach, education signage, and facilities maintenance

Habitat and Population Management Plans

The Complex is currently developing a Habitat Management Plan (HMP) with other national wildlife refuges in Bird Conservation Region 30. The HMP will provide specific guidance for the implementation of management strategies such as invasive species control and habitat monitoring efforts. Seatuck has a deer population management plan and a draft exists at Wertheim. Both refuges have mosquito management plans. Such plans are vital to the long-term, comprehensive management of these resources.

Resource Protection and Visitor Safety Plan

Some current problems on refuges throughout the Complex include trespassing, illegal construction, vandalism, littering/dumping, dog-walking, and homeless encampments. Thus, we need increased enforcement and outreach for resource management issues associated with public access, public effects, threatened or endangered species protection, deer management, feeding wildlife, and mosquito control.

Visitor Services Plan

Our Public Use Plan is grossly out of date. More and more, the Service is recognizing the importance of visitors to national wildlife refuges. The Improvement Act mandates providing wildlife-dependent recreation opportunities

for the public, as long as those opportunities do not conflict with wildlife or habitat management activities. To that end, a needs assessment and subsequent comprehensive visitor services plan that includes plans for wildlife-dependent recreation, outreach, education, signage, and facilities maintenance is needed to better serve visitors to these public lands.

Vision Statement

Early in the planning process, our team developed a draft vision statement to provide a guiding philosophy and sense of purpose for the CCP. It qualitatively described the desired future character of the Complex through 2015 and beyond. It has been refined throughout the planning process with input from our partners and the public. It will guide program emphases and priorities at the Complex.

> *The Long Island National Wildlife Refuge Complex will preserve, manage, and restore some of the last significant natural areas for wildlife on Long Island, New York. The Complex will comprise varied and important wildlife habitat, ranging from coastal systems to native grasslands to mature forests. These habitats, present in nine distinct units, will support threatened and endangered species in addition to hundreds of species of migratory birds and other wildlife within the Atlantic Flyway.*
>
> *Located adjacent to the nation's major media center, the Complex is an ideal setting to increase public awareness, understanding, and support of the National Wildlife Refuge System. We recognize that success is dependent on the Complex becoming an integral part of the community. We will work together with partners and local communities to protect refuge lands and wildlife from increasing pressures and threats. We will provide compatible priority wildlife-dependent recreational and educational opportunities. Through the use of the best scientific information and active habitat management, we will contribute to fulfilling the mission of the National Wildlife Refuge System for future generations.*

Goals for the Complex

Our planning team developed the following goals for the Complex after reviewing applicable laws and policies, regional plans, the vision statement, the purpose of each refuge, and public comments. All of the goals fully comply with and support national and regional mandates and policy.

In order to provide protection and achieve viable population levels for endangered species and migratory birds and fish, the following four habitat goals have been proposed. They will help protect, restore and enhance the native habitats necessary and maximize their use by endangered species and migratory birds and fish:

Goal 1 Improve the biological diversity and integrity of upland cover types to sustain high quality habitat for migratory passerine birds.

Goal 2 Restore the biological health of aquatic habitats to high quality conditions on the Complex salt marshes, bays, tidal tributaries, and impoundments to benefit waterfowl and shorebirds dependent on these systems, while also supporting other native, wetland-dependent species.

Goal 3 Restore and increase the biological diversity and integrity of native grasslands to foster endangered plant recovery and the communities upon which they depend.

Goal 4 Enhance the functionality of coastal strand habitats as they relate to beach-nesting colonial water birds and shorebirds to meet optimal population levels.

To increase community support by raising public and partner awareness and understanding of the Complex and its wildlife and habitat conservation is important. To enhance visitor opportunities for wildlife-dependent recreation that do not conflict with resource protection or management programs, and to apply partnerships in the areas of resource conservation and public use, we propose the following two goals:

Goal 5 Provide priority wildlife-dependent recreational and educational opportunities when compatible with the resource and available funding.

Goal 6 Communicate and collaborate with local communities and partners throughout Long Island to promote the National Wildlife Refuge System and the Complex.

© Janet C. Zinn

Snow geese

Chapter 2

The Planning Process

- The Comprehensive Conservation Planning Process
- Issues, Concerns, and Opportunities
- Wilderness Review
- Issues Outside the Scope of this Planning Process

The Comprehensive Conservation Planning Process

Service policy establishes an eight-step planning process that also facilitates compliance with NEPA (602 FW 3), as illustrated in figure 2.1. Each step is described in detail in the planning plicy and CCP training materials. While the figure suggests these steps are discreet, there can be 2-3 steps happening concurrently. For more details on the planning process, please visit *http://policy.fws.gov/602fw3.html*.

Effective conservation begins with community involvement. We used a variety of public involvement techniques to ensure that our future management of the refuge would reflect the issues, concerns and opportunities expressed by the public.

Figure 2.1. The Comprehensive Conservation Planning process and its relationship to the National Environmental Policy Act of 1969

We held Open Houses and Public Information Meetings throughout Suffolk and Nassau Counties at five different locations in fall 2000, advertised locally through news releases, paid advertisements, and through our mailing list. The Open House sessions were for people to learn informally about the project and have their questions or concerns addressed in a one-on-one setting. The evening Public Information Meeting sessions usually included a slideshow presentation about the refuge, a brief review of the System and our planning process, and a question-

and-answer session. We encouraged all participants to express their opinions and suggestions. Those public meetings allowed us to gather information and ideas from local residents, adjacent landowners, and various organizations and agencies.

We developed an Issues Workbook to encourage written comments on such topics as wildlife habitats, exotic nuisance species, and public access to refuge lands, and mailed it to a diverse group of more than 1,500 people on our mailing list, gave it to people who attended a public meeting, and distributed it to anyone who requested one. More than 100 people returned completed workbooks.

In June 2006, we completed Step E: "Prepare Draft Plan and NEPA Document" and released a draft CCP/EA for a 30-day public review and comment. In addition, we held three public meetings/open houses June 26-June 28, 2006. We summarize those public meetings, the public comments we received, and our responses to comments in appendix J In some cases, our response resulted in a modification to alternative B, our preferred alternative. Our modifications included additions, corrections, or clarifications which we have incorporated into this final CCP.

M. Lin/USFWS

We held a series of three public meetings and open houses on June 26-June 28, 2006.

Our Regional Director has signed a Finding of No Significant Impact (FONSI) which certifies that this final CCP has met agency compliance requirements and will achieve refuge purposes and help fulfill the Refuge System mission (appendix K). It also documents his determination that implementing this CCP will not have a significant impact on the human environment, and therefore, an Environmental Impact Statement (EIS) is not required.

The CCP must be formally revised every 15 years, but earlier if it is determined that conditions affecting the refuge have changed significantly. We will periodically monitor the plan to ensure that its strategies and decisions are being accomplished. We will use that data collected in routine inspections or programmatic evaluations to continually update and adjust management activities.

These documents will be made available to all interested parties. Implementation can begin immediately.

Issues, Concerns, and Opportunities

Public and partner meetings and further team discussions produced the key issues briefly described below. In chapter 4, we present the general refuge management actions, and the goals, objectives, and strategies that we designed to address these issues.

Managing Threatened or Endangered Species and Other Species and Habitats of Special Concern

Protecting federal-listed endangered or threatened species is integral in the fundamental mission of the System. Other federal trust species of primary concern include migratory birds, anadromous fish, and certain marine mammals. As part of the CCP process we initiated intra-service consultation with our Ecological Service's program to evaluate potential impacts of our proposed management to threatened or endangered species. We completed the intra-service section 7 biological evaluation form and included it as appendix H.

R. Parris/USFWS

Piping plover eggs

Controlling Invasive Species

Invasive upland plants are a relatively recent concern at the Complex. Limited control began in 2002. Invasive plants are a threat because they displace native plant and animal species, degrade wetlands and other natural communities, and reduce natural diversity and wildlife habitat values by out-competing native species for light, water, and nutrients.

Because staff at the Complex are so familiar with its refuges, they have a solid sense of the invasive species present, although they have not mapped their locations. Invasive plants are distributed extensively over each of the refuges, and threaten both aquatic and terrestrial systems. *Phragmites* (*Phragmites australis*), or common reed, dominates virtually all of the more than 300 acres of brackish marsh community at Wertheim refuge, and upland species such as Asiatic bittersweet, an invasive vine, are overtaking grasslands and are beginning

to strangle trees in forested areas. Other invasive plants found at the Complex include multiflora rose, Russian olive, and Japanese wisteria.

Once invasive plants have become established, their characteristic abilities to establish easily, reproduce prolifically, and disperse readily make getting rid of them expensive and labor-intensive. Many of them cause measurable economic impacts, particularly in agricultural fields. Preventing new invasions is extremely important for maintaining biodiversity and native plant populations. Controlling affected areas will require extensive partnerships with adjacent landowners and state and local government agencies.

Invasive species that may pose a threat to refuge resources in the future include the cabomba (Carolina sandwort), perennial pepperweed, water chestnut, Asian long-horned beetle, and northern snakehead.

Managing Overabundant Wildlife Populations

Overabundant species, both native and non-native, may degrade habitat quality or the overall integrity of an ecological community. Native species become overabundant when their populations exceed the range of natural fluctuation and the ability of the habitat to support them. Overabundant species like red fox and raccoon may also displace or prey upon species that are being restored like the piping plover.

The non-native mute swan inhabits the Carmans River down to the mouth of the Great South Bay year-round. Mute swans feed on submerged aquatic vegetation (SAV). While foraging, each bird consumes an average of eight pounds of SAV per day, including leaves, stems, roots, stolons, and rhizomes (DNR Statewide Management Plan, State of Maryland April, 2003).

Mute swans consume large amounts of SAV that might otherwise be available to native waterfowl. This competition for space and food imposed by mute swans reduces the carrying capacity of breeding, staging, and wintering habitats for native species of migratory waterfowl in the Carmans River where mute swans are established.

Resident Canada geese are well adapted to suburban environments and their populations have generally increased throughout New York. Resident Canada goose populations are high enough to have negatively impacted plantings at wetland restoration sites on, and adjacent to the refuge lands. They are also an important game animal, and can provide recreational opportunities for New York hunters.

White-tailed deer, a native and overabundant species, are particularly a concern. Dense populations of deer consume all palatable vegetation within reach, leaving “browse lines.” Adjacent landowners complain about deer impacts on landscaping, the increase in vehicle-deer collisions, and the threat of Lyme disease from deer ticks.

Controlling Mosquitoes

The use of chemical compounds to control mosquitoes is a controversial topic among Suffolk County residents. The Complex is working with Suffolk County Vector Control to more rigorously manage mosquito populations. One alternative to chemical control is Open Marsh Water Management (OMWM) on the refuges, which we initiated in winter 2004. OMWM is designed to restore the natural tidal flow in the marshes which reduces available mosquito breeding habitat. Mosquitoes and ticks may pose a health risk to humans, but are also part of the ecological system. Mosquitoes are a particularly important food source for aquatic invertebrates, waterfowl, and fish; and by using OMWM techniques, this food network is supported while reducing the human health risks associated with large numbers of mosquitoes.

Establishing Hunting Opportunities at the Complex

Hunting surfaced in the scoping process as a key issue, one raised by Service personnel, DEC biologists, and individuals both for and against expanding hunting opportunities on the Complex. The Service views managed hunts in areas where there are overabundant populations as an effective tool for regulating them. Furthermore, hunting is a valid wildlife-dependent recreational use as defined by the Refuge Improvement Act. Responses generally agree that the overabundance of deer is a concern in Long Island, reflected in the increased numbers of vehicle-deer collisions, increased complaints about deer browsing on residential landscape plantings, visible impacts on native vegetation, and concern about contracting Lyme disease.

Those opposed to hunting cited concerns over public safety, disturbance and harm to other wildlife species, and the impact on visitors engaged in other public uses. The latter concern arises from the likelihood that significant portions of the refuges, due to their small sizes and configurations, would be closed to other activities during hunting. Some expressed the opinion that the refuges should function as a sanctuary for all native species, and that hunting is inconsistent with that function.

Increased Visibility and Partnership Communications

The Service recognizes the need to improve the support and recognition of the Friends of Wertheim and establish other friends groups. Establishing a new volunteer program, initiating additional partnerships and, if necessary, formalizing existing partnerships will all help achieve the goals of the CCP.

Developing a Refuge Complex Headquarters and Visitor Center

The Complex lacks adequate funding and personnel to provide all of the programs and services desired by the public and to effectively meet the goals for this CCP. The current headquarters does not have enough office space to accommodate even existing staff, and the visitor services area is limited to one rack of literature in the reception area. The alternatives compare different funding and staffing levels based on their proposed management strategies for dealing with the issues.

Many of the respondents in the scoping phase of planning felt strongly that more refuge staff should be present during peak visitation to increase resource protection and improve visitor services. Respondents also felt existing visitor facilities including kiosks and interpretive signs on trails should be improved. Other recommendations to increase visibility include more visitor contact stations, increasing wildlife interpretation and environmental educational opportunities, a better location for a headquarters office, developing a visitor center for the Complex, increasing support for a volunteer program, and increasing community involvement.

Wilderness Review

Service planning policy requires a wilderness review to determine if any lands and waters held in fee title ownership are suitable to be proposed for designation as a Wilderness Area. Some of the eligibility criteria include lands that are 5,000 contiguous acres or at least large enough to make it practical to preserve and use the land in an unimpaired condition, or a roadless island. The planning team determined that none of the nine units met the minimum criteria identified in the Wilderness Act due to their small size and many permanent roads. Therefore, this CCP does not further analyze their suitability for wilderness designation. The results of the wilderness inventory are included in appendix D

Worth noting, just south of Wertheim National Wildlife Refuge lies the "Otis Pike Fire Island High Dune Wilderness," the only federal-designated wilderness area in New York. It is part of Fire Island National Seashore operated by the National Park Service. That wilderness area covers 1,363 acres over a 7-mile stretch along the south shore of Long Island.

Issues Outside the Scope of this Planning Process

This CCP does not consider proposals for new, non-wildlife-dependent public uses. Service policy and the Refuge Improvement Act state that incompatible or non-wildlife-dependent recreation will be eliminated as expeditiously as practicable, with few exceptions. The Refuge Manual (8 RM 9.1; 04/82) specifically mentions the need to phase out non-wildlife-dependent activities such as swimming, sunbathing, surfing, motorized boating, jogging, bicycling, and horseback riding. Following public review and comment, the Service published a final compatibility policy in Federal Register Vol. 65, No. 202, pp. 62484–62496 (603 FW 2) on October 18, 2000. That final rule provides more detail on our process for determining which activities are compatible with a refuge's establishment purpose and management goals.

The Federal Register published on June 26, 2006 a Notice of Availability for a new policy regarding appropriate refuge uses. The purpose of the policy is to establish a procedure for finding when uses other than the six wildlife-dependent recreational uses are appropriate for further consideration to be allowed on a refuge. The new policy also provides procedures for review of existing uses. As the policy was not yet incorporated into the draft CCP/EA and available for public review, we have not included a review of appropriateness in this final CCP. However, future uses will adhere to the new policy, and a finding of appropriateness will be the first step in deciding whether we will allow a proposed use or continue, expand, renew, or extend an existing use on a refuge.

John Mosesso, Jr./NBII

Monarch on kobold spike gayfeather

Chapter 3

Refuge and Resource Descriptions

- Physical Environment
- Biological Environment
- History and Cultural Resources
- Socioeconomic Environment
- Refuge Complex Administration

Physical Environment

Water Quality

All of the refuges but Sayville are associated with some source of water. The three major water bodies that fall under the jurisdiction of the Complex are the Carmans River, Oyster Bay, and the Great South Bay. The Carmans River is the largest undeveloped estuary system remaining on Long Island, and contains habitat vital for shellfish, migratory finfish and waterfowl. A local favorite for fishing and paddling, this 11-mile-long river flows into Bellport Bay in the eastern portion of Great South Bay. Wertheim refuge protects a 3.4-mile stretch of the Carmans River estuary by preserving and protecting its surrounding wetlands that filter pollution. The State of New York has designated that lower section a Wild and Scenic River. Yaphank Creek, also at Wertheim refuge, still has native salters (trout) because of the excellent water quality.

The Suffolk County Department of Health Services and the Suffolk County Community Oversight Committee assessed the river and reported that it has good water quality on the whole (Citizens Campaign for the Environment 2003). Their assessment includes their analysis of stream sediment and surface water samples. Tests were completed for volatile organic chemicals, gross alpha and gross beta indicators of radionuclide contamination, pesticides and heavy metals. Visit *http://www.epa.gov/radiation/radionuclides/* for more information on radionuclide contamination.

However, areas of concern include nitrogen and coliform in the water column and organic compounds in groundwater. Water quality data collected by the SCDHS at the USGS gauging station on the Carmans River at Yaphank indicates total nitrogen concentrations in the range of 1–2 ppm, which is higher than those observed for the Peconic River (Spinello et al. 1993). The mouth of the river is presently closed to shellfishing because of high coliform counts. Inputs from road runoff and waterfowl, including excessive numbers of mute swans, tend to be leading sources of coliform bacteria. Traces of 1,1,1–trichloroethane and other dry-cleaning solvents have also been detected in ground water plumes that feed the Carmans River and its eastern tributaries (SCDHS date unavailable). Thus, despite its protected status, the river represents a significant source of nitrogen and possibly other contaminants in the poorly flushed Bellport Bay (Central Pine Barrens Joint Planning and Policy commission 1996).

The proximity of suburban development increasingly threatens the Carmans River watershed with non-point source pollution, which could lead to degraded fisheries and continue the closure of local shellfish beds. Polluted storm water runoff is the most widespread water quality problem along the southern shore of Long Island (National Oceanic and Atmospheric Administration 2005).

The quality of life in the coastal communities of Oyster Bay and Cold Spring Harbor depends on the health of the bodies of water around them. With that in mind, Friends of the Bay has developed a volunteer water quality monitoring program, in cooperation with the Service, U.S. Environmental Protection Agency, New York State Department of Environmental Conservation, and local governments and volunteer monitoring groups around Long Island Sound. Each week, trained volunteers and environmental scientists monitor various components

of the marine ecosystem. The parameters they track include water temperature, clarity, salinity, dissolved oxygen and, most recently, coliform bacteria.

Although no single test can accurately predict the health of this complex ecosystem, dissolved oxygen is a good indicator of overall water quality. The monitoring by Friends of the Bay indicates that Oyster Bay and Cold Spring Harbor generally are healthy. However, monitoring at all of the sites failed to meet the New York State dissolved oxygen standard at least once in 1999, and Mill Neck Creek, an Oyster Bay tributary, is closed year-round to shell fishing. Visit the Friends of the Bay Web page at *http://www.friendsofthebay.org/programs/waterquality.asp*.

Topography, Geology and Soils

Long Island can be categorized as generally flat, low-elevation terrain. Elevation ranges from sea level to 60 ft. above sea level; the highest points are located on the moraines along east-west axes on the north shore and the mid-section of Long Island. The topography south of the moraines is flat, with a south-facing aspect. The topography north of the moraines is generally flat or rolling, with a north-facing aspect. Slopes are gradual at most Long Island sites, with the exception of the coastal headland habitats that have extreme slopes. Those provide an abrupt edge between terrestrial vegetation, eroded terrestrial bluffs, and strand habitats. The Target Rock, Oyster Bay, and Morton refuges have headland habitats.

The soils of Long Island are less than 12,000 years old, and reflect their glacial parent materials. The soils north of the moraines, i.e., those of Conscience Point, Oyster Bay, Morton, and Target Rock, are medium to coarse textured and moderately well drained. Moraine topography tends to be rolling. An outwash plain south of the moraine, where Lido Beach, Seatuck, Sayville, Wertheim, and Amagansett are located, is coarse textured, excessively drained, infertile, and flat. Sandy loams predominate, but soils range from loams to sands.

Air Quality

Air quality is important, not only for our health, but also for the health of fish and wildlife species and their habitats. The air pollution emitted by power plants, factories, paper mills, vehicles, fires, and other sources can harm those natural resources. Air pollutants can have serious effects on animals, plants, lakes, streams, soils, and visibility across the many acres managed by the Service. Pursuant to the Clean Air Act, as amended in 1977, the Service has an affirmative responsibility to protect air-quality-related values on national wildlife refuges, with special emphasis on Class 1 Wilderness Areas. Those are areas in excess of 5,000 acres that were formally designated as Wilderness before August 1977. However, no Class I areas lie near any portion of refuge lands or waters on Long Island.

The type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions determine air quality at any location in the atmosphere. The EPA designates an area as being in “attainment” for a pollutant if ambient concentrations of that pollutant are below the National Ambient Air Quality Standards (cf. 40 CFR 50), and “non-attainment”

if violations of the NAAQS occur. In areas where insufficient data are available to determine attainment status, designations are listed as unclassified. Unclassified areas are treated as attainment areas for regulatory purposes.

Air quality management in the New Jersey-New York-Connecticut Interstate Air Quality Control Region, which includes Nassau and Suffolk Counties and the entire Complex, is in attainment with NAAQS for five of the six criteria pollutants: sulfur dioxide, nitrogen oxides, particulate matter, lead, and carbon monoxide (NYSDEC 2001). The counties only exceeded the NAAQS for the sixth criteria pollutant, ozone, referenced in 40 CFR 81. Ozone most likely is high as a result of the ultraviolet oxidation of hydrocarbons produced by vehicles.

The nearest significant source of hazardous or criteria pollutants is the New York City area, located approximately 60 miles west of Complex headquarters. Based on the data collected and referenced in 40 CFR 81.333, the area falls within applicable Federal and State ambient air quality standards, with the exception of ozone.

Climate and Weather

The Atlantic Ocean greatly modifies the climate of Long Island, which is categorized as humid continental. Continental influences dominate the climate, and the proximity of the ocean produces a significant maritime influence. Those climatic characteristics result in an extended period of freeze-free temperatures, a reduced range in both diurnal and annual temperature, and heavy precipitation in winter relative to that of summer as compared to other areas in southern New York.

Temperatures are hottest in July and August and coldest in January and February. Daily high temperatures above 90°F occur on average 10 days a summer, and the growing season runs between 200 and 210 days, or from March through September. A temperature at 0°F or lower is recorded one or two days annually. The snow season lasts from late December through early March; snowfall averages 26 inches annually. Precipitation is reduced in June, July, and September; months of high precipitation include March, August, November, and December. Yearly rainfall averages 43.4 inches. Relative humidity varies daily: it ranges from a minimum of 20 percent to a high of 100 percent, with a mean of 60 percent during the 1300 hour period.

A sea breeze is a common local occurrence on most of the coastal refuges. Although winds blow from all directions, winds with a westerly component are most common. Wind speeds tend to be higher in winter and spring than in summer and autumn. The hurricane and tropical storm season extends from August through early October.

Ecological Processes

Historically and ecologically, fire has played the dominant role in shaping the pattern of Long Island's terrestrial vegetation, and it continues to be the major factor influencing that vegetation (Olsvig et al. 1979). Fire is also a necessary ecological process in maintaining Long Island's vegetative communities. Ecologically, the main processes influencing that terrestrial vegetation are wildfire and its suppression, with soil substrate determining the types of plants

that may become established in a given area. A second set of processes that also impact terrestrial vegetative patterns are major storms, forest pests like gypsy moths, and large population densities of white-tailed deer that preclude forest regeneration on a local scale by overbrowsing.

The frequency and severity of fires, which are still common on Long Island, largely determined the pattern of vegetation on the landscape. The warm season grasslands of the Hempstead Plains, oak-brush plains, and dwarf pine plains had the most frequent fires, with return intervals of about 8 years. Fires also occurred with great frequency but not to the same extent in pitch pine, pine-oak, and oak-pine stands, with return intervals ranging from 16 to 26 years. Fires were common in the pine barren vegetation along the south shore, although less common in the forest types north of the moraines on Long Island's north shore. Historically, most of the fires were believed to have resulted from Native American activities in managing land and hunting.

The second major factor influencing the vegetative pattern is soil characteristics: particularly, the amount and type of sand. The most fire-dependent vegetation dominates areas with higher concentrations of sand; the least fire-dependent vegetation dominates areas with less sand. In the colonial period, portions of Long Island were cleared for farming and other agriculture. However, the central pine barren area was not cleared, because of its sandy soils. Native Americans continued their traditional use of fire, and colonists also used fire to clear land. Development since colonial times on Long Island focused on clearing wildlands for agriculture and housing. Fire as a management tool became less common with increasing suburbanization, although wildfires continued to be a conspicuous process in pine barren habitats at Long Island.

R. Parris/USFWS

Prescribed fires mimic the historic fires that shaped the terrestrial vegetation of Long Island.

Many communities on Long Island now suppress wildfires. However, we and other organizations recognize the ecological value of wildfires via prescribed burns. The New York State Forest Rangers apply that technique to state wildlife management lands. The Pine Barrens Commission, a recent multi-agency initiative formed to manage the pine barrens, is now coordinating wildfire suppression efforts and developing a prescribed fire program. The Nature Conservancy keeps a fire boss on Long Island and they have assisted the refuge with prescribed burns on several occasions.

Wertheim is one of the first locales on Long Island to have initiated a prescribed burning program. We maintain two to five qualified burn staff, two trucks outfitted with fire pumps, and a cache of hand tools and associated fire fighting equipment. Although

we do not currently maintain a qualified Burn Boss on staff, our Zone Fire Management Officer in northern New Jersey fills that operational function. We completed our Fire Management Plan in 2001. Depending on other priorities, we participate in the Central Pine Barrens Wildfire Task Force and Prescribed Fire Subcommittee. That has allowed us to collaborate with other land management agencies in the use of prescribed fire and interact with the myriad local fire departments on Long Island responsible for wildfire suppression. Since 2000, we have burned approximately 40 acres of woodland, 11 acres of grassland, and 35 acres of *Phragmites* marsh with prescribed fire. With the exception of a 7-acre grassland burn at Conscience Point and a 2-acre grassland burn at Sayville, all the remaining burns occurred at Wertheim. In addition to burns at refuges, we have participated in a roughly equal number of burns on state, Suffolk County, and TNC properties.

Climate change currently threatens vital coastal marshes, where salt marsh accretion processes may not always keep pace with projected increases in sea level rise. This can lead to marshes becoming too flooded resulting in extensive plant mortality, peat erosion and loss of elevation. If erosion is significant the marsh may be converted to open water or mudflat. In other instances where salt marshes accrete at the same pace as sea level rise but where there are not adjacent low lying upland areas marshes may be "squeezed out" between rising sea levels (loss due to flooding) and an inability of marsh vegetation to "jump" steep elevation grades, particularly those posed by seawalls or other shoreline structures. A recent phenomenon, sudden wetland dieback, also is causing a decrease in salt marsh vegetation. The extent, cause and duration of this problem remain unknown.

In addition to salt marshes, the refuge complex supports other coastal habitats including beach, intertidal mudflats, marine open water, tidal river, maritime shrubland, and upland forests. These habitats provide critical buffers to the marsh as well as critical habitat to many aquatic and upland species of conservation concern.

Biological Environment

Habitat Types

Long Island's vegetation has been categorized into a variety of schemes. According to Bailey (1995), all of the refuges comprising the Complex are located in the eastern broadleaf forest province. Barbour and Billings (1988) place Long Island in their ecological coastal grouping, which includes the northernmost portion of the southeastern coastal plain. The authors specifically refer to the vegetation of Long Island as the "Northern Pine Barrens." On a more local scale, Olsvig et al. (1979) and Villani (1997) have provided a classification scheme of Long Island's terrestrial vegetation types focusing on pine barren types. The Service has placed the refuges of the Complex in two delineated ecosystems: the Hudson River/New York Bight Ecosystem and the Connecticut River/Long Island Sound Ecosystem. The habitat types described below are found on the Complex. Please refer to the vegetation cover maps for each refuge on the following pages and table 3.1 for details.

The following sections describe some of the major terrestrial, wetland, and aquatic habitats associated with the Complex. See table 3.1 for gross cover types of the Complex.

Terrestrial Habitats (based on Reschke 1990)

Conifer plantations can be found at Wertheim and Seatuck refuges. Eastern white pine and Norway spruce dominate. Woody understories and field layers are sparse.

Grasslands are present at six of the nine refuges, and include both warm and cool season species. Warm season grasslands are considered the native grasslands of Long Island, and are dominated by little bluestem, switch grass, Indian grass, broomsedge, and big bluestem. The federal-listed endangered plant sandplain gerardia is associated with certain warm season grasslands. Warm season grasslands are fire-adapted, and occur on refuges in both forest openings and on grasslands greater than 10 acres. Most of the refuges with grasslands contain cool season species, including such non-native grasses as meadow grass, orchard grass, timothy, fescue, and crab grass. Two native cool season grasses that occur in refuges are beach grass, which occurs on primary and secondary dunes, and sweet vernal grass, which occurs on forest edges and as a component of forest meadows.

Improved grounds occur at Wertheim, Seatuck, Morton, and Target Rock, which have public use facilities or structures. Improved grounds tend to lie adjacent to roadways, buildings and parking lots. The grounds are dominated by cool season grasses, principally bluegrass, crab grass, and fescue species. Improved grounds also possess some shade trees and ornamental shrubs. We mow those grounds about every two weeks in the growing season.

Maritime oak forests have a composition similar to oak/beech forests. This type was described by the New York Natural Heritage Program, using the forest stands of Morton as the type example. The stands are located on a narrow peninsula surrounded by bays. The principal difference between this forest type and the preceding type is the greater humidity and wind effects associated with the maritime oak forest.

Mixed-oak forests, the most common forest type on the Complex by acreage, occur only on the southern outwash plain of Long Island, where Wertheim and Seatuck are located. The dominant overstory vegetation includes white oak, red oak, black oak, scarlet oak, and pignut hickory. Pitch pine may be present, but generally consists of less than 10 percent of the overstory. The woody understory is robust, ranges in height from 1 foot to 6 feet, and is dominated by black huckleberry, lowbush blueberry, briar, and highbush blueberry. The field layer is sparse, and the litter layer is robust. In areas of past gypsy moth infestations, where oak mortality has occurred, the stands are open-canopied and the understory is fuller and more robust.

Oak/beech forests grow at Target Rock, Oyster Bay, and Conscience Point. That type is similar to mixed oak, except it grows on sites north of the moraine where the soil consists of less sand, is more fertile, and has increased water-holding capacity. Tree growth and stand quality are more robust than in the mixed-oak stands. Common overstory trees in this type include red oak, black oak, white

oak, American beech, and tulip tree. The woody understory varies from sparse to robust, and includes mountain laurel, maple-leaved viburnum, lowbush blueberry, briar, and black huckleberry. Field layers tend to be sparse.

Oak/pitch pine forests grow at both Wertheim and Seatuck. The overstory vegetation is similar to the mixed oak type, except that the pitch pine component composes between 10 percent and 70 percent of the overstory. The woody understory, field layer, and leaf litter layer are similar to the mixed oak type. The oak-pitch pine type, like the mixed oak type, occurs as both closed canopied and open canopied stands due to past oak mortality by gypsy moth.

Pioneer hardwood forests are typically the first woody vegetation in succession at many of the refuges. Dominant overstory vegetation includes black cherry, sassafras, and black locust. Woody understories are robust and include raspberry/dewberry, briar, black huckleberry, and lowbush blueberry.

Pitch pine forests grow at Wertheim and Sayville, where pitch pine makes up 70 percent of the tree species. Other overstory species include white oak, red oak, and black oak. Woody understory species include black huckleberry, lowbush blueberry, and briar. In a closed canopy stand, the woody understory is sparse, but in an open canopy stand, it is robust. Fuels include the robust leaf litter and the woody understory. Open canopied pitch pine stands present a fire danger because of their high fuel loading and fuel ladders.

Red cedar forests are dominated by red cedar, with few other species in the overstory. This category only includes red cedar past the sapling stage when the canopy is starting to close. The woody understory and field layers are sparse.

Red maple/tupelo forests are dominated by an overstory of red maple and tupelo. A robust woody understory consists of spicebush, arrowwood, and sweet pepperbush. This forest type frequently has a prevalent field layer, frequently including tussock sedge. This forest type grows on moist sites, particularly along stream corridors, although some stands grow at more mesic sites.

Suffolk County Department of Public Works

Dredge site at Seatuck

Unvegetated spoil consists of dredged aquatic sediment placed on either a wetland or terrestrial site. Those materials generally result from the dredging of boat channels. The substrate consists of large particles of sand. Due to the substrate's poor ability to hold nutrients and moisture, vegetation is generally lacking, with the exception of sporadic patches of low-growing false heather. This cover type occurs at Seatuck.

Upland shrub habitats can be found at most of the refuges, and are dominated by arrowwood, Asiatic bittersweet, honeysuckle, scrub oak, dogwood, and other woody species. Upland shrub areas grow along wetland boundaries, forest edges, on impoverished soils, and in areas where high densities of white-

Table 3.1. Gross Cover Types of the Complex

Habitat Types	Percent of Total	Total Acres	Acres Within Each Refuge								
			Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
Unvegetated Habitats; 3496.4 acres (55.1% of land base)											
Open Water	53.7	3405.6		0.2		3.7	2947.7		4.0		450.0
Strand	1.3	85.5	5.5	0.1		37.4	31.0		1.0	7.7	2.8
Unvegetated Spoil	5.3	0.1							5.3		
Herbaceous Habitats; 1200.9 acres (18.8% of land base)											
Grassland	2.3	144.9	26.7	26.0		22.4			30.0	1.3	38.5
Improved Grounds	0.1	9.2				1.9			2.0	1.5	3.8
High Marsh	7.1	452.1		6.0	12.0	5.5	65.0		54.0	0.4	309.2
Intertidal Marsh	3.8	244.0		6.0	7.0	15.0	162.0		12.0	1.0	41.0
Robust Emergent Marsh	5.5	350.7	0.2				0.3		16.0		334.2
Shrub Dominated Habitats; 120.1 acres (1.9% of land base)											
Upland Shrub	1.2	78.1	3.6	2	3.0	28.0		3.0	12.3	3.1	26.1
Shrub Swamp	0.7	42.0					1.0				38.0
Forest Dominated Habitats; 1524.5 acres (24.2% of land base)											
Conifer Plantations	0.1	6.0								5.0	1.0
Maritime Oak	0.6	39.3				39.3					
Mixed Oak	11.5	730.3							35.0		695.3
Oak/Beech	1.2	77.5		15.7			2.0			59.8	
Oak/Pitch Pine	3.3	207.2							4.0		203.2
Pioneer Hardwood	1.1	71.8		4.0		18.7			12.4		36.7
Pitch Pine	2.9	186.8						18.0			168.8
Red Cedar	0.4	24.1				7.5				0.2	16.4
Red Maple/ Tupelo	2.9	181.5				7.5			9.0		165.0

tailed deer cause a lack of forest regeneration. Shrub heights in these habitats range from 4 feet to 12 feet.

Wetland Habitats

High marshes occur at all refuges except Sayville and Amagansett. High marsh is dominated by salt hay, short-growth-form cordgrass, salt grass, black grass, and

salt marsh bulrush. High marsh lies between the intertidal marsh and terrestrial lands. High marsh is flooded by high rainfall, spring tides, or above-normal high tides.

Intertidal marshes likewise are found at all refuges except Sayville and Amagansett. The tide floods the intertidal marsh daily, and the tall-growth form of smooth cordgrass dominates the vegetation.

Robust emergent marshes occur at Wertheim, Amagansett, Oyster Bay, and Seatuck. The vegetation is dominated by invasive *Phragmites*, cattails, brackish cordgrass, or bulrush, at heights ranging from 3 feet to 12 feet.

Shrub swamps can be found at Wertheim and Target Rock. Arrowwood, swamp loosestrife, willow, and alder dominate. Shrub swamps typically lie on the edges of marshes and streams. Fuels include leaf litter, herbaceous material, and the woody overstory. Shrub height ranges from 3 feet to 10 feet.

Aquatic Habitats

The Complex has both tidal and nontidal surface waters. Nontidal waters include ponds, streams, and swamps. Tidal waters include bays, ponds, salt marshes, brackish marshes, freshwater marshes and streams. The tide floods most of the intertidal wetlands daily; the greatest inundation occurs at the new and full moons. The tide also floods the high salt marshes periodically, but at longer intervals than the intertidal marshes. Salt marshes are most prominent at Wertheim, Seatuck, and Lido Beach; subtidal habitats dominate Oyster Bay.

Open water habitats consist of subtidal, tidal, and nontidal waters. The bulk of subtidal and tidal waters occurs at Oyster Bay and Wertheim. That acreage also includes freshwater and brackish ponds at Morton, Conscience Point, Seatuck, and Target Rock. Common vegetative species in those open water areas include eel grass, green fleece, sea lettuce, and waterweed.


© T. Kman
Tidal wetland

Strand or beach habitat occurs at all refuges except Sayville and Lido Beach. This habitat borders tidal waters, and typically consists of coarse, sediment-like sand or small stones. Strand habitat extends from the water's edge to upland vegetation, typically beach grass, on the primary dune. Vegetation both alive and dead is generally lacking in strand habitats.

Fish and Wildlife

The refuges of the Complex provide significant, even critical amounts of habitat for the majority of wildlife species known to occur on Long Island. Nearly 500 vertebrate species and approximately 500 species of vascular plants have been documented at the Complex. Many invertebrate species also live on the Complex, including several species of commercial shellfish. The nine refuges are widely spread, and encompass most of the vegetation types on Long Island, which in-turn provide habitat for a variety of wildlife ranging from forest interior nesting Neotropical migrant birds to marine mammals. The coastal location of the refuges

also makes them part of a major migration corridor for a variety of birds, including waterfowl, waterbirds, raptors, and songbirds. Appendix A lists birds, mammals, reptiles, amphibians, fish, and butterflies that can be found at the Complex.

Birds

Avian species make up the largest single class of vertebrates at the Complex. Close to 300 species have been documented on its refuges. Approximately 70 percent of the waterfowl wintering in New York State spend the months of October through April on Long Island. Up to 25,000 waterfowl have been documented on the waters and wetlands of the Complex. Waterbird use also is common, with peak periods for long-legged wading birds, terns, shorebirds and other waterbirds in the warmer months. The coastal location of the refuges also makes them important migratory habitat for many raptor species, particularly the state-listed endangered peregrine falcon and the state-listed threatened northern harrier. Other raptor species include osprey, hawks, and owls.

Songbirds are conspicuous on the refuges, and a major attraction for many of our visitors. That songbird community is diverse, and includes many Neotropical migrants.

Mammals

Thirty-three species of mammals have been documented at the refuges. White-tailed deer, eastern cottontail, gray squirrel, red fox, eastern chipmunk, muskrat, and harbor seal attract visitors. Bats compose about a quarter of the mammalian species at the Complex.

Reptiles

Thirty-five species of reptiles and amphibians inhabit the Complex. Eastern box turtles and eastern hognose snakes are of particular interest because of their perceived current decline on Long Island, where both species were once considered abundant and dominant. Eastern box turtles are also a species in which our visiting has expressed tremendous interest. The eastern mud turtle, a state-designated endangered species, occupies aquatic habitats at Wertheim.

Amphibians

The dominant amphibians at the Complex include red backed salamander, bullfrog, green frog, wood frog, Fowlers toad and spring peeper. Additional work is needed to survey the salamander community at the Complex, particularly mole salamander species.

Fish

The Complex encompasses diverse aquatic habitats ranging from marine to freshwater and tidal to non-tidal, as well as lentic and lotic habitats. The fish community reflects that diversity. Salt marshes support an interesting array of killifish species. Bays provide seasonal habitat for many recreationally and commercially important marine species. Tidal rivers and streams support both catadromous and anadromous species. Freshwater streams provide trout habitat, and ponds and impoundments support warm water fisheries. More than 100 species of fish inhabit the waters of the Complex.

Invertebrates

Numerous invertebrate species also inhabit the Complex. Although it lacks an exhaustive inventory of the invertebrate communities found at its refuges, appendix B lists butterfly species. Standard works like Boyd (1991), Boyd and Marucci (1979), and Dindal (1979) provide information on invertebrates likely to occur in refuge habitats, particularly in pine barrens and tidal wetlands. Shellfish are found on many of the refuges. Those of particular commercial and recreational interest include oysters, hardshell clams, scallops and blue claw crabs. The waters associated with Oyster Bay are estimated to produce approximately 90 percent of the oysters harvested in New York.

Rare, Threatened or Endangered Species

Federally designated endangered or threatened species at the Complex include the sandplain gerardia, piping plover, roseate tern, bald eagle, and Kemp's ridley, loggerhead, hawksbill, green, and leatherback sea turtles (USFWS 1995). State-listed endangered or threatened animal species at the Complex–not already federal-listed–include the golden eagle, peregrine falcon, black rail and king rail, black, common, and least tern; and short-eared owl, loggerhead shrike, pied-billed grebe, least bittern, northern harrier, upland sandpiper, sedge wren, eastern mud turtle, tiger salamander, northern cricket frog, Hessel's hairstreak, and frosted elfin (USFWS 1995, NYSDEC 2003).

State-listed endangered or threatened plant species at the Complex–not already federal-listed–include little-leaf tick trefoil, round-leaf boneset, coast flatsedge, bushy rockrose, velvety lespedeza, opelousa smartweed, small-flowered pearlwort, seabeach knotweed, swamp cottonwood, rough rush grass, marsh straw sedge, stargrass, slender pinweed, flax-leaf white-top, stiff tick-trefoil, northern blazing star, sandplain wild flax, southern yellow flax, few-flowered nutrush, spring ladies-tresses, swamp sunflower, water pigmy weed, and silver aster.

USFWS

Federal- and state-threatened loggerhead sea turtles depend on subtital habitats.

The state- and federal-listed endangered shortnose sturgeon has been documented in the lower portion of the Hudson River, but no sightings at the refuges of the Complex have been reported.

State threatened plant communities, neither of which are protected, include maritime grasslands and red maple-black gum swamps.

See the table at the end of appendix A for threatened, endangered and species of special concern at the Complex.

Habitat requirements

Sandplain gerardia is part of a fire-dependent grassland community.

Bald eagles principally use the refuges while migrating or wintering, and are associated with aquatic or wetland habitats and their adjacent terrestrial borders. Peregrine falcons also use the refuges while migrating, and forage on the rich waterfowl resource. Short-eared owls require broad expanses of open land with low vegetation, such as grasslands or low-structured open shrub lands, for hunting and nesting (Holt and Leasure 1993). Northern harriers make use of emergent wetlands and grasslands.

The piping plover and roseate tern are associated with intertidal or strand habitats. Common terns nest on sandy beaches, gravelly or sparsely vegetated shores, and both fresh water and salt water high marshes (Burger and Gochfeld 1991, Clapp et al 1983). Least terns prefer areas clear of vegetation. They nest in loose colonies on coastal dunes and on sand or shell beaches just above the high tide line, or along major interior rivers (Hunter 1975, Blodget 1978, Carreker 1985, Thompson et al. 1997).

Black rails are found in high coastal marshes and wet meadows. King rails are found in a variety of freshwater marshes and marsh-shrub swamp habitats. Black terns feed and nest in large, shallow, freshwater emergent wetlands, the margins of lakes, some river edges, and semi-permanent ponds (Dunn and Agro 1995). Pied-billed grebes use "ponds, sloughs and marshes…and occasionally estuarine wetlands" (Gibbs and Melvin 1992); preferring human- and beaver-altered wetlands more than those of glacial origin (Gibbs et al. 1991). Least bitterns use freshwater and brackish marshes with dense, tall growths of aquatic or semi-aquatic vegetation interspersed with clumps of woody vegetation and open water, and occasionally use salt marshes.

Loggerhead shrikes require open country with short vegetation, including riparian areas and open woodlands. Upland sandpipers use large open grasslands, and prefer to nest, feed, and court in short vegetation (Ailes 1976, Kirsch and Higgins 1976), interspersed with taller, concealing grasses (Johnsgard 1981, White 1988, Carter 1992). Sedge wrens use densely vegetated sedge meadows, wet hayfields, the upland margins of ponds and marshes, and coastal brackish marshes (Gibbs and Melvin 1992).

Sea turtles depend on subtidal habitats. Eastern mud turtles hibernate in emergent wetlands and mature pitch pine and oak-pitch pine stands, and nest in warm season grasslands. Adult tiger salamanders inhabit forests, grasslands, or marshy areas (Petranka 1998). Northern cricket frogs use the edges of ponds and streams with submerged or emergent vegetation (Stebbins 1966).

The two lepidopteran species require their host plants to survive. Hessel's hairstreak requires Atlantic white cedar, which grows in swamps and stream banks (Vaughn and Shepherd 2005). The frosted elfin requires wild lupines, and prefers edge habitats near oak savannah and pine barrens with a fairly dense canopy (Packer 1999).

Amagansett National Wildlife Refuge

The current management of Amagansett includes providing habitat for federally listed threatened species such as piping plover; protecting native strand communities, including beach, primary and secondary dunes, and swales; and, emphasizing migratory birds and threatened or endangered species. Other management activities include controlling invasive species such as Japanese black pine and developing nesting structures for raptors (see map 3-1).

Terrestrial Habitats

Amagansett comprises Atlantic coastal barrier beach, primary dune habitats, a secondary dune/swale complex, and scrub oak vegetation. It has a unique double dune system, and is one of the few coastal beaches remaining undeveloped on Long Island. The refuge beach is a typical straight beach formed against gradually rising uplands. The primary dune line averages 10 to 15 feet in height, and is largely intact. Beach grass dominates on these dunes. Species present on the secondary dunes include beach grass and extensive areas of false heather. Behind the foredunes lie areas of poison ivy, beach plum, bayberry, and wild rose. Those areas grade into some small bogs that support cranberry, sedges, and various grasses. The inland portion of the refuge consists of scrub oak, bayberry, beach plum, wild rose, green briar, and red cedar. Approximately 100 acres of The Nature Conservancy holdings border the refuge to the west. East of the refuge lie well-developed private and public bathing beaches.

In the spring and summer, the secondary dunes and the swale complex of the refuge display an impressive array of wildflowers, grasses, and orchids (see table 3.2).

Wetland Habitats

Two palustrine emergent wetlands of approximately 1 acre each lie in the dune/swale terrain. Those contain permanently standing shallow water. The dominant emergents there are common threesquare and rush. Common reed is scattered throughout those wetlands, and cranberry is sometimes found near their shallow fringes (Norton et al. 1984).

Fish and Wildlife

Birds

The coastal location of the refuge enhances its value to birds during migration, although its small size and uniform habitat limits the diversity of bird species to 26. Ipswich sparrows, a race of the Savannah sparrow, are known to winter there. It serves piping plovers and many terns as a foraging area, and piping plovers nest immediately west of it.

Raptors.—The refuge serves an important function for raptors that migrate along the coast. American kestrels, merlins, peregrine falcons, sharp-shinned hawks, and Cooper's hawks have been documented at Amagansett during migration. Up to 100 American kestrels in one hour have been observed at the peak of their autumn

Table 3.2. Vegetation Observed at Amagansett

beach pea	*(Lathyrus maritimus/japonicus)*
blue-eyed grass	*(Sisyrinchium montanum)*
butter and eggs	*(Linaria vulgaris)*
calopogon	(*Calopogon sp.*)
cinquefoil	*(Potentilla sp.)*
common evening primrose	*(Oenothera biennis)*
common highbush blueberry	*(Vaccinium corymbosum)*
deptford pink	*(Dianthus deltoides)*
false heather	*(Hudsonia tomentosa)*
goldenrod	*(Solidago sp.)*
grass pink orchid	*(Calopogon pulchellus)*
horseweed	*(Erigeron canadensis)*
hyssop-leaved thoroughwort	*(Eupatorium rotundifolium)*
indian grass	*(Sorghastrum nutans)*
large cranberry	*(Vaccinium. macrocarpon)*
marsh straw sedge	*(Carex hormathodes)*
mountain sandwort	*(Arenaria groenlandica)*
ox-eye daisy	*(Chrysanthemum leucanthemum)*
path rush	*(Juncus tenuis)*
peppergrass	(*Lepidium sp.*)
poor-man's pepper	*(Lepidium virginicum)*
red fescue	*(Festuca rubra)*
rose	*(Rosa sp.)*
rose pogonia	(*Pogonia ophioglossoides*)
round-leaved thoroughwort	*(Eupatorium hyssopifolium)*
sickle-leaved golden aster	*(Chrysopsis falcata)*
silver rod	*(Solidago bicolor)*
slender fragrant goldenrod	*(Solidago tenuifolia)*
snake mouth orchid	*(Pogonia ophioglossoides)*
tall wormwood	*(Artemisia caudata)*
toadflax	*(Linaria vulgaris)*
wild carrot	*(Daucus carota)*
wild indigo	*(Baptisia tinctoria)*
wood/common strawberry	*(Fragaria vesca)*

passage. Snowy owls and rough-legged hawks have also been documented in the winter.

Waterfowl.—The use of the refuge by waterfowl is limited to adjacent offshore areas. In the winter months, the most common waterfowl species observed include white-winged scoter, surf scoter, oldsquaw, and red-breasted merganser.

Shorebirds, Gulls, Terns and Allied Species.—The marine beach and swales provide habitats for a variety of sandpipers, plovers, gulls, and terns. Black-bellied plovers and sanderlings are the shorebirds most commonly using the beach. Herring gull, great black-backed gull, and ring-billed gull are common year-round at Amagansett, and northern gannets can be frequently observed from the refuge beach in winter.


U.S. Fish & Wildlife Service
Map 3-1
Amagansett National Wildlife Refuge
Suffolk County, New York
Vegetation Cover Map
Refuge Boundary* (36 Acres)
Vegetation Cover
Sand Beach
Northern Beach Heather Dune Shrubland Hudsonia tomentosa Arctostaphylos uva-ursi Dwarf Shrubland
Northern Beachgrass Dune Ammophila breviligulata - Lathyrus japonicus Herbaceous Vegetation
Northern Interdunal Cranberry Swale Vaccinium macrocarpon Morella pensylvanica Dwarf Shrubland
Pitch Pine Dune Woodland Pinus rigida / Hudsonia tomentosa Woodland
Reed-grass Marsh Phragmites australis Tidal Herbaceous Vegetation
Successional Maritime Forest Prunus serotina - Sassafras albidum - Amelanchier canadensis / Smilax rotundifolia Shrubland
*The refuge border stops at the mean high tide line
Produced by Long Island NWR, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006
1:4,061
0 0.1 0.2 Miles
0 0.1 0.2 0.3 Kilometers

Reptiles and Amphibians

Complex staff have observed several eastern hognose snakes at Amagansett. The snake, once an abundant secondary dune species on Long Island beaches, has been steadily declining in numbers. Eastern spadefoot toads also use the refuge.

Rare, Threatened or Endangered Species

The federal-listed endangered roseate tern uses the beach at Amagansett as a resting area, and forages in its offshore waters. Like the roseate tern, the state-listed endangered least tern also uses the beach as a resting area. Piping plovers, a federal-listed threatened species, have also been observed annually foraging and loafing there, and have recently nested on the refuge. New York's Natural Heritage program lists records of the state-listed endangered round-leaf boneset and threatened little-leaf tick-trefoil at Amagansett.

© Richard Kuzminski

Piping plovers are a federal-listed threatened and state-listed endangered species.

Conscience Point National Wildlife Refuge

Conscience Point consists of 60 acres of salt marsh, deciduous forest, shrub habitats, kettle holes, and grassland. About one-third of the refuge is wetland, primarily salt marsh; the other two-thirds are upland habitats (see map 3-2).

Terrestrial Habitats

The refuge preserves and maintains one of the best examples of maritime grassland remaining on Long Island. The grassland is dominated by little bluestem, with lesser amounts of Indian grass, poverty grass, and prickly pear cactus. The tidal wetlands provide habitat important for black ducks and a host of other waterbirds. Management activities are geared toward maintaining native grassland, controlling invasive species, and protecting habitat.

Maritime grasslands are a globally rare plant community found on outwash plains near oceans or bays. Fewer than 100 maritime grasslands are found worldwide (Reschke 1990). Since 1989, the State-listed coast flatsedge and bushy rockrose have been recorded at the refuge. Historically, several other listed plants associated with maritime grasslands were known there. The rarity of the maritime grassland habitat type on Long Island is due partly to the rapidity which the vegetation succeeds into maritime shrubland and the absence of disturbance, e.g. fire, to reduce the spread of woody vegetation.

Wetlands Habitats

Conscience Point is part of a unique wetland network: the Sebonac Creek/West Neck/Scallop Pond System or, in local vernacular, the Cow Neck Complex. That system encompasses about 300 acres of open water, salt marsh, irregularly exposed tidal flats, and aquatic beds (Norton et al. 1984). The Cow Neck Complex includes large, privately owned wetlands and wetlands owned by The Nature Conservancy.

The extensive salt and brackish tidal marshes include a number of tidal creeks, ponds and coves. The marshes characteristically comprise low and high marsh areas dominated by smooth cordgrass and saltmeadow cordgrass, respectively, with various admixtures of glasswort, spikegrass, black grass, and sea lavender, among others. Their upland shrubby edges often are dominated by groundsel-bush, marsh elder and bayberry, grading into upland forest of red maple and white oak.

Fish and Wildlife

More than 150 species of birds and 20 species of mammals have been documented at Conscience Point. The refuge supports only a limited number of breeding bird species, largely due to its small size and minimal forest cover, but bird usage is high among grassland, shrub, forest edge, and salt marsh-dependent species. The refuge salt marsh provides a habitat for a variety of water birds, and provides winter habitat important for black ducks.

U.S. Fish & Wildlife Service

Conscience Point National Wildlife Refuge
Suffolk County, New York

Map 3-2
Vegetation Cover Map

Refuge Boundary (60 Acres)

Water

Grass Path

Vegetation Cover

Black Locust Successional Forest (*Robinia pseudoacacia* Forest)

North Atlantic High Salt Marsh *Spartina patens - Distichlis spicata* - (*Juncus gerardii*) Herbaceous Vegetation

Northeastern Dry Oak - Hickory Forest *Quercus* (*alba, rubra, velutina*) / *Cornus florida / Viburnum acerifolium* Forest

Old-field Red-cedar Forest *Juniperus virginiana* Forest

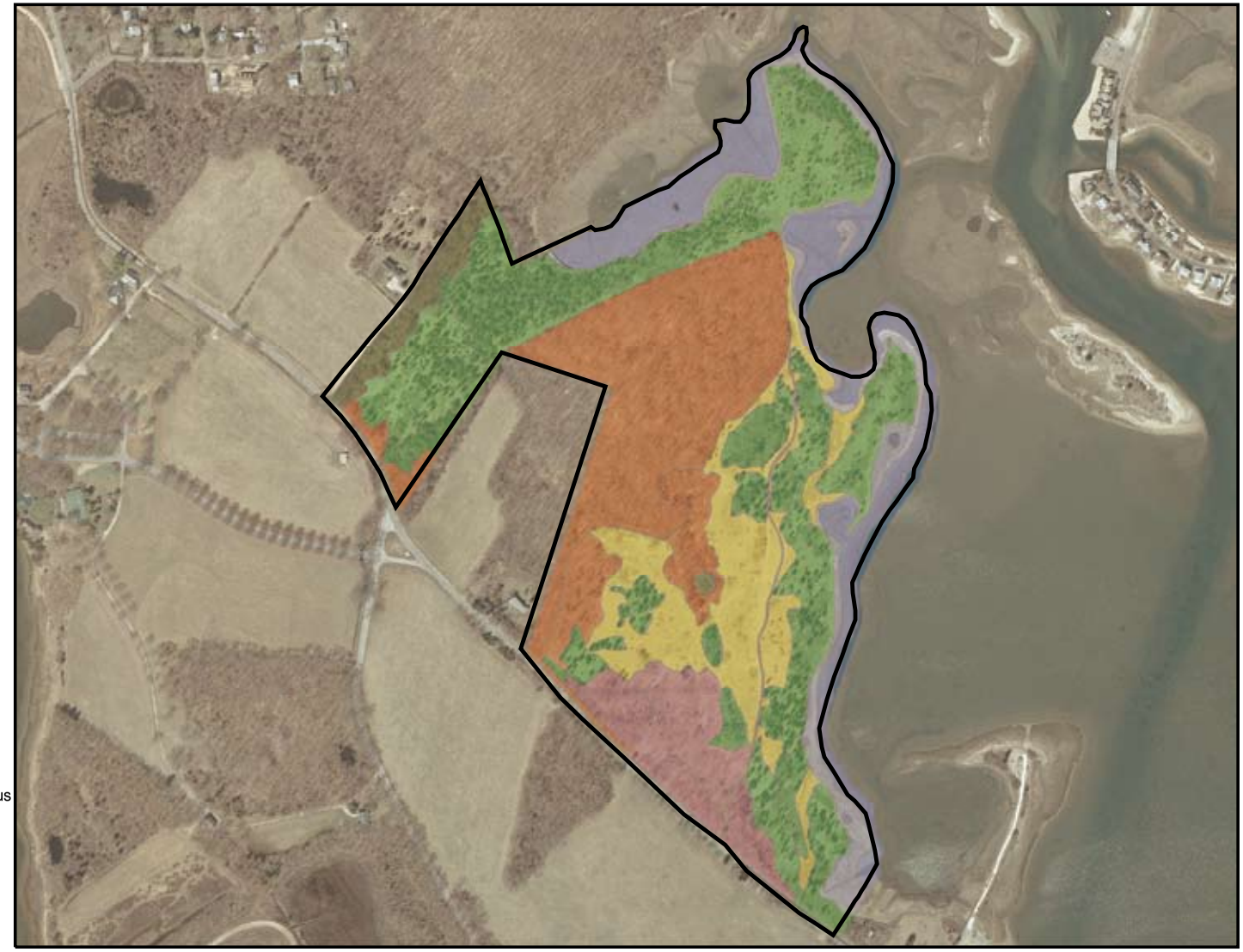
Phragmites Upland Grassland *Phragmites australis* Temperate Upland Herbaceous Vegetation

Reed-grass Marsh *Phragmites australis*Tidal Herbaceous Vegetation

Salt Shrub *Baccharis halimifolia - Iva frutescens / Spartina patens* Shrubland

Sandplain Grassland *Morella pensylvanica / Schizachyrium ittorale - Danthonia spicata* Shrub Herbaceous Vegetation

Successional Maritime Forest Prunus serotina - *Sassafras albidum - Amelanchier canadensis / Smilax rotundifolia* Shrubland



1:6,141

0 0.1 0.2 Miles

0 0.1 0.2 0.3 Kilometers

N W E S

Produced by Long Island NWR, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

Birds

Bobwhite quail and ring-necked pheasants are also observed on Conscience Point, which has one of the highest densities of quail in the Complex.

Raptors.—Osprey and several hawk and owl species also have been observed at Conscience Point.

Waterfowl.—The Cow Neck Complex is known for its high concentration of black ducks. Waterfowl numbers are highest in the colder months, and decline in the warmer months. Black ducks are by far the predominant waterfowl species using the refuge. The area is considered to be regionally significant for black ducks, both as breeding and wintering habitat; wintering black duck densities there are among the highest for Long Island. Because of those factors, the Peconic Estuary Program has tentatively identified the Cow Neck Complex as significant habitat for black duck. Other common waterfowl species include bufflehead, Canada goose, red-breasted merganser, and mallard.

Shorebirds, Gulls, Terns and Allied Species.—In the winter, double-crested cormorants and horned grebe are the waterbird species most commonly encountered on the refuge. Common long-legged waders at the refuge include great egret, snowy egret, and great blue heron.

Gulls and terns are frequently observed at the refuge. Herring and great black-backed gulls are the most common gull species, and least terns are the most abundant terns. Shorebirds commonly encountered include greater and lesser yellowlegs, American woodcocks, short-billed dowitchers, and willets.

Other Migratory Birds.—Neotropical birds are a common component of the wildlife community, especially prairie, yellow, yellowthroat, and blue-winged warblers. Forty species of Neotropical migrants have been documented on the refuge, including a male rose-breasted grosbeak, an uncommon species during the breeding season on Long Island.

Mammals

The most common species in order of abundance are white-tailed deer, gray squirrel, eastern cottontail, and red fox.

Rare, Threatened or Endangered Species

Least and common terns, State-designated endangered and threatened species, respectively, are frequently observed foraging at the refuge aquatic habitats. Their numbers peak in May.

Ospreys, a New York State species of concern, are commonly observed from March through August roosting in trees and foraging in aquatic habitats on the refuge. Several nesting platforms exist on the refuge for breeding ospreys. Northern harriers, a State-listed threatened species, are observed occasionally foraging in the refuge grasslands and marshes.

Elizabeth A. Morton National Wildlife Refuge

Morton National Wildlife Refuge, a 187-acre peninsula and its associated lands and waters, is located in Sag Harbor on the north shore of Long Island's south fork, Southampton Township. The peninsula, known by the local residents as Jessup's Neck, separates Little Peconic Bay from Noyack Bay (see maps 3-3 and 3-4).

Terrestrial Habitats

The position of those bays at Jessup's Neck makes Morton an extremely valuable area for a variety of waterbirds. The north-south axis of the peninsula between Long Island's two forks also makes the refuge an important migration corridor for a variety of terrestrial birds. The peninsula consists of 3 miles of undeveloped shoreline; one of the few shorelines without armoring or development that remain in the area. The tip of the Neck has steep, heavily eroded bluffs approaching 50 feet. Its habitats are varied, and include sand beach, salt marsh, freshwater marsh, brackish and freshwater ponds, lagoons, tidal flats, old fields and oak and cedar forests.

Upland areas at the refuge consist of brush, old fields and forest stands composed of mixed oak, red maple, pioneer and red cedar types. The dominant upland cover type is oak forest, classified by the New York State Heritage Program as a maritime oak forest, a vegetation type represented by only a few areas in the state. Other common upland habitats on the refuge include upland shrubs, which are dominated by honeysuckle and bayberry, grasslands, which are dominated by beach grass, and hardwoods, which are dominated by black cherry.

Refuge beaches are narrow, and consist of either sand or small stones in distinct zones. Shells are extremely abundant. Farther inland, beach grass and seaside goldenrod are abundant.

On the peninsula, the sand and stone beach slopes abruptly upward into heavily eroded sandy bluffs. The deciduous forest atop the peninsula has an open canopy of 30-foot to 40-foot oaks. Shrub growth is extremely dense and mixed, with a composition that includes bayberry, grape, and some sassafras. The more southern of the two patches of forest has trails, whereas the northern patch is nearly impenetrable. Two infrequently flooded brackish ponds lie between them. Floating and submerged algal growth is seldom flushed out and is, therefore, very thick. Shorebirds feed extensively there during fall migration. Ospreys are known to nest in dead cedar trees nearby.

The southern portion of the peninsula contains open water contiguous with Noyack Bay. These sheltered shorelines contain a fringe of smooth cordgrass grading into a high marsh zone of variable width. Several tidal flats also lie in the vicinity, some partially vegetated. Channel dredging for navigation is evident.

The inland portion of the refuge is mostly upland deciduous forest with a variety of other scattered cover types. Several eastern red cedar stands are also present. The main forest has mixed deciduous composition more diverse than typical Long Island oak-dominated woodlands. Many of these vegetation types, especially those adjacent to public-use areas, contain abundant invasive exotic plants such as garlic

mustard, Asiatic bittersweet, Japanese honeysuckle, and Japanese barberry. Pothole-type depressions and small ponds are located on the peninsula and mainland.

Wetland Habitats

The dominant aquatic/wetland cover type at Morton is a beach habitat along the entire Jessup's Neck peninsula. The other two dominant wetland cover types are intertidal marsh and high marsh. Stands of great reed occupy only a small portion of the refuge, and are not considered as great a problem as on other Long Island refuges.

The effects of storms and the buildup of sediment regularly change the refuge shoreline. The apex of the Jessup's Neck peninsula, which consists of a sand and gravel bar, continues to expand toward Long Island's north fork. That bar is a favorite loafing spot for gulls, terns, shorebirds and cormorants.

A freshwater pond, prime habitat for mallards, wood ducks, wading birds, painted turtles and frogs, is located in the upland portion of the refuge. We can manipulate its water levels somewhat with a water control structure.

Fish and Wildlife

Birds

The refuge provides habitat for close to 300 species of birds. The refuge beach and its adjacent waters serve as habitat important for piping plovers, roseate terns, common terns, ospreys, and shorebirds. Sea duck species and American black ducks are common in winter. We direct our management at protecting federally listed beach-nesting species and migratory birds. Marine turtles, seals, and diverse fish species also use those waters.

© Mark Wilson

Black ducks use the lagoon and brackish pond at the refuge.

The most common birds observed on or near the refuge include white-winged scoter, long-tailed duck, common goldeneye, black duck, and gulls. Other bird species of interest, because of a scarcity of

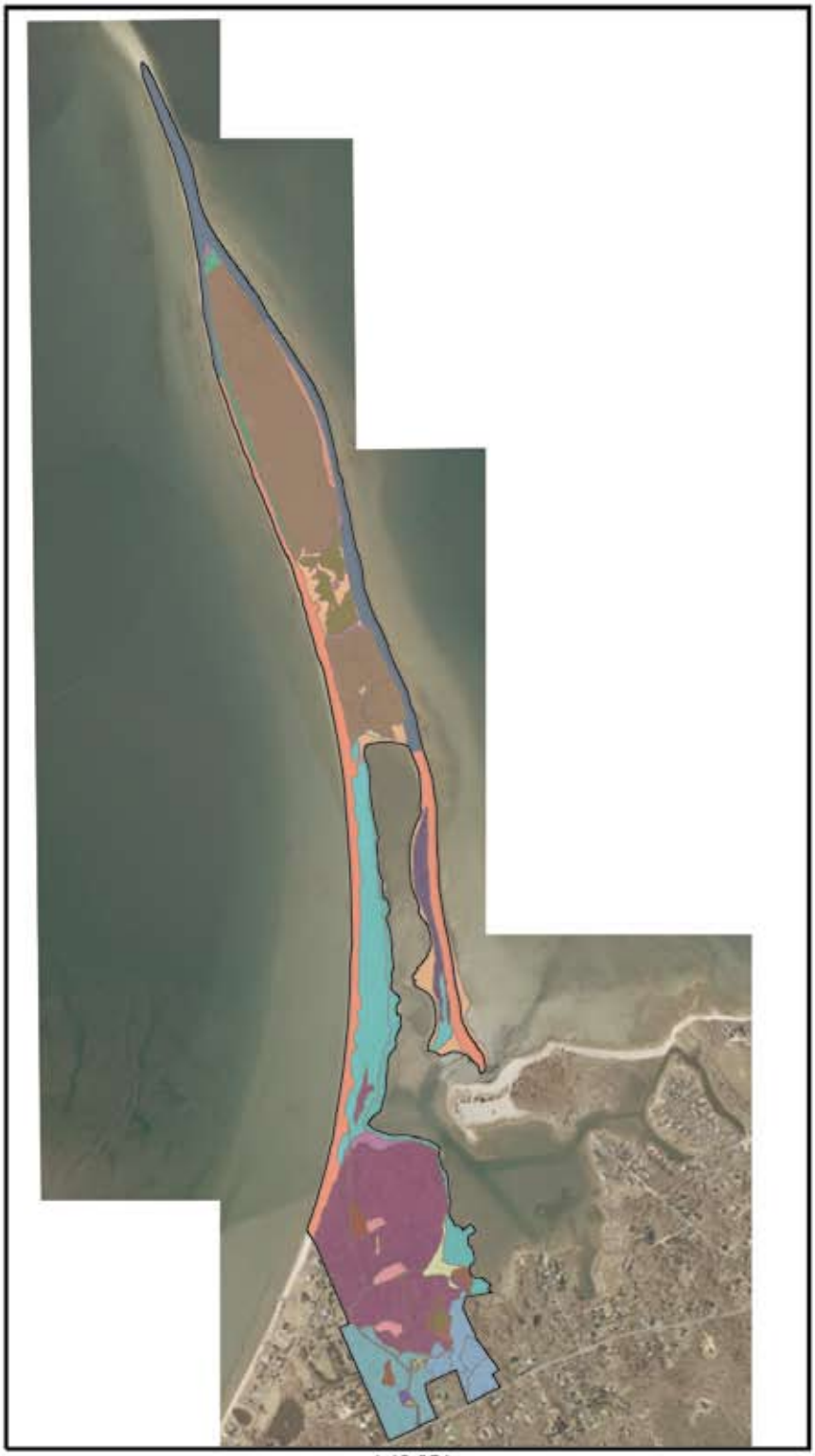
U.S. Fish & Wildlife Service

Map 3-3

Elizabeth A. Morton National Wildlife Refuge

Suffolk County, New York

Vegetation Cover Map



- Refuge Boundary (187 Acres)
- Bridge
- Building
- Driveway
- Parking
- Paved Road
- Rock Beach
- Rocky Slope
- Sand Beach
- Sandy Slope
- Trail
- Unpaved Road
- Water

Vegetation Cover

- Black Locust Successional Forest (*Robinia pseudoacacia* Forest)
- North Atlantic Low Salt Marsh *Spartina alterniflora / (Ascophyllum nodosum) Acadian/Virginian* Zone Herbaceous Vegetation
- Northeastern Dry Oak - Hickory Forest *Quercus (alba, rubra, velutina) / Cornus florida / Viburnum acerifolium* Forest
- Northern Tall Maritime Shrubland *Amelanchier canadensis - Viburnum spp. Morella pensylvanica* Shrubland
- Old-field Red-cedar Forest *Juniperus virginiana* Forest
- North Atlantic High Salt Marsh *Spartina patens - Distichlis spicata - (Juncus gerardii)* Herbaceous Vegetation
- Reed-grass Marsh *Phragmites australis* Tidal Herbaceous Vegetation
- Salt Shrub *Baccharis halimifolia - Iva frutescens / Spartina patens* Shrubland
- Sandplain Grassland *Morella pensylvanica / Schizachyrium littorale - Danthonia spicata* Shrub Herbaceous Vegetation
- Coastal Oak / Heath Forest *Quercus coccinea - Quercus velutina / Sassafras albidum / Vaccinium pallidum* Forest
- Eastern Reed Marsh (*Phragmites australis* Eastern North America Temperate Semi-natural Herbaceous Vegetation
- Lower New England Red Maple Swamp *Acer rubrum - Fraxinus (pennsylvanica, americana) / Lindera benzoin / Symplocarpus foetidus* Forest
- Maritime Red-cedar Woodland *Juniperus virginiana / Morella (=Myrica) pensylvanica* Woodland
- Successional Maritime Forest *Prunus serotina - Sassafras albidum - Amelanchier canadensis / Smilax rotundifolia* Shrubland
- Turf Grass

1:18,951

0 0.5 1 Miles

0 0.5 1 1.5 Kilometers

N W E S

Produced by Long Island NWR, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

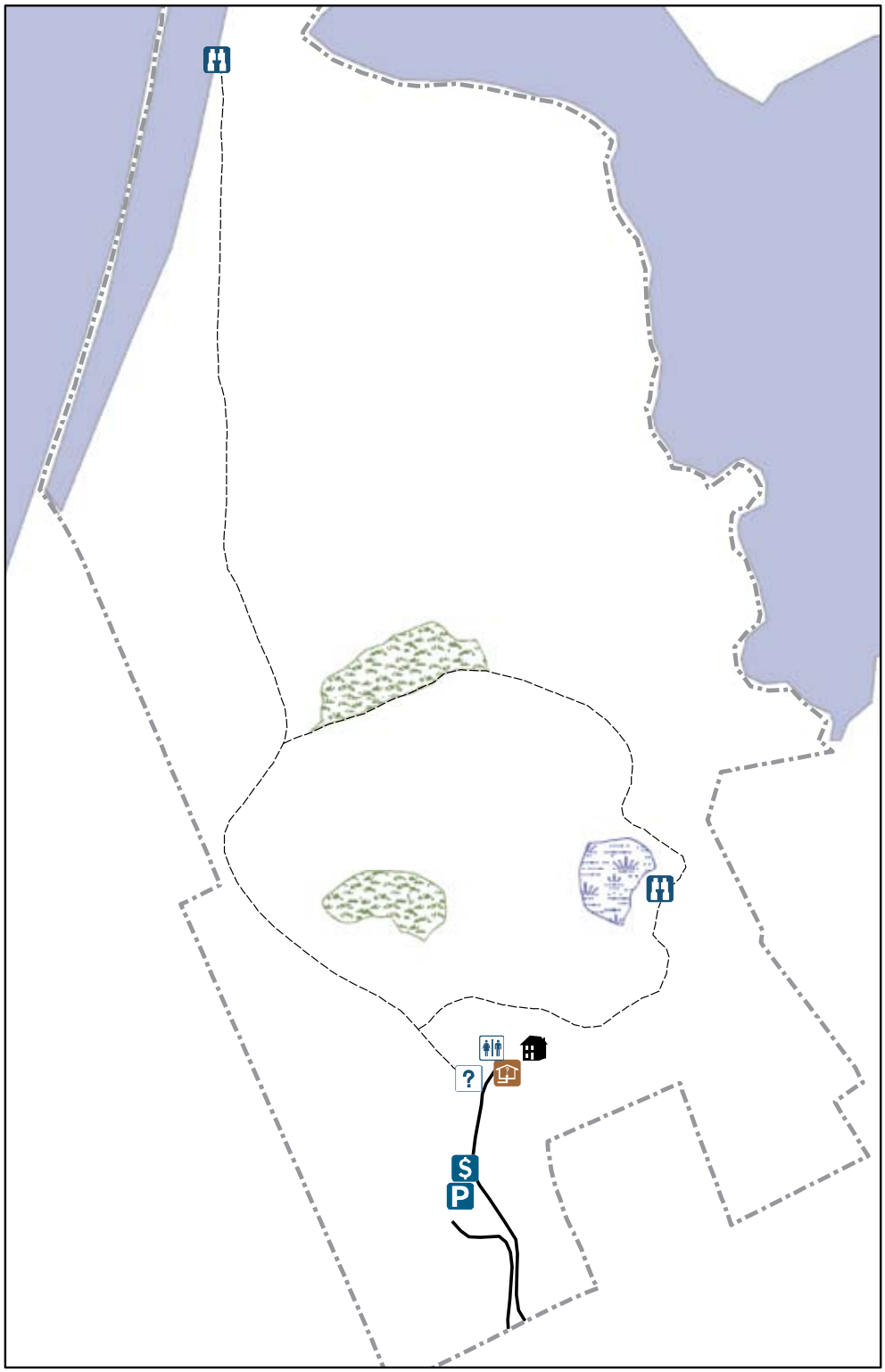
U.S. Fish & Wildlife Service

Map 3-4

Elizabeth A. Morton National Wildlife Refuge

Suffolk County, New York

Facilities and Trails Map



- Fee Station
- Information Kiosk
- Parking Lot
- Platform
- Refuge Housing
- Refuge Office
- Restroom
- Nature Trails
- Access Road
- Refuge Boundary (187 Acres)
- Open Field
- Pond

1:4,200

0 0.1 0.2 Miles

0 0.1 0.2 0.3 Kilometers

Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

sightings in the area, are fox sparrow, sharp-shinned hawk, hermit thrush, horned lark, snow bunting, and swamp sparrow.

Raptors.—Sightings of sharp-shinned hawks, merlins, kestrels, and northern harriers are common at Morton as they move up and down the peninsula. Resident raptor species include great horned owl, red-tailed hawk, and osprey. Screech owls roost in the wood duck nest boxes on the freshwater pond and are easily viewed by the public.

Waterfowl.—The use of Morton and adjoining waters by waterfowl is highest in the winter months. Sea ducks, particularly white-winged scoter and common goldeneye, dominate. The tip of the Jessup's Neck peninsula receives the greatest use. Long-tailed ducks are found somewhat uniformly around the peninsula, and black ducks use the lagoon and brackish pond.

Shorebirds, Gulls, Terns and Allied Species.—Double-crested cormorants are observed year-round at the refuge, but numbers peak in spring and autumn. They feed in the bays adjacent to the refuge and loaf on the Jessup's Neck peninsula and adjacent pilings. Great cormorants appear sporadically, chiefly in winter. The refuge hosts common loons and horned grebes from September or October through May; however, numbers usually peak in November and December. Nearly 100 individuals of each species have been documented. Snowy egrets, great blue herons, great egrets, and green-backed herons also are common at Morton, usually on the lagoon and ponds.

Fourteen species of shorebirds and plovers have been observed at the refuge. Ruddy turnstones, black-bellied plovers, willets, and greater yellowlegs are the most common in the warmer months. Sanderlings are sighted on the beach in every month of the year, although they are more common in autumn and winter. American oystercatchers and whimbrels, uncommon to the Peconic Bay area, occasionally have been observed.

Gulls are conspicuous at the refuge. Their numbers are lowest in summer and higher the rest of the year. Approximately 200 gulls routinely loaf on the beach. About half of those are herring gulls, and half are great black-backed gulls. Tern species such as royal, Forster's, and arctic terns are also observed at Morton in late summer and early autumn.

Other Migratory Birds.—Bank swallows nest on the western bluffs of Jessup's Neck. More than 100 burrows have been counted at the colony, estimated at 40 pairs. Volunteers monitor the use of songbird nest boxes on the refuge in the spring and summer. Tree swallows and house wrens are the most common species using the boxes.

Forty-six songbird species have been observed on the refuge. The most common include gray catbird, common yellowthroat, mourning dove, yellow warbler, and robin. Forest interior species such as ovenbird, redstart, red-eyed vireo, wood peewee, and wood thrush have been detected using its relatively small acreage of mature forest.

Mammals

The most commonly sighted mammals at Morton include white-tailed deer, eastern chipmunk, eastern cottontail, gray squirrel, and red fox.

Marine Mammals.—Seasonal sightings of harbor seals are common at Morton, either hauling out on the beach or swimming near inshore areas in March, November and December. Seal sightings on Long Island are continuing to increase.

Rare, Threatened or Endangered Species

Morton also provides habitat for several state- and federal-listed endangered or threatened species, including piping plovers, peregrine falcons, roseate, common, and least terns, Kemp's Ridley turtles and loggerhead sea turtles.

Rare wildlife species historically have used the Jessup's Neck portion of the refuge. Although we close most of that peninsula to the public for the late spring to midsummer breeding season, the public can observe all of those species from the part of the beach that remains open.

Piping plovers, federal-listed as threatened, arrive at Morton between mid-March and early April. Once a full clutch of eggs has been laid, the refuge erects an exclosure around the nest. Volunteers monitor hatching and fledging rates. The heaviest use of the refuge by plovers occurs in July: not only nesting adults and their young, but also adults and fledglings from other areas forage and loaf there. A maximum of 19 piping plovers has been documented in a single day.

The osprey, a state-listed species of concern, is a highly visible raptor at Morton. One to four pairs have nested on the refuge for the last three decades, and have successfully fledged young each year.

Terns are highly visible species at the refuge in late spring and early summer. The most common species include two state-designated threatened species, the common tern and the least tern, and a federal-listed endangered species, the roseate tern. The peninsula at Morton is a favorite loafing site, and the surrounding bays provide excellent foraging habitat for all tern species at that time of year. For the first time in many years, a least tern colony successfully fledged approximately 30 chicks in 2003, and has bred there in subsequent years. The refuge also serves as a local staging area for many terns before the breeding season.

Lido Beach Wildlife Management Area

Lido Beach is located on the bay side of Long Beach, on a barrier island west of Jones Inlet in Nassau County. Like the rest of Hempstead Bay, it lies in the vicinity of dense residential and commercial development (see map 3-5).

Terrestrial Habitats

Lido Beach consists of 22 acres of salt marsh and shrub thickets. Dense stands of great reed and a mixture of upland shrubs and grasses dominate the marsh/upland edge. The shrub thickets of Lido Beach consist of red mulberry, groundsel bush, bayberry, and great reed. The thickets provide roosting and nesting habitat for various long-legged wading birds, particularly black-crowned night-herons.

An abandoned Nike missile pad lies next to the management area. The rectangular, flat-topped, 4.6 acre hill overlooking the marsh is undergoing succession much in the manner of an abandoned parking lot. Common species are ragweed, goldenrod, blackberries, and poison ivy along the edges of the pad.

Wetland Habitats

The marsh at Lido Beach is a typical mixture of salt hay and salt grass; some black grass, glassworts, and smooth cordgrass also are present. Approximately 45 percent of Lido Beach is ditched high salt marsh. That ditching is deep, and well-flushed by daily tides. Two mudflats on the marsh are being pioneered by glasswort species. The mud flats provide an excellent foraging area for a variety of shorebirds.

Aquatic Habitats

Lido Beach is part of the Hempstead estuary, which is noted for its impressive concentrations of waterfowl, long-legged waders, terns, and shorebirds. Hempstead Bay is one of the largest undeveloped coastal wetland ecosystems in New York. Although small in size and forming only a modest portion of the Bay, Lido Beach provides important habitat for wetland-dependent wildlife.

Fish and Wildlife

The Wildlife Management Area consists primarily of tidal wetland. The diversity of shorebirds and wading bird is high, as is the use by waterfowl, particularly black ducks and Atlantic brant in winter. The area supports nesting clapper rails, black-crowned night-herons and osprey, as well as numerous songbirds such as sharp-tailed sparrows. Its location on a barrier island makes it an excellent habitat for migrating songbirds and raptors.

Birds

Raptors.—Northern harriers, sharp-shinned hawks, and ospreys are commonly observed at Lido Beach.

Waterfowl.—Waterfowl sightings are numerous and diverse. The species most commonly observed are black ducks, mallards, Atlantic brants, Canada geese,

U.S. Fish & Wildlife Service

Map 3-5

Lido Beach Wildlife Management Area

Nassau County, New York

Vegetation Cover Map

Refuge Boundary (22 Acres)

Vegetation Cover

- Bridge
- Water
- North Atlantic High Salt Marsh *Spartina patens - Distichlis spicata - (Juncus gerardii)* Herbaceous Vegetation
- Northern Tall Maritime Shrubland *Amelanchier canadensis - Viburnum spp. - Morella pensylvanica* Shrubland
- Reed-grass Marsh *Phragmites australis* Tidal Herbaceous Vegetation

1:5,083

0 0.1 0.2 Miles

0 0.1 0.2 0.3 Kilometers

N W E S

Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

and long-tailed ducks (oldsquaws). In January, the numbers of Atlantic brants and black ducks peak at 2,000 and 75.

Shorebirds, Gulls, Terns and Allied Species.—Eight species of herons, egrets and ibises have been observed at Lido Beach. Other marsh and waterbird species observed include double-crested cormorant, great cormorant, clapper rail, and belted kingfisher.

The Hempstead Harbor is known for its concentrations of shorebirds during migration. Plovers and sandpipers are commonly observed at Lido Beach. Occasionally, such shorebird species as whimbrels, marbled godwits, and pectoral sandpipers may be observed in the management area. Willets nest there in early summer, and glossy ibis have been sighted roosting on the piles of dredge spoil.

Gulls are commonly observed at Lido Beach. Sightings of Bonaparte's gulls are accidentals in the area. Common, least, and royal terns are usually observed from April through July.

Rare, Threatened or Endangered Species

Least terns, a state-listed threatened species, are observed at Lido Beach from May through July. Ospreys, a state-designated species of concern, are observed from February through August. Northern harriers, a state-listed threatened species, are present from December through February.

© Janet C. Zinn

Ospreys are a New York State species of concern that are present at the refuge from February through August.

Oyster Bay National Wildlife Refuge

Oyster Bay National Wildlife Refuge is located on the north shore of Long Island in eastern Nassau County in the Town of Oyster Bay. It is 20 miles east of New York City and 5 miles west of Target Rock. The major refuge holdings are in Oyster Bay Harbor and the western portion of Cold Spring Harbor. The waters of Oyster Bay surround Sagamore Hill National Historic Site, home of Theodore Roosevelt, the founder of the first national wildlife refuge. Please note that "Oyster Bay" in this document refers to Oyster Bay National Wildlife Refuge. See maps 3-6 and 3-7.

Wetland Habitats

The refuge includes more than 3,000 acres of bay bottom and surface waters up to the mean high tide line, in addition to the channels and marshes of Frost, Oak Neck, and Mill Neck creeks. Mill Pond is an 8-acre freshwater pond that drains into Oyster Bay Harbor at Beekman Beach. The refuge consists largely of subtidal habitats 2 m to 9 m in depth, linear strands of intertidal salt marsh, and a minor extent of high salt marsh and freshwater wetlands.

Aquatic Habitats

Oyster Bay is the largest refuge in the Complex. Its 3,204 acres of bay bottom, salt marsh, and a small freshwater wetland are managed principally for use by migratory waterfowl and other waterbirds. It is also one of the few bay-bottom refuges owned and managed by the Service. Bay bottom composes 78 percent of the refuge; unconsolidated shoreline, 3 percent; *Spartina alterniflora* fringe along the shore, 5 percent; high marsh at the west end of the harbor, 5 percent; and an estuarine stream bed makes up the remainder, approximately 9 percent. The refuge is located off Long Island Sound, and the sheltered nature of the bay makes it extremely attractive as winter habitat for a variety of waterfowl species, especially diving ducks.

The State of New York has designated the Oyster Bay area as a Significant Coastal Fish and Wildlife Habitat. Marine wildlife common to the refuge includes harbor seals, diamondback terrapins, and several species of sea turtles. Shellfish and finfish are abundant at Oyster Bay. The bay supports the only commercial oyster farm aquaculture operation remaining on Long Island, and an estimated 90 percent of the commercial oysters in New York originates from areas associated with the refuge.

Oyster Bay receives the greatest amount of public use of any refuge on Long Island. Recreational boaters use it heavily from May through September: on peak weekends, approximately 3,000 boats use the refuge; on weekdays, 1,000 boats per day are common. The construction and expansion of un-permitted docks and other shoreline structures is a major concern on the refuge, as is general water quality.

Fish and Wildlife

More than 126 bird species have been documented at the refuge, including 23 species of waterfowl. Numerous waterfowl species over-winter in Oyster Bay;

U.S. Fish & Wildlife Service

Map 3-6

Oyster Bay National Wildlife Refuge - Frost Creek Unit

Nassau County, New York

Vegetation Cover Map

Refuge Boundary (84 Acres)

Bridge

Sand Beach

Sand

Water

Vegetation Cover

Turf Grass

Acer rubrum - *Fraxinus (pennsylvanica, americana) / Lindera benzoin / Symplocarpus foetidus* Forest

Robinia pseudoacacia Forest

Reed-grass Marsh *Phragmites australis* Tidal Herbaceous Vegetation

Salt Shrub *Baccharis halimifolia - Iva frutescens / Spartina patens* Shrubland

North Atlantic Low Salt Marsh *Spartina alterniflora / (Ascophyllum nodosum)* Acadian / Virginian Zone Herbaceous Vegetation

1:13,312

0 0.25 0.5 Miles

0 0.25 0.5 0.75 Kilometers

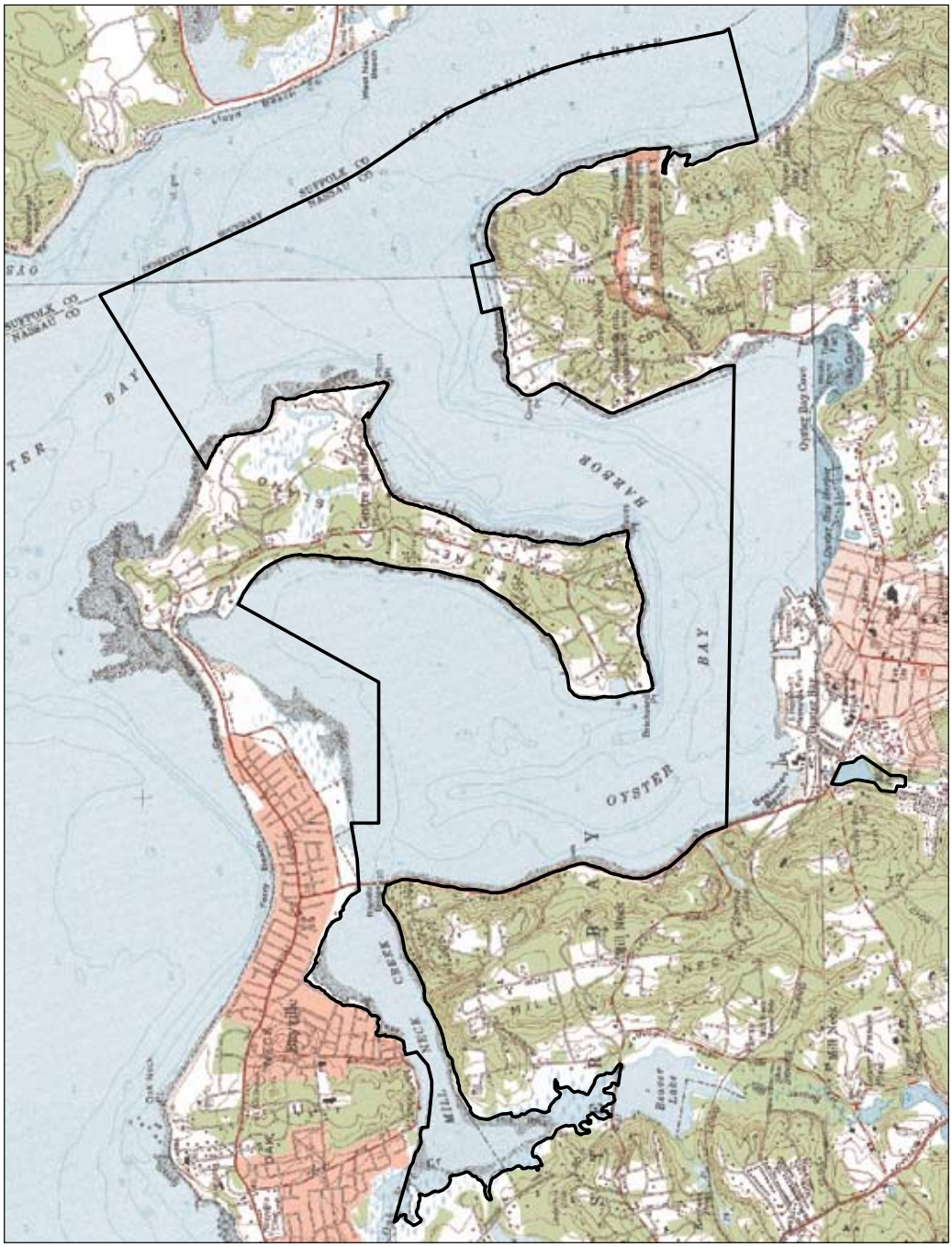
N W E S

Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

U.S. Fish & Wildlife Service

Oyster Bay National Wildlife Refuge
Nassau County, New York

Map 3-7
Topographic Map



Refuge Boundary
(3,204 Acres)

1:44,501

0 1 2 Miles

0 1 2 3 Kilometers

Produced by Long Island NWR Complex, Shirley, New York
Bathymetric DEM: USGS National Mapping Program
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

more than 20,000 ducks have been reported for one survey during peak use. The other waterbirds the refuge supports in large numbers include double-crested cormorants, Forster's and common terns, wading birds, and shorebirds. Certain areas of Oyster Bay, like Mill Neck Creek and Frost Creek, provide breeding habitat for black duck, clapper rail, and osprey.

Birds

Raptors.—Ospreys, a state-designated species of concern, nest and have successfully fledged their young along the Mill Neck Creek marsh. Other raptor species observed at Oyster Bay include the northern harrier, red-tailed hawk, American kestrel, merlin and sharp-shinned hawk.

Waterfowl.—Oyster Bay has the greatest winter waterfowl use of any of the Long Island refuges. The numbers of waterfowl using Oyster Bay are lowest from May through August, and start to increase in September and October. Puddle ducks such as black ducks, gadwall, and mallards start migrating to the refuge in early autumn, and their diversity begins to increase in November. Waterfowl numbers peak and remain high from December through March, then decline in April. The New York Department of State has singled out Oyster Bay as having the greatest concentration of waterfowl on Long Island's north shore.

The three waterfowl species that most commonly use the refuge in winter include the greater scaup, bufflehead, and black duck. Those species compose approximately 85 percent of all ducks using the refuge. Greater scaup compose more than half; bufflehead make up 20 percent; and black duck, the most common puddle duck species, close to 10 percent.

Waterfowl use is not uniform across the refuge. The Bayville, Cold Spring Harbor, and Mill Neck Creek areas support in excess of 80 percent of that use. Bayville alone accounts for nearly half. The majority of the greater scaup and bufflehead on the refuge use its Bayville and Cold Spring Harbor sections, while the Mill Neck Creek section had the greatest use by black duck and canvasback.

Shorebirds, Gulls, Terns and Allied Species.—The most common waterbird on the refuge is the double-crested cormorant, which is seen year-round. Its numbers are highest from April through October. Great cormorants appear at low numbers in the winter. Other waterbirds that use the refuge include loons, grebes, herons, and egrets.

Gulls are common on the refuge, and normally reach a maximum of about 1,500 birds in the winter. Herring gulls are more numerous in winter than in the warmer months. Great black-backed gulls are present year-round, but are less numerous than herring gulls. Ring-billed gulls also are common in the winter months but they, too, are fewer than herring gulls. Laughing gulls use the refuge in the summer, and Bonaparte's gulls in the winter.

Terns use Oyster Bay from May through October. Common and least tern use is heaviest from May through August. Forster's terns are present on the refuge in good numbers in September and October.

Seven species of shorebirds are commonly observed on the refuge. The most common include black-bellied plovers, dunlins, greater yellowlegs, and least and spotted sandpipers.

Mammals

Harbor seals are observed on the refuge primarily in March.

John Mosesso, Jr./NBII

Harbor seals

Reptiles and Amphibians

The northern diamondback terrapin is common at Oyster Bay, particularly in the Frost Creek and Mill Neck Creek sections. The refuge is considered to have one of the largest populations of diamondback terrapins on Long Island.

Rare, Threatened or Endangered Species

Federal- and state-designated endangered or threatened species known to use Oyster Bay include the bald eagle, peregrine falcon, northern harrier, least tern, and Kemp's ridley and loggerhead sea turtles. Peregrine falcons typically migrate through Oyster Bay in the autumn and spring. Bald eagles visit the refuge sporadically in winter. Ospreys nest and have successfully fledged young on the refuge. Northern harriers are observed in their spring and autumn migrations. Atlantic loggerhead and Kemp's ridley sea turtles are known to forage in Oyster Bay. However, sightings of the turtles are rare, and on those occasions they are usually the victims of an injury or cold stunning.

Sayville Unit

Sayville, a sub-unit of Wertheim, is located in West Sayville, New York, about 2 miles inland from the Great South Bay. This is the only land-locked refuge in the Complex (see map 3-8).

Terrestrial Habitats

Sayville, and its associated 101-acre FAA property, consists primarily of pitch pine and scrub oak stands, interspersed with grasslands dominated by little bluestem. The FAA property supports the largest population in New York State of the federally listed endangered sandplain gerardia. The continual management of sandplain gerardia at Sayville and other Complex refuges is vital for its recovery. The FAA was legally mandated to transfer the 101-acre property to the Service after the buildings were removed. At this point, the buildings have been removed, but the property has yet to be transferred.

A variety of terrestrial migratory birds uses the refuge, and the potential exists for attracting more grassland-dependent birds.

Fish and Wildlife

The lack of surface waters at Sayville limits its species diversity to terrestrial species. Its terrestrial habitats, young pitch pines, scrub oaks, and grasslands, provide excellent habitat for Neotropical migratory birds and resident passerines.

Birds

Raptors.—Sayville provides important migratory habitat for certain raptor species, particularly American kestrel, and sharp-shinned, Cooper's, and red-tailed hawks.

Other Migratory Birds.—Songbirds are a conspicuous component of species at Sayville. That songbird community is diverse, and includes many Neotropical migrant species. Breeding songbirds dominant in forested habitats include the ovenbird, American redstart, common yellowthroat, gray catbird, and rufous-sided towhee. Breeding songbirds dominant in shrub and grassland habitats include song sparrows, swallows, and blue-winged, yellow, and prairie warblers.

Mammals

Dominant terrestrial mammals include white-tailed deer, eastern cottontail, gray squirrel, eastern mole, eastern chipmunk, white-footed mouse, meadow vole, red fox, opossum, short-tailed shrew, and raccoon.

Reptiles and Amphibians

Eastern box turtles and eastern hognose snakes are of interest because of their perceived current decline on Long Island, where both were once considered abundant, dominant species.

U.S. Fish & Wildlife Service

Map 3-8

Sayville Unit of Wertheim National Wildlife Refuge and FAA Site

Suffolk County, New York

Vegetation Cover Map

Unit Boundary (26 Acres)

FAA Property Boundary (101 Acres)

Building

Dirt Path

Driveway

Sidewalk

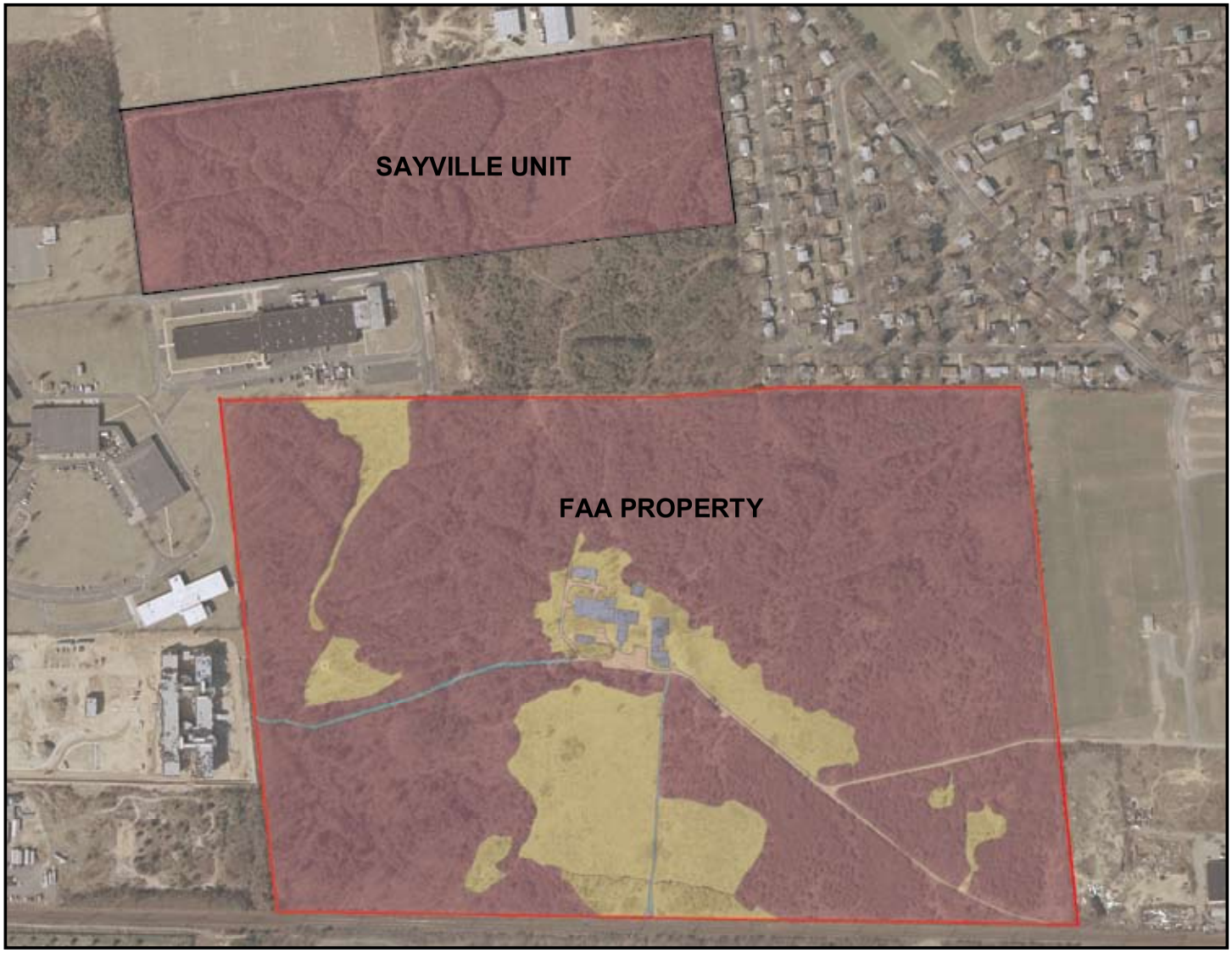
Paved Road

Slab

Vegetation Cover

Old-field Red-cedar Forest *Juniperus virginiana* Forest

Pitch Pine - Oak Coastal Forest *Pinus rigida - Quercus coccinea / Vaccinium pallidum - (Morella pensylvanica)* Forest



Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

1:6,091

0 0.1 0.2 Miles

0 0.1 0.2 0.3 Kilometers

N W E S

Don Sias/TNC

Sandplain gerardia

Rare, Threatened or Endangered Species

On September 7, 1988, sandplain gerardia was listed as an endangered species under the provisions of the Endangered Species Act of 1973, as amended. The plant is known to grow at two sites on Cape Cod, six sites on Long Island, one site in Baltimore County, Maryland, and one site in Washington County, Rhode Island. Its overall population has declined from 49 historical records to the 10 populations that remain today. Its decline can be attributed to the loss and degradation of suitable habitat caused by increased development, vegetative succession, and changing historical disturbance regimes.

Seatuck National Wildlife Refuge

Seatuck is located on Long Island's south shore in Islip, New York. The refuge borders the National Audubon Scully Sanctuary to the west, suburban development to the north, Champlin Creek to the east, and Great South Bay to the south. We acquired the 196-acre refuge in 1968 by donation from the Peters family under the Migratory Bird Conservation Act *"...for use as an inviolate sanctuary, or for any other management purposes, for migratory birds"* (1929). See maps 3-9 and 3-10.

Terrestrial Habitats

Upland habitats including old fields, brush, and woodland form about one-half of Seatuck. The upland habitats are equally divided among mixed-oak woodland, red maple stands, upland shrub, and grasslands. Pine barren habitat also is present. The grasslands are about equally divided between cool season and warm season grassland types.

The wildlife attracted to the upland areas includes nesting purple martins, white-tailed deer, red fox and songbirds. The coastal setting and habitats appeal to numerous migrating raptors. Our management includes protecting forest, managing grassland, controlling invasive species, maintaining nesting structures, and restoring derelict lands.

Wetland Habitats

The remaining half of the refuge is salt marsh, consisting largely of salt hay and expansive salt pannes. Stands of great reed intermix in the marsh, and also form a wide buffer along its upland edge. Freshwater wetlands and ponds also are present. The bulk of the aquatic habitats include salt marsh and subtidal types. The numerous wildlife species present include waterfowl, shorebirds, wading birds, and nesting ospreys.

Fish and Wildlife

Seatuck is essentially an island of wildlife habitat surrounded by suburban development. More than 210 avian species have been documented at the refuge. Mammals, including white-tailed deer, raccoon and red fox, are common and conspicuous. Ospreys, a state species of special concern, nest on the refuge. Peregrine falcons routinely have been observed. Waterfowl, including black ducks, are present year-round, but are most common in winter. Wading birds and shorebirds are conspicuous at the refuge. In the breeding and migrating seasons, songbirds are found in various upland areas.

Birds

Raptors.—Seatuck provides important habitat for raptors moving along the Long Island coast. They are commonly observed at the refuge in their spring and autumn migrations.

U.S. Fish & Wildlife Service

Map 3-9

Seatuck National Wildlife Refuge

Suffolk County, New York

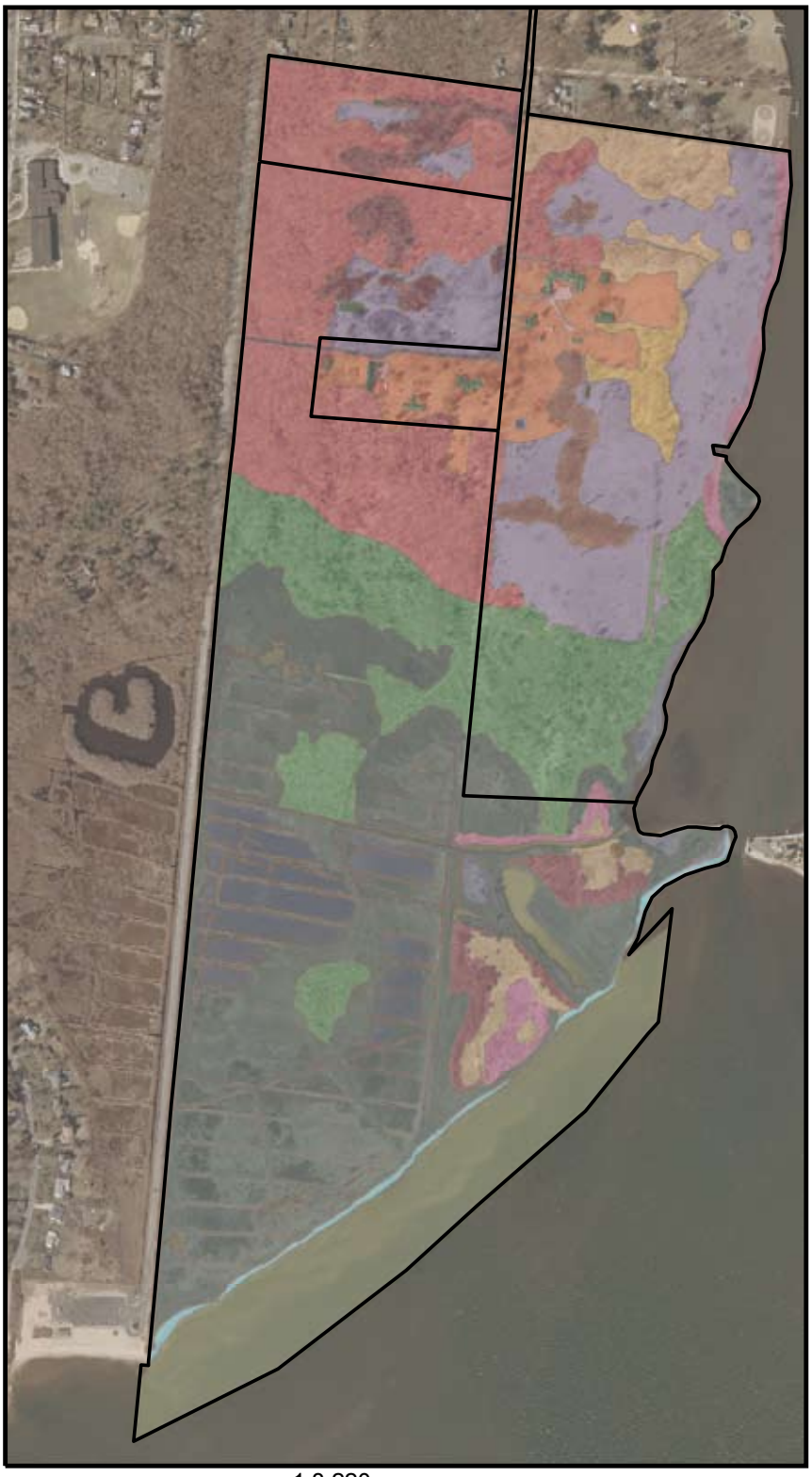
Vegetation Cover Map

Refuge Boundary (209 Acres)

- Building
- Dirt Driveway
- Dirt Road
- Paved Road
- Sand
- Sand Beach
- Water
- Turf Grass

Vegetation Cover

- Black Locust Successional Forest *(Robinia pseudoacacia* Forest)
- Coastal Oak - Beech Forest *Fagus grandifolia - Quercus alba - Quercus rubra* Forest
- Coastal Oak / Heath Forest *Quercus coccinea - Quercus velutina / Sassafras albidum / Vaccinium pallidum* Forest
- Lower New England Red Maple Swamp *Acer rubrum - Fraxinus (pennsylvanica, americana) / Lindera benzoin / Symplocarpus foetidus* Forest
- North Atlantic High Salt Marsh *Spartina patens - Distichlis spicata - (Juncus gerardii)* Herbaceous Vegetation
- Pitch Pine - Oak Coastal Forest *Pinus rigida - Quercus coccinea / Vaccinium pallidum - (Morella pensylvanica)* Forest
- Reed-grass Marsh *Phragmites australis Tidal* Herbaceous Vegetation
- Salt Shrub *Baccharis halimifolia - Iva frutescens / Spartina patens* Shrubland
- Sandplain Grassland *Morella pensylvanica / Schizachyrium littorale - Danthonia spicata* Shrub Herbaceous Vegetation
- Successional Maritime Forest *Prunus serotina - Sassafras albidum - Amelanchier canadensis / Smilax rotundifolia* Shrubland



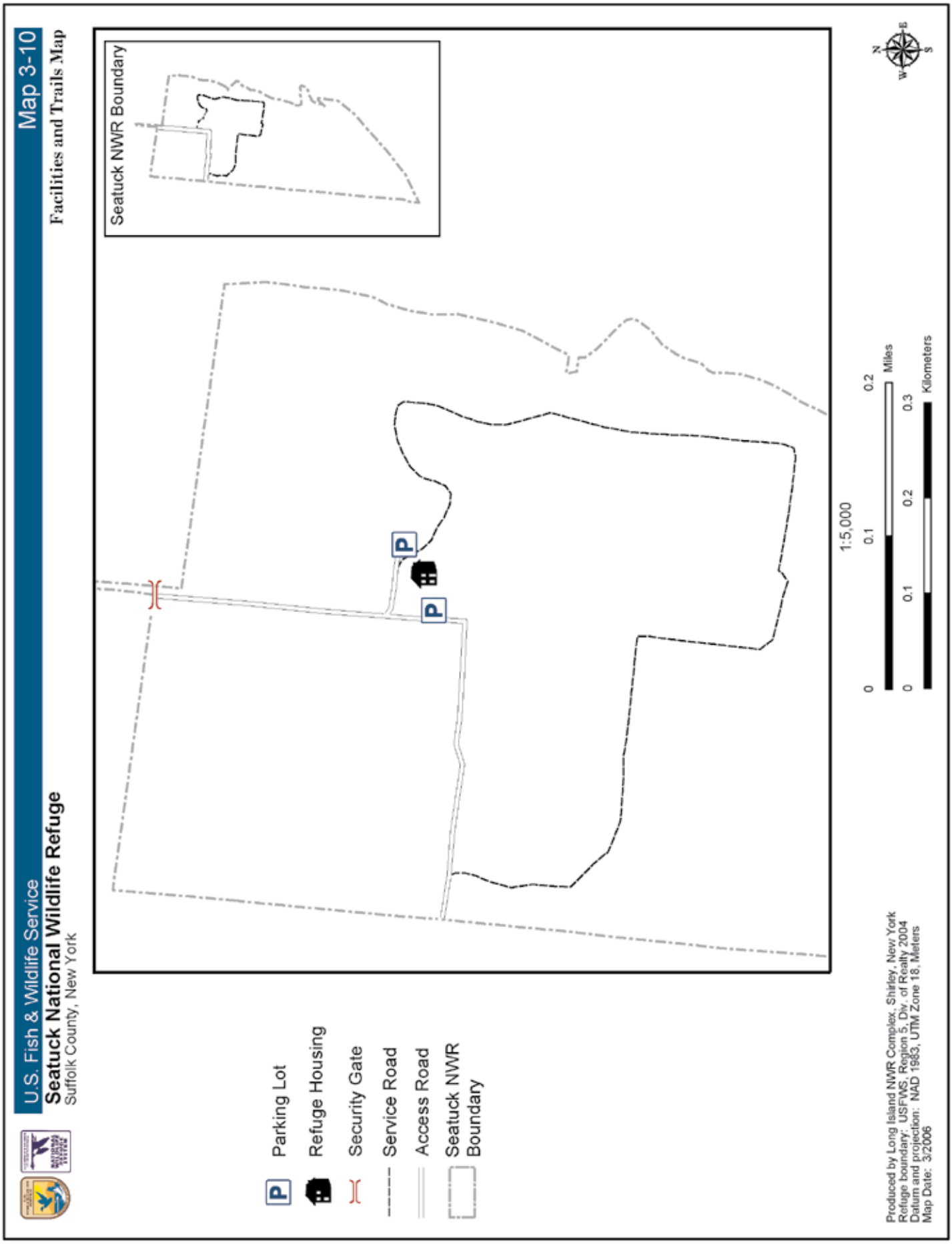
1:8,220

0 0.2 0.4 Miles

0 0.2 0.4 0.6 Kilometers

N W E S

Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006


U.S. Fish & Wildlife Service
Map 3-10
Seatuck National Wildlife Refuge
Suffolk County, New York
Facilities and Trails Map
Seatuck NWR Boundary
Parking Lot
Refuge Housing
Security Gate
Service Road
Access Road
Seatuck NWR Boundary
1:5,000
0
0.1
0.2
Miles
0
0.1
0.2
0.3
Kilometers
Produced by Long Island NWR Complex, Shirley, New York
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

Waterfowl.—Seventeen species of waterfowl have been observed on the refuge. Long-tailed ducks are observed in January and April. Black duck, greater scaup, bufflehead, and red breasted merganser are present in their greatest numbers in late fall and winter. Green-winged teals are fairly common in the autumn.

Shorebirds, Gulls, Terns and Allied Species.—Nine species of herons, egrets and ibises are commonly observed on the refuge. Great blue herons, snowy egrets, green-backed herons, and great egrets are most common. The number of long-legged wading birds peaks in August, and there is a smaller peak earlier in April. American bitterns are conspicuous in the winter and, surprisingly, a least bittern, rare for Long Island, has been observed on the refuge.

Four species of gulls (herring, great black-backed, ring-billed, and laughing) are commonly observed on the refuge. Herring gulls are the most abundant, and are present year-round. Least and common terns are observed there from May through August.

Other shorebirds observed include yellowlegs, sandpiper, black-bellied plover, killdeer, dunlin, and willet. Shorebird numbers peak in August, but high numbers are also present in May, July and September.

Other Migratory Birds.—Birds that depend upon forest edges, shrubs, and wetlands are most prevalent. On the whole refuge, the most common birds detected are red-winged blackbird, common yellowthroat, tree swallow, gray catbird, American crow, sharp-tailed sparrow, mourning dove, and northern cardinal.

Mammals

White-tailed deer are the most conspicuous and controversial wildlife species at Seatuck. The herd has a high density, and neighbors frequently voice complaints about the damage it causes. They have also expressed concerns about the potential for deer-vehicle collisions and the incidence of Lyme disease in the community. Other species resident on the refuge include gray squirrel, mice, vole, shrew, eastern cottontail, red fox, raccoon, and feral cat.

Fish

After a salt marsh restoration in 1992, both the diversity and abundance of fish species increased dramatically. Ecologically, these forage fish contribute significantly to the food web in the Great South Bay estuary. The species most commonly observed are the sheepshead minnow, banded killifish, and marsh killifish. Others observed include the Atlantic silverside, American eel, mosquitofish, menhaden, stickleback, and striped killifish.

Rare, Threatened or Endangered Species

Ospreys, a New York State species of special concern, have been increasing on Long Island for the past 5 years. They have nested at Seatuck since 1983, with a notable increase in the number of nests and production there. Common terns and least terns, State-listed species, forage in the refuge shallows between May and August.

Target Rock National Wildlife Refuge

Target Rock is an 80-acre refuge of mixed upland forest in varying stages of succession, a half-mile rocky beach along Huntington Bay, a brackish pond and several vernal ponds. The refuge is located on the north shore of Long Island in western Suffolk County. See maps 3-11 and 3-12.

Terrestrial Habitats

The refuge consists largely of mature oak forest characteristic of Long Island's north shore. Dominant tree species include the black oak, red oak, white oak, hickory and tulip tree. The canopy is open, and individual trees in many cases are 60 feet to 80 feet in height. The understory is largely composed of maple-leaved viburnum and mountain laurel, although the presence of other shrubs and vines creates impenetrable tangles where the canopy is even more open. Other terrestrial habitats include forest openings, red maple forest, and bluffs. The areas of sand ridge have juniper trees, which provide habitats for "olive" juniper hairstreak butterflies. The eastern prickly pear cactus, a state-protected species, is found in the sand ridge areas of the beach.

Wetland Habitats

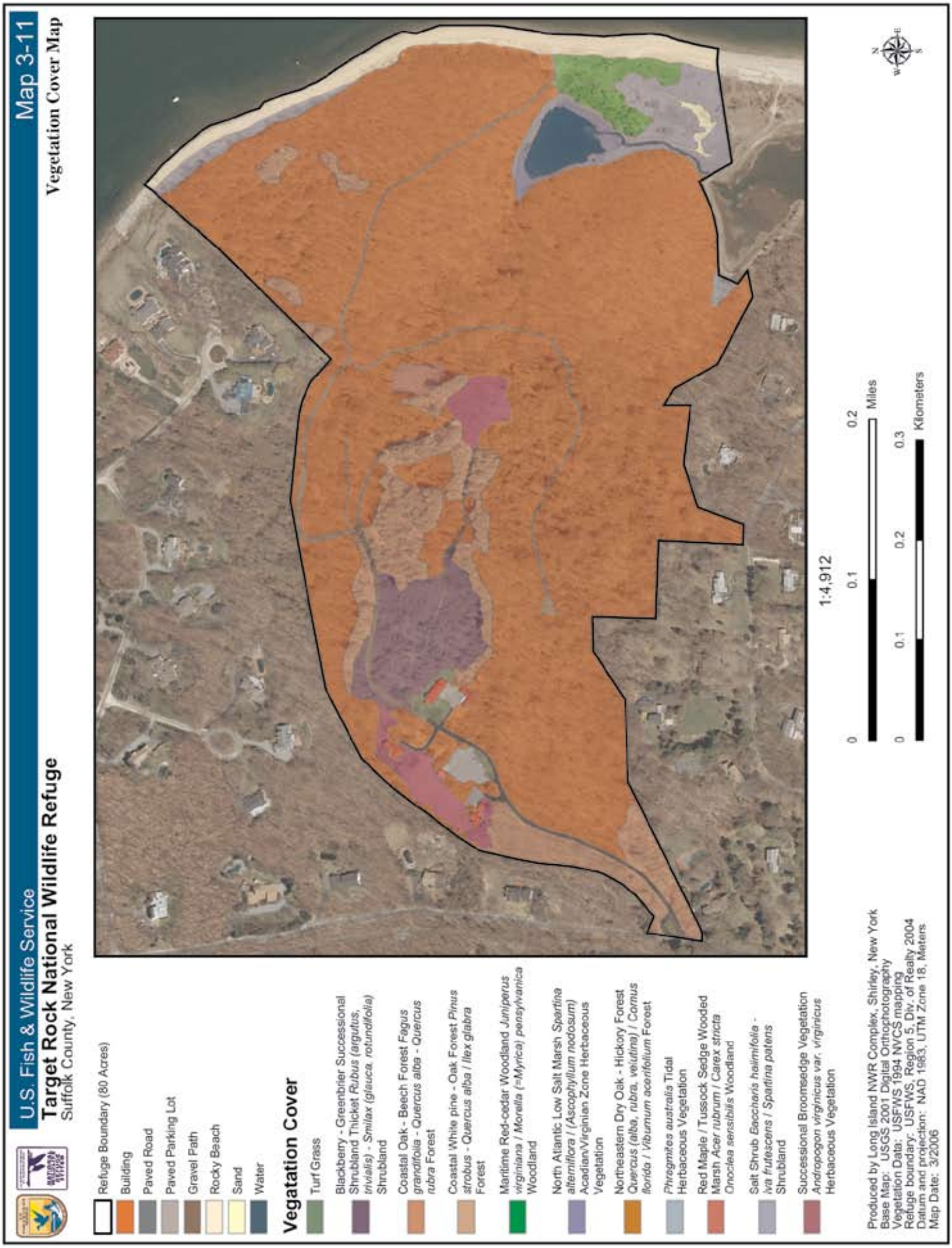
The refuge contains a 1 acre brackish pond surrounded by marsh elder and saltmeadow cordgrass. A small outlet to the south connects it to regular tidal flow.

Aquatic Habitats

The Target Rock beach is regularly flooded. Its exposed, stony shoreline consists of rocks ranging in size from gravel to cobble. Boulders in the bay can measure

M. Lin/USFWS

View of Huntington Bay from Target Rock refuge.


U.S. Fish & Wildlife Service
Map 3-11
Target Rock National Wildlife Refuge
Suffolk County, New York
Vegetation Cover Map
Refuge Boundary (80 Acres)
Building
Paved Road
Paved Parking Lot
Gravel Path
Rocky Beach
Sand
Water
Vegatation Cover
Turf Grass
Blackberry - Greenbrier Successional Shrubland Thicket Rubus (argutus, trivialis) - Smilax (glauca, rotundifolia) Shrubland
Coastal Oak - Beech Forest Fagus grandifolia - Quercus alba - Quercus rubra Forest
Coastal White pine - Oak Forest Pinus strobus - Quercus alba / Ilex glabra Forest
Maritime Red-cedar Woodland Juniperus virginiana / Morella (=Myrica) pensylvanica Woodland
North Atlantic Low Salt Marsh Spartina alterniflora / (Ascophyllum nodosum) Acadian/Virginian Zone Herbaceous Vegetation
Northeastern Dry Oak - Hickory Forest Quercus (alba, rubra, velutina) / Cornus florida / Viburnum acerifolium Forest
Phragmites australis Tidal Herbaceous Vegetation
Red Maple / Tussock Sedge Wooded Marsh Acer rubrum / Carex stricta
Onoclea sensibilis Woodland
Salt Shrub Baccharis halimifolia - Iva frutescens / Spartina patens Shrubland
Successional Broomsedge Vegetation Andropogon virginicus var. virginicus Herbaceous Vegetation
Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006
1:4,912
0 0.1 0.2
0 0.1 0.2 0.3
Miles
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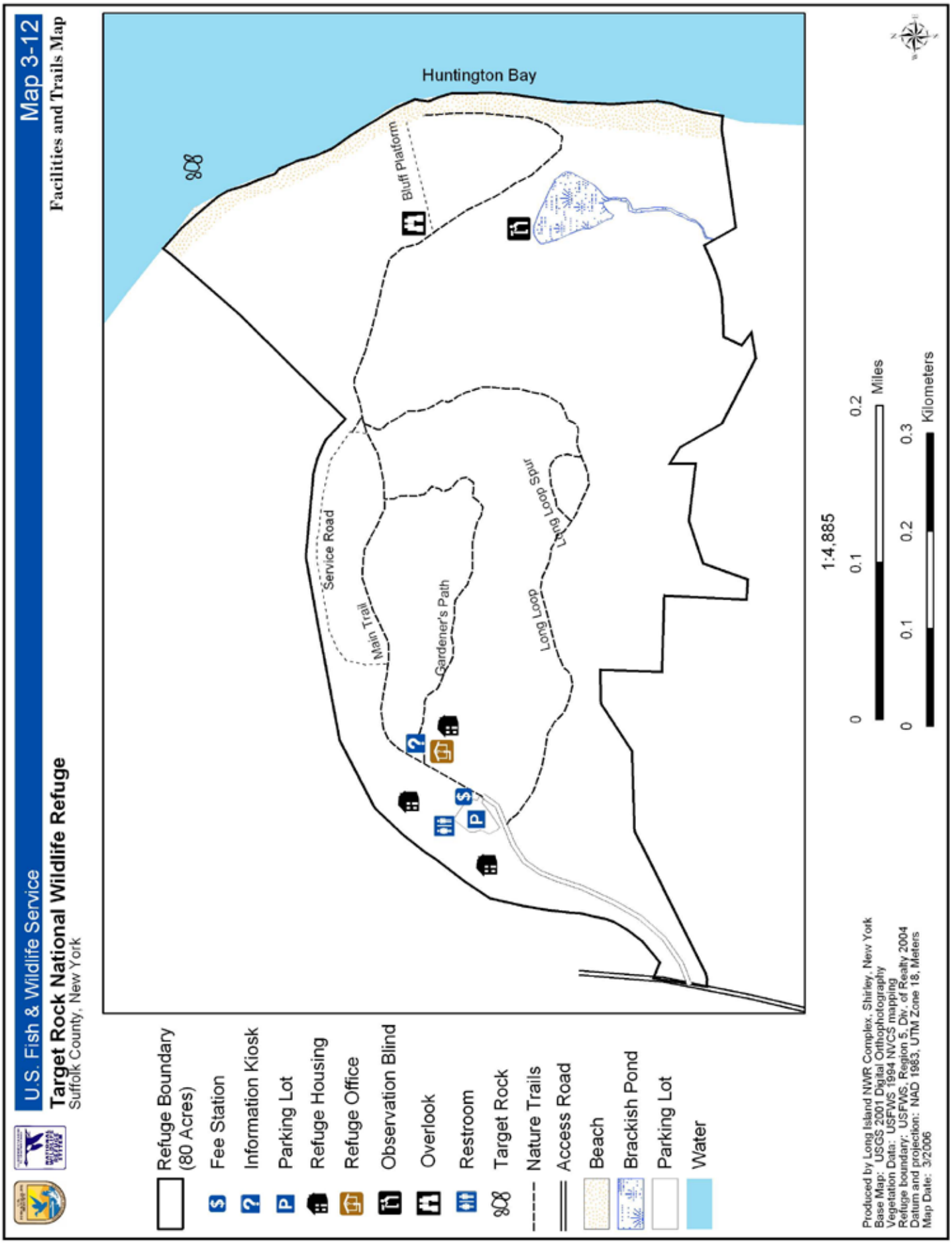

U.S. Fish & Wildlife Service
Map 3-12
Target Rock National Wildlife Refuge
Suffolk County, New York
Facilities and Trails Map
Huntington Bay
Bluff Platform
Service Road
Main Trail
Gardener's Path
Long Loop
Long Loop Spur
Refuge Boundary (80 Acres)
Fee Station
Information Kiosk
Parking Lot
Refuge Housing
Refuge Office
Observation Blind
Overlook
Restroom
Target Rock
Nature Trails
Access Road
Beach
Brackish Pond
Parking Lot
Water
1:4,885
0 0.1 0.2 Miles
0 0.1 0.2 0.3 Kilometers
Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

several feet in height, and rest on two tidal flats thickly encrusted with blue mussels. Inland from the shore, the substrate becomes progressively sandier. Uplands adjacent to the beach are dominated by beach grass, or otherwise lack vegetation.

Several hundred feet of the refuge beach is closed from early spring through late summer, to protect nesting bank swallows and belted kingfishers, provide undisturbed piping plover habitat, and also provide a beach free of disturbance for terns, shorebirds and other wildlife.

Fish and Wildlife

More than 200 avian species have been documented at Target Rock, of which more than 50 have been recorded as breeders. The refuge offers suitable habitats for many forest-, wetland-, and beach-dependent species, and provides an important stopover for many migrants. A variety of marine wildlife use the waters adjacent to Target Rock. Harbor seals use the coastline for feeding and loafing, as do leatherback and Kemp's ridley sea turtles. The shoreline supports a marine rocky intertidal community.

The chestnut oak/mountain laurel association and oak hardwood forest offer good food and cover for Neotropical songbirds, which are common during spring migration. Waterfowl, shorebirds, and waterbirds are common on the beach and off-shore. The headlands provide nesting habitat for belted kingfishers and bank swallows. Piping plovers use the refuge beach for foraging, and nest on adjacent lands.

Birds

Raptors.—The raptors most commonly observed at Target Rock include the great horned and eastern screech owls, ospreys, American kestrels, merlins, and sharp-shinned, Cooper's, and red-tailed hawks. Screech owls abound on the refuge, and are easily detected.

Waterfowl.—Waterfowl use the brackish pond and the rocky shoreline. Their numbers usually peak in winter, from October through March. Puddle ducks compose about one-fourth of the ducks using the refuge, and black ducks are by far the dominant puddle duck. The most common diving ducks include the common goldeneye, greater scaup, long-tailed duck, bufflehead, and red-breasted merganser. Harlequin ducks are occasionally observed near the historical Target Rock in Huntington Bay.

Shorebirds, Gulls, Terns and Allied Species.—Common loons, red-throated loons, great cormorants, and horned grebes are common off the refuge beach in winter. In summer, double-crested cormorants are easily observed. Six species of long-legged waders are commonly documented on the refuge, mostly in its brackish pond habitat.

Numerous sandpipers also make use of the rocky beach and brackish pond. The most common shorebird species include greater yellowlegs, black-bellied plovers, semi-palmated plovers, spotted sandpipers, and willets. Common and least terns are observed on the refuge from May through September.

Other Migratory Birds.—Thirty-five Neotropical bird species have been documented at Target Rock. The sand bluffs above the refuge beach provide a specialized nesting habitat for several avian species. In 2001, approximately 10 pairs of bank swallows nested, as did belted kingfisher and northern rough-winged swallows. Closing a portion of the refuge beach appears to benefit these bluff-nesting species.

Mammals

The species most commonly observed on the refuge include the red fox, gray squirrel, eastern chipmunk, and eastern cottontail. White-tailed deer, presumably absent since the 1950s, have again been sighted in recent years.

Marine Mammals.—Harbor seals are observed periodically either swimming or hauled out on some of the rocks off the refuge beach. In the last two weeks of September 2001, that use was greatest when a harbor seal spent most of its time either hauled out on the beach or swimming parallel to it.

Rare, Threatened or Endangered Species

Piping plovers forage on the refuge beach and nest on the beach approximately a quarter-mile away from the refuge. State-listed least and common terns also forage along the refuge shore. Colonies of those terns as well as piping plovers nest directly across from the refuge at Eaton's Neck in Northport and at Caumsett State Park in Lloyd Harbor.

Wertheim National Wildlife Refuge

Wertheim is the second-largest refuge in the Complex, at 2,572 acres. The acreage of its terrestrial and aquatic habitats is about equal. The terrestrial habitats are principally pine barren types; the aquatic habitats include both tidal and non-tidal surface types. Tidal waters include bays, ponds, streams, and freshwater, brackish, and salt marshes. Non-tidal waters include marshes, ponds, streams, and swamps. See maps 3-13 through 3-15.

Terrestrial Habitats

Forests compose more than 90 percent of Wertheim's uplands. The most common forest types include conifer plantations, mixed oak, oak/pitch pine, pioneer hardwood, pitch pine, red cedar, and red maple. The refuge is located on the periphery of pine barrens, an uncommon forest type in the state. Wertheim was designated as a Core Preservation Area within the Central Pine Barrens in 1998. Figure 3.1 shows the proportion of terrestrial habitats at Wertheim.

Forested wetlands are dispersed among the upland woods and along the four tributaries of the Carmans River. Shrub wetlands, forested flood plains, and a small number of emergent wetland fringes bound those creeks. Forested wetlands also occur along the upland forest and salt marsh edge. On the eastern portion of the Carmans River, where the proposed headquarters and visitor center would be located, the site best fits the description of a maritime oak forest by Reschke (1990), grading into a red maple swamp in the westernmost portions adjacent to the river.

The overstory of that site is a closed-canopy (at least 75 percent canopy cover), small, sawtimber-sized stand in second growth forest. The dominant tree species are red oak, black oak, and white oak with subdominant black cherry and white oak. Scattered pitch pines are present but uncommon. In the western portion of the proposed site, closest to the Carmans River, soils are wetter and pole-sized red maple dominates the overstory.

The understory in the site is moderately dense (over 50% ground cover) with most shrubs being less than 1 m tall. Dominant species were high bush blueberry, black huckleberry, low bush blueberry, black cherry, common greenbrier, and dewberry. Other species that are present include Virginia creeper, white oak, sassafras, arrowwood, poison ivy, and currant. In the wetter soils closer to the river sweet pepperbush is a dominant species.

Grassland and forest openings are permanent herbaceous openings like forest meadows or fields. Twenty-four openings contain approximately twenty acres of grassland developed or maintained as warm or cold season grassland. Herbaceous openings help maintain the diversity of upland habitats at Wertheim.

Wildlife consistently use these forest openings. They provide brood habitat for wild turkeys and other gallinaceous birds, herbaceous forage for grazers, and nesting habitat for eastern bluebirds and some species of waterfowl. Their use by white-tailed deer and bobwhite quail is high, particularly where legumes dominate. American woodcocks commonly use 13 of the forested fields as their spring singing

and roosting grounds. In June and early July, eastern box turtles extensively use the forest openings. Sharp-shinned hawks and Cooper's hawks can frequently be observed during their spring and autumn passages.

Mixed oak forests occur on more than 600 acres at Wertheim. Canopy dominants include black, white, and red oaks - all three of which exist in most stands along with hickory. Several blueberry species and black huckleberry make up the understory of a mixed oak forest, although green briar and black cherry are also common.

Oak/pitch pine forests are an intermediate between the previous two types and have understories similar to the mixed oak type.

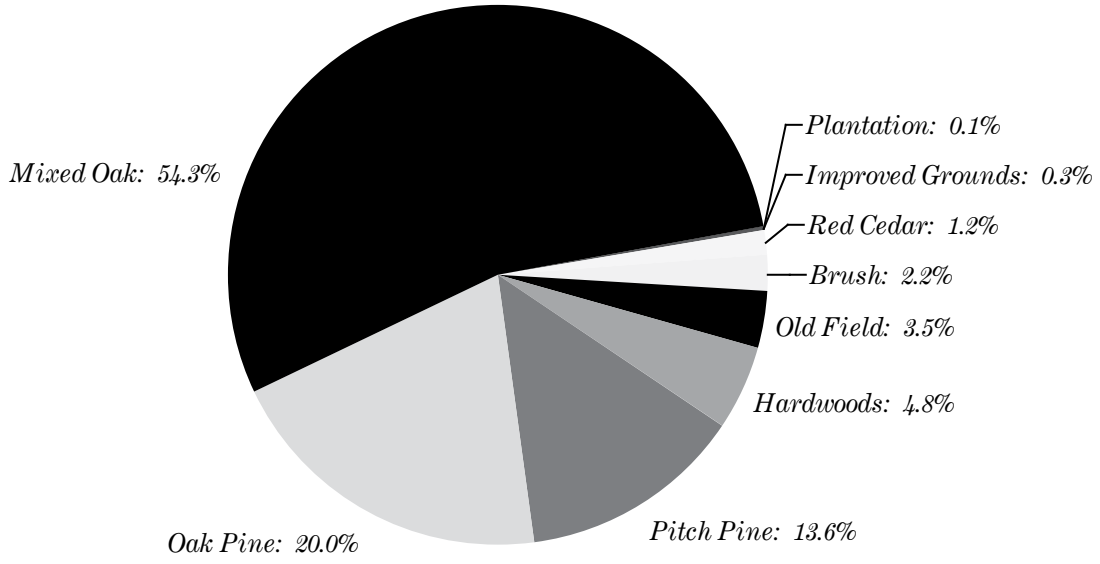
Pitch pine forests occur on 150 acres and are principally located on sandy soil types. Mature pitch pine stands exhibit the sparsest woody understory of any forest type at Wertheim.

Red maple forests occur on more than 200 acres and are mainly associated with wetlands. Dominants include red maple and tupelo. Red maple forests have the most robust understory of all the other forest types.

Wetland Habitats

Several large salt marshes covering several hundred acres border the Carmans River and its tributaries. Approximately 40 percent of the aquatic habitats at Wertheim consist of salt marsh and marine waters situated principally along the lower Carmans River and Bellport Bay. Another 40 percent consists of freshwater and brackish rivers, streams and marshes. Swamps and shrub swamps make up the remaining 20 percent.

Figure 3.1. Terrestrial habitats at Wertheim



The refuge maintains some of its salt marshes as open marsh water management areas. Wertheim has more than thirty miles of drainage ditches put in by Suffolk County Vector Control in the 1950's as a mosquito control measure. These ditches, located in salt and brackish marshes, destroyed pannes and backwater habitats. By plugging these ditches, the refuge has restored pannes habitats and salt marsh hydrology, and thereby provided excellent habitat for fish and wildlife.

Wertheim has five impoundments each with some degree of water level control: Big Fish Creek Impoundment, sub-impoundment, Pine Pond, Little Neck Run Pond and Owl Pond. Four of those are fewer than 10 acres, and three have fixed pipes that maintain a constant water level except during certain periods in summer. Big Fish Creek impoundment and the sub-impoundment have water control structures with flash boards.

The 40 acre Big Fish Creek Impoundment is centrally located on the refuge. Half of the impoundment consists of open water with associated submerged aquatic vegetation, and the other half consists of robust emergents. The 7 acre sub-impoundment constructed adjacent to it in 1989 is 33 percent forested wetland, 34 percent shrub swamp, 21 percent robust emergent divided between cattail and great reed, and 12 percent open water.

Aquatic Habitats

Wertheim is bisected by the Carmans River, a state-designated Wild and Scenic River. It is the second-longest brackish river on the island, and the focal point of the refuge. Approximately 3 miles of the river and the complex of salt marshes adjacent to it is located in the refuge. Yaphank Creek, Little Neck Run, Big Fish Creek and Little Fish Creek all join the Carmans River within Wertheim boundaries, and are described as freshwater tidal tributaries. The river and stream banks are heavily covered with *Phragmites*. The refuge aquatic habitats include a marine bay, tidal river, freshwater streams, ponds, salt marsh, brackish and freshwater marsh, red maple swamps and shrub swamps. The refuge protects one of the last undeveloped estuary systems remaining on Long Island.

USFWS

Carmans River at Wertheirm.

Fish and Wildlife

Wertheim hosts nearly 500 vertebrate species and roughly 500 species of vascular plants. The refuge encompasses many of the vegetation types on Long Island, thereby providing habitat for a variety of wildlife ranging from forest interior nesting, Neotropical migrant birds to marine mammals. The coastal location of

U.S. Fish & Wildlife Service

Map 3-13

Wertheim National Wildlife Refuge

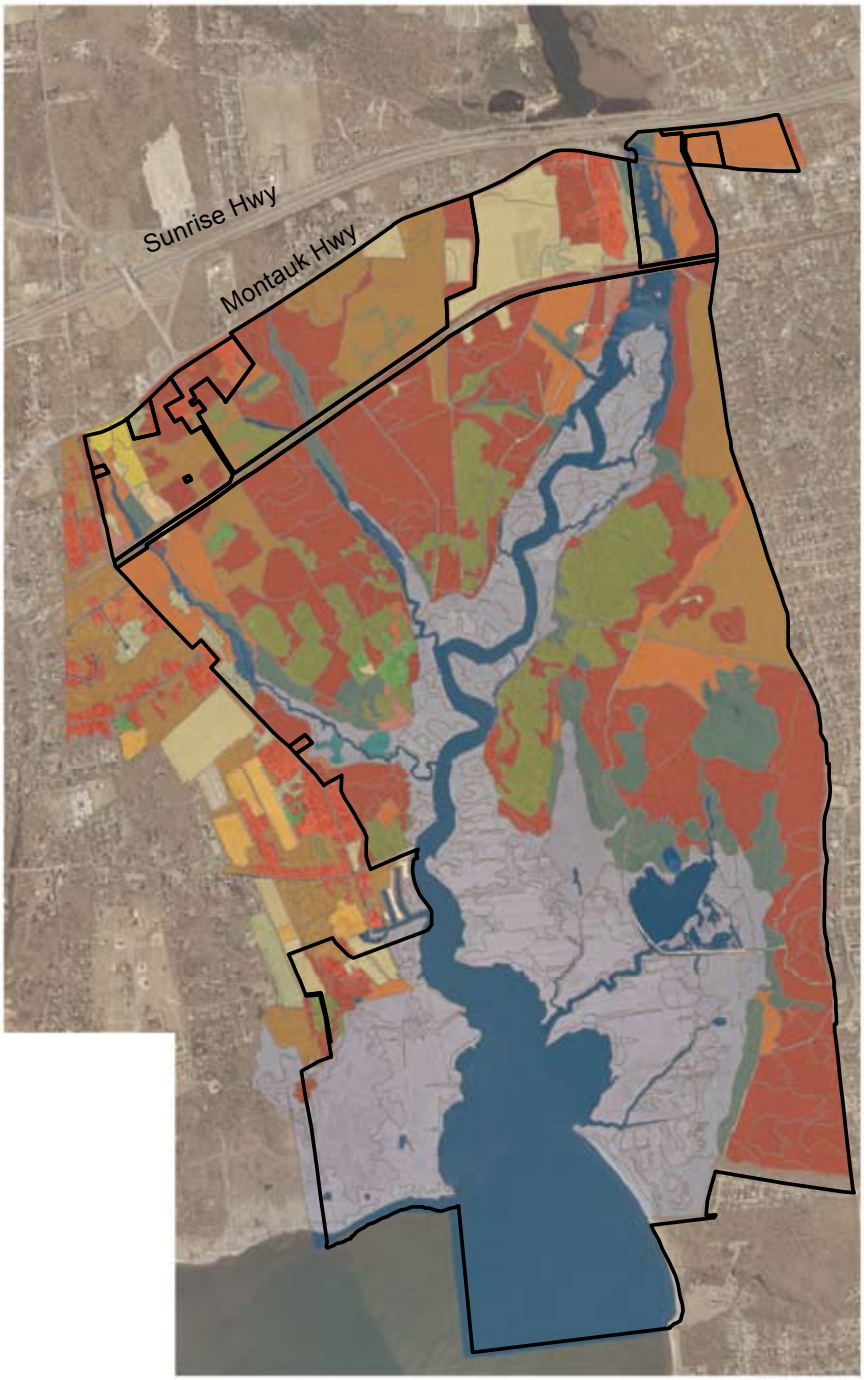
Suffolk County, New York

Vegetation Cover Map

- Refuge Boundary (2,572 Acres)
- Water
- Marina
- Residential, Urban, Developed
- Inland Pool
- Paved Road
- Railroad
- Sand/Dirt Road

Vegetation Cover

- Row Crop
- Old Field
- Mature Old Field
- Old Field/Autumn Olive
- *Prunus serotina-Amelanchier canadensis-Fagus grandifolia-Quercus spp.* forest alliance
- *Smilax glauca - Toxicodendron radicans* vine- shrubland
- *Typha angustifolia - Hibiscus moscheutos* Herbaceous Vegetation
- *Phragmites Australis* Tidal Herbaceous Alliance
- *Spartina patens- Distichilis spicata - Plantago maritima* herbaceous vegetation
- *Juniperus virginiania-Myrica pennsylvanicum* woodland (Trees generally less than 4m)
- *Quercus Velutina - Quercus Alba - (Quercus Coccinea)* Forest Alliance
- *Quercus (alba, rubra, velutina) / Cornus florida / Viburnum acerifolium* Forest
- *Quercus coccinea - Quercus velutina / Sassafras albidum / Vaccinium pallidum* Forest
- *Pinus rigida - Quercus coccinea / Vaccinium pallidum - (Myrica pensylvanica)* Forest
- *Acer Rubrum - Nyssa Sylvatica Saturates* Forest Alliance



Produced by Long Island NWR Complex, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

1:31,587

0 0.5 1 Miles

0 0.5 1 1.5 Kilometers

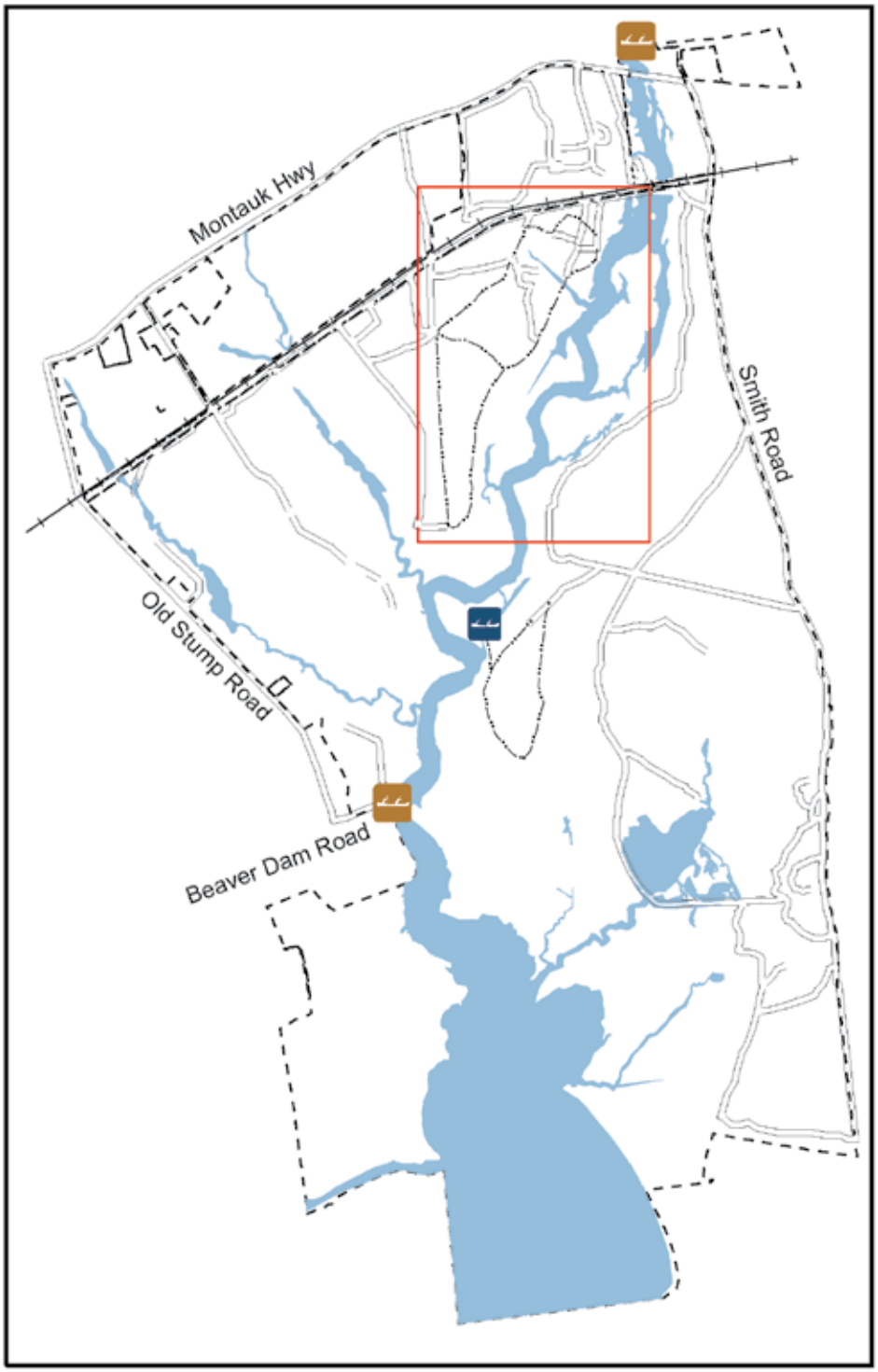
N W E S

U.S. Fish & Wildlife Service

Map 3-14

Wertheim National Wildlife Refuge
Suffolk County, New York

Boat Launch and Fishing Access Sites



Refuge Boundary (2,572 Acres)

See Map 3-15

Nature Trails

Access Road

Railroad

Water

Trail Access via Canoe/Kayak

Shore Fishing Access, Canoe/Kayak Launch

1:28,047

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 2.5 Kilometers

N W E S

Produced by Long Island NWR Complex, Shirley, New York
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

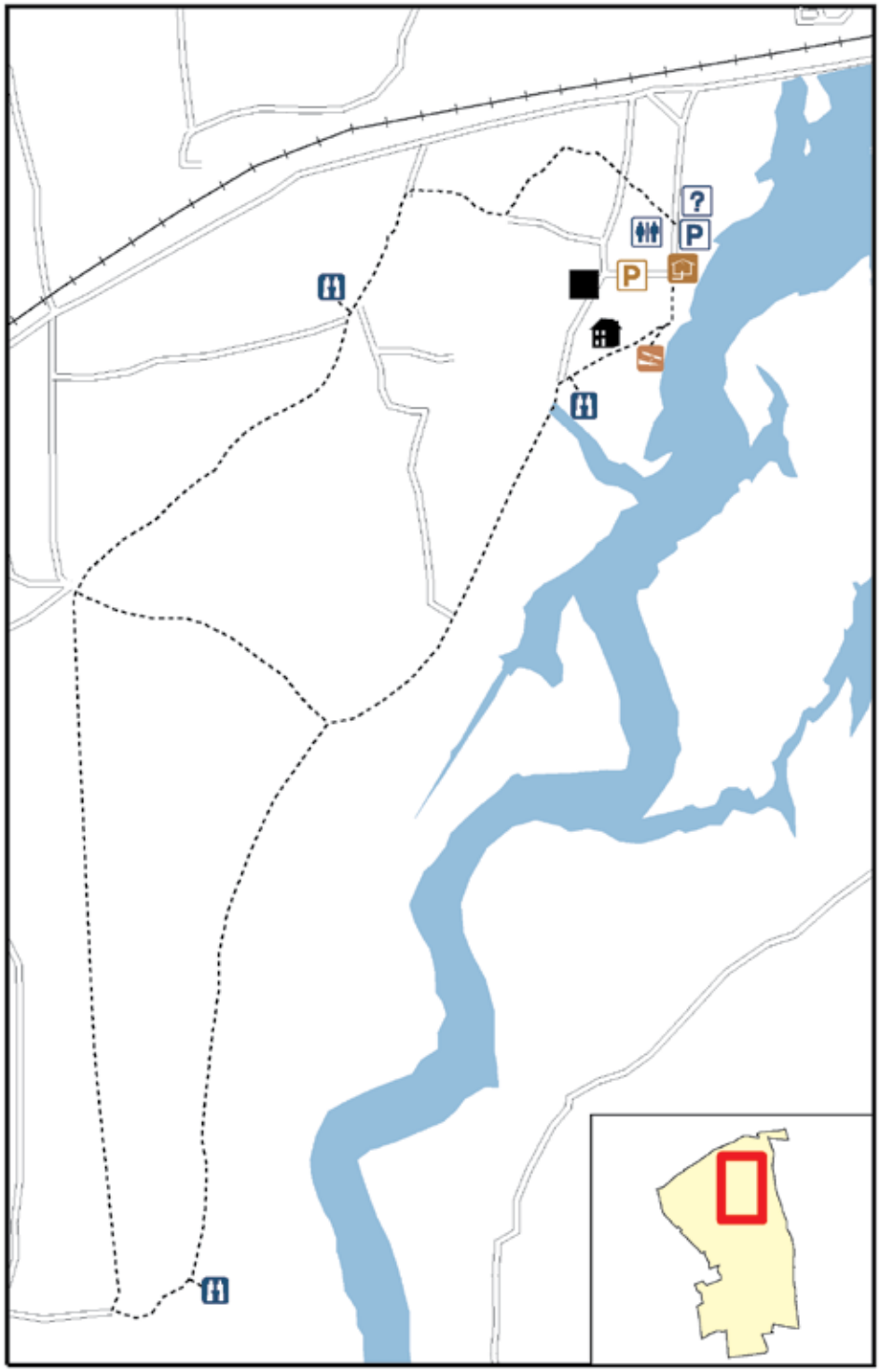
U.S. Fish & Wildlife Service

Map 3-15

Wertheim National Wildlife Refuge

Suffolk County, New York

Facilities and Trails Map



- Information Kiosk
- Visitor Parking Lot
- Employee Parking Lot
- Observation Blinds and Platforms
- Maintenance Facilities (3) and Storage Buildings (2)
- Refuge Housing
- Headquarters and Refuge Offices (2)
- Restroom
- Employee Dock (No Public Access)
- Access Road
- Railroad
- Nature Trails
- Carmans River

1:7,500

0 0.1 0.2 0.3 Miles

0 0.2 0.4 0.6 Kilometers

N W E S

Produced by Long Island NWR Complex, Shirley, New York
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

the refuge also makes it part of a major migration corridor for a variety of birds including waterfowl, waterbirds, raptors, and songbirds. Avian species are the largest single class of vertebrates at the Complex, with more than 200 bird species having been documented at Wertheim.

Birds

Raptors.—The coastal location of the refuge makes it an important migratory area for certain raptor species, in particular the northern harrier, osprey, peregrine falcon, sharp shinned hawk, Cooper's hawk, kestrel, merlin, saw whet owl, and short eared owl. Common nesting raptors include osprey, northern harrier, red-tailed hawk, great horned owl, and screech owl. Bald eagles are observed during fall migration, and immature eagles over-wintered at the refuge in 2003 and 2004.

Waterfowl.—Waterfowl use is extensive and the refuge serves as important wintering habitat for waterfowl between October and March. Principal species include black duck, greater scaup, bufflehead, gadwall, and red-breasted merganser. Green-winged teal are abundant during migration. Wood ducks are prolific nesters, while each year, black ducks and mallards rear several broods, as well.

Waterbirds, Shorebirds, Gulls, Terns and Allied Species.—Waterbird use is common with peak periods for long-legged wading birds, terns, shorebirds and other waterbirds occurring in the warmer months. Nine species of herons, egrets and ibises are commonly observed on the refuge. Great blue herons, snowy egrets, green-backed herons, and great egrets are most common, with great blue herons present year-round. The number of long-legged wading birds peaks in August and there is a smaller peak earlier in April. American bitterns, a state-listed species of special concern, are present in the winter.

Herring, great black-backed, laughing, and ring billed gulls are commonly observed at the refuge. Herring gulls are the most common, and are present year-round. Great black-backed gulls are the next most common species.

Other marsh and waterbird species observed on the refuge include the double-crested cormorant, common loon, pied-billed grebe, sora, and belted kingfisher.

Least and common terns are observed on the refuge from May through August. Other shorebirds observed include greater yellowlegs, least sandpiper, black-bellied plover, killdeer, spotted sandpiper, short-billed dowitcher, semi-palmated sandpiper, dunlin, and willet. Shorebird numbers peak in August, but high numbers are also present in the months of May, July, and September.

Other Migratory Birds.—Songbirds are a conspicuous component at Wertheim and a major attraction for many of the visitors. The songbird community is diverse and includes many Neotropical migrant species. Dominant breeding songbirds of forested habitats include ovenbird, American redstart, yellowthroat, catbird, rufous-sided towhee, great crested flycatcher, eastern wood peewee, blue jay, Carolina wren, wood thrush, red-eyed vireo, pine warbler, northern oriole, northern mockingbird, and brown thrasher.

Dominant breeding songbirds of shrub and grassland habitats include the song sparrow, tree swallow, yellow warbler, mockingbird, barn swallow, house wren, northern cardinal, and American goldfinch. Breeding birds of tidal wetlands are dominated by the sharp-tailed sparrow, marsh wren, song sparrow, seaside sparrow, red winged blackbird, and the tree swallow. The refuge also provides important stop-over habitat during migration for many species using the coastal migration corridor. Prominent winter songbirds at the refuge include the white throated sparrow, dark eyed junco, black capped chickadee, white breasted nuthatch, tufted titmouse, northern cardinal, and blue jay. Purple finch, evening grosbeak, red crossbill, and pine siskin use the refuge extensively in periodic hard winters.

Reptiles and Amphibians

Approximately 30 species of reptiles and amphibians occur at the refuge. Dominant freshwater reptiles include the eastern snapping turtle, eastern painted turtle, spotted turtle, and the northern watersnake. The dominant reptile of tidal habitats is the diamondback terrapin. Eastern box turtle, black racer, eastern milk snake, eastern ribbon snake, and the common garter snake are the dominant reptile species of terrestrial habitats. Eastern box turtles and eastern hognose snakes are of interest because of the perceived current decline of these species on Long Island where both were once considered abundant and dominant species.

Common amphibians include red-backed salamander, bullfrog, green frog, wood frog, Fowlers toad, and spring peeper.

Mammals

Approximately 30 species of mammals have been documented at the refuge. White-tailed deer, eastern cottontail, gray squirrel, red fox, eastern chipmunk, and muskrat are commonly observed. Harbor seals are the most common marine mammal, although irregular in occurrence at the refuge. Bats compose about a quarter of the mammalian species and the little brown bat, big brown bat, eastern pipistrelle, and the red bat are the most common.

Fish

The refuge possesses a diversity of aquatic habitats ranging from marine to freshwater and tidal to non-tidal as well as stream and pond habitats. The fish community reflects this diversity of habitats. Salt marshes support an interesting array of killifish species, bays provide seasonal habitat for many important commercial marine species, tidal rivers and streams support both catadromous and anadromous species, freshwater streams serve as trout habitat, and ponds and impoundments support warm water fisheries. Dominant species include American eel, Atlantic silversides, summer flounder, pumpkinseed, blueback herring, alewife, banded killifish, sheepshead minnow, striped bass, winter flounder, and bluefish. The presence of sea-run or “salter” brook trout in Yaphank Creek is a unique occurrence on Long Island.

Rare, Threatened or Endangered Species

Federally designated endangered or threatened species occur at Wertheim intermittently, but do not use the refuge in the breeding season. They include roseate tern, bald eagle, and the loggerhead sea turtle. State-listed endangered or threatened species at Wertheim—not already listed by federal authorities—include golden eagle, peregrine falcon, black rail, and king rail; black, common, and least tern; and short-eared owl, loggerhead shrike, pied-billed grebe, least bittern, northern harrier, upland sandpiper, sedge wren, and eastern mud turtle (USFWS 1995, NYSDEC 2003). The tiger salamander, northern cricket frog, Hessel's hairstreak, and frosted elfin are state-listed threatened and endangered species whose presence at Wertheim is likely, but unconfirmed (USFWS 1995). Page 3-12 details some of the habitat preferences of the species listed above. Table 3.3 lists species of special concern at Wertheim. Refer to appendix A for a complete species list.

Table 3.3. Species of Special Concern at Wertheim

common loon	(*Gavia immer*)
American bittern	*(Botaurus lentiginosus)*
osprey	*(Pandion haliaetus)*
sharp-shinned hawk	*(Accipiter striatus)*
Cooper's hawk	*(Accipiter cooperii)*
northern goshawk	*(Accipiter gentilis)*
red-shouldered hawk	*(Buteo lineatus)*
black skimmer	*(Rynchops niger)*
common nighthawk	*(Chordeiles minor)*
whip-poor-will	*(Caprimulgus vociferous)*
red-headed woodpecker	*(Melanerpes erythrocephalus)*
horned lark	*(Eremophila alpestris)*
golden-winged warbler	*(Vermivora chrysoptera)*
cerulean warbler	*(Dendroica cerulea)*
yellow-breasted chat	*(Icteria virens)*
grasshopper sparrow	*(Ammodramus savannarum)*
seaside sparrow	*(Ammospiza maritima)*
vesper sparrow	*(Pooecetes gramineus)*
spotted turtle	*(Clemmys guttata)*
eastern box turtle	*(Terrapene carolina)*
worm snake	*(Carphophis amoenus)*
eastern hognose snake	*(Heterodon platyrhinos)*
eastern spadefoot toad	*(Scaphiopus holbrooki)*
southern leopard frog	*(Rana sphenocephala)*

History and Cultural Resources

Early History

The Unkechaug Indians were one of the 13 tribes making up the Long Island confederacy. They had a population of 6,500 at the time of the first white settlement in 1635. The Unkechaugs, Poosepatucks, Shinnecock, and Montauk tribes continued to live in communities that in time became reservations (Borg and Shreeve 1974).

The first white settlers came to Suffolk County, Long Island in 1635. They were of English origin and crossed Long Island Sound from colonies in Massachusetts and Connecticut. Early occupations included whaling, grist and saw milling, fulling, ice harvesting, salt haying, duck hunting, and fishing (Borg and Shreeve 1974).

The whaling industry began in 1667 when settlers agreed to pay the Unkechaugs for every whale they delivered. The Carmans River was important for shore-based whaling crews as well as small coastal trading vessels.

Recent History

By the 1940s, villages and hamlets dominated Nassau and Suffolk Counties and aviation and agriculture prevailed as industries. In the 1950s and '60s people moved their families to Long Island and transformed the villages and hamlets into suburban sprawl. Over the past 50 years, the population of Nassau and Suffolk Counties more than tripled to 2.6 million.

It is interesting to note that adjacent to Oyster Bay National Wildlife Refuge is the Sagamore Hill National Historic Site, operated by the National Park Service. With over 40,000 visitors per year, Sagamore Hill is an 83-acre site that was the home of Theodore Roosevelt, 26th President of the United States, from 1885 until his death in 1919. From 1902 to 1908 his "Summer White House" was the focus of international attention. Theodore Roosevelt is also credited as the founder of the National Wildlife Refuge System when he designated Florida's Pelican Island as the first refuge in 1903.

Archaeology and Historic Structures

The USFWS Region 5 archeologists have conducted several small surveys at the Complex, but no comprehensive survey has been done of the Complex's individual refuges. One structure, the L-Shaped Barn, at Seatuck has been designated as historic on the National Register of Historic Places. No other structures at the Complex have been listed on the Register. The Complex does possess several small historic cemeteries which are protected from disturbance.

Museum Property

The Department of the Interior identifies several major categories of museum property: archaeological collections, ethnographic materials, art, documents which are not official records as defined by the National Archives, historical objects related to the Service, environmental samples, and botanical, geological, zoological, and paleontological collections (USFWS 1997). A Museum Property Survey identified five items of museum property at the Complex: one historical object each at Morton and Seatuck, and three zoological items at Wertheim.

Socioeconomic Environment

Refuge Contributions to the Local Economy

Refuge Revenue Sharing

The Complex contributes directly to its local economy through revenue sharing payments. The Federal Government does not pay property tax on refuge lands, but instead, pays refuge revenue sharing to local taxing authorities based on a maximum of three-quarters of 1 percent of the fair market value of refuge land, which is determined by an appraisal every 5 years. The actual amount distributed each year varies by the amount of congressional appropriations. Please refer to appendix B for more information. That amount also changes as we acquire new lands. Table 3.4 shows the amounts the Complex contributed to Nassau and Suffolk counties between fiscal years 2000 and 2004.

Table 3.4. Refuge revenue sharing payments from the Complex to Nassau and Suffolk counties.

Year	Total Paid to Nassau County*	Total Paid to Suffolk County**
2000	$1,222	$184,637
2001	$1,247	$287,816
2002	$993	$256,539
2003	$1,120	$287,386
2004	$990	$255,831

*Includes Oyster Bay refuge.
**Includes Amagansett, Conscience Point, Morton, Seatuck, Target Rock, and Wertheim refuges.

Public Use

The public use program at the Complex focuses on wildlife-dependent recreation, including environmental education, nature interpretation, wildlife observation, photography, and fishing. Public relations and outreach are also a significant part of our public use program. Map 4-1 in chapter 4 features public use opportunities available at each refuge. Additional maps in this chapter show the locations of facilities and nature trails available at refuges that are open to public use.

Environmental Education

Suffolk and Nassau counties contain 129 public school districts with roughly 30,000 teachers and about 390,000 students. We estimate an average of 5,000 students visit Wertheim, Target Rock, and Morton each year. Approximately 3,000 students canoe the Carmans River at Wertheim each year. The potential is tremendous for increasing the number of environmental education users. School and scout groups account for 90 percent of the requests for refuge-staff-guided programs.

Teachers use Morton, Target Rock and Wertheim refuges, and historically used Lido Beach, where teacher workshops and school programs frequently were conducted by the Sealink Environmental Center, Long Beach School District. The potential for rekindling interest in Lido Beach is great, and that goal is attainable.

In the past, our outdoor recreation planner worked closely with local school teachers in teacher workshops and by individual appointment to empower teachers to guide their own class trips on the refuges open for environmental education. A teaching-about-wetlands workshop developed for Wertheim was well received by teachers and scout leaders, and served as a test case for developing similar workshops at other refuges in the Complex. Local teachers are now testing similar packets drafted for teacher-guided environmental education programs. The outdoor recreation planner position is currently vacant.

The Friends of the Bay and The Waterfront Center are promoting marine environmental education programs for schools as well as for the public in the Oyster Bay area. The Complex has been invited to participate in teacher workshops, guided programs, exhibits about Oyster Bay, and literature. Our staff continues to work with those partners to promote stewardship and appreciation for Oyster Bay.

Interpretation

Fourteen million people live within a 2-hour drive of the Long Island refuges. Even with little media coverage, the Complex still receives nearly 500,000 visitors per year. Staff-guided interpretation programs are given on request, when time permits. Wertheim, Target Rock, and Morton now offer self-guided trails. In 2001, much work was done to improve interpretation on the Complex, and continues today. Three new brochures became available to the public in 2001: bird, mammal, and general. A reptile and amphibian brochure, a Target Rock trail guide, and a Morton trail brochure were developed in 2003. Our staff directed much of its energy toward Target Rock, improving its trail surface for safety and ease of walking, relocating the trail head and developing a new trail guide, updating the information kiosk with new interpretive signs, and adding an overlook where visitors can stop to view Huntington Bay.

Refuge staff also improved the Wertheim trail, resurfacing it and making a 1-mile portion barrier-free, and adding SoundPost panels that give audio information at the touch of a button. New interpretive signs also update the information kiosk, and the new trail guide is an effective tool for the public and educators.

B. Stewart/USFWS

Environmental education activity at Wertheim.

Similarly, trail work at Morton involved renewing the surface and creating a barrier-free section leading to the refuge beach and ending in a deck or observation platform. A new trail guide and updated interpretive signs accompany our plans now underway to create a demonstration garden of native plant species.

The Complex lacks a visitor center. However, a visitor center has been

proposed and was evaluated as recently as 2001. We continue to plan for the development and completion of a visitor center with refuge headquarters. See chapter 4 and appendix G for details.

Wildlife Observation and Photography

Visitors enjoy observing wildlife by using the nature trails and beaches at Morton and Target Rock. Observation at Wertheim offers the use of nature trails, the refuge entrance road, and canoeing or kayaking the Carmans River. Observation and photography blinds help visitors get a better view and minimize the disturbance of wildlife. Wildlife photographers may obtain special use permits to photograph wildlife in closed areas on the refuges. Traditionally, permitted photographers have allowed the Complex to use their images free of charge in its publications and audio/visual programs, and have become important partners.

Hunting and Fishing

Currently, public waterfowl hunting is not allowed on any of the Complex refuges. Biologists conducted an environmental assessment to investigate the possibility of hunting the overabundant white-tailed deer at Wertheim. That was approved, and began in the fall 2005.

Long Island holds the majority of New York's wintering waterfowl. Tens of thousands of ducks and geese of at least 28 species are available to Long Island's waterfowlers. The various seasons run from early September through early March. Most waterfowlers hunt on the tidal marshes, bays, and creeks along the shore. In years when the Atlantic Flyway Council approves the liberal alternative for New York, the state offers a long season of approximately 105 days, a 6-bird daily bag limit for most species, and a 7-bird daily limit to those hunting scoters, eiders and long-tailed ducks in Long Island Sound and the Peconic Bays. The seasons or limits are reduced when the council approves the moderate, restrictive, or very restrictive alternatives for the state.

Many duck hunters pursue the dabbler species, particularly black duck, with mallard, pintail, widgeon, gadwall and green-winged teal making up most of the harvest. Hunters that seek the diving duck species generally set for bluebills like the greater scaup, and typically encounter a variety of other open water species, including bufflehead, goldeneye and redhead. Canada geese and brant are popular in the western bays of the south shore.

Most tidal areas are publicly owned, and can be hunted without special permission; however, access is often difficult. The successful hunt generally requires a seaworthy grassboat well-camouflaged with salt hay, or a scooter painted to resemble waves or ice for open bay bluebill rigs. For the hunter willing to scout, some good freshwater shooting for puddle ducks can still be found in eastern Suffolk County. The eastern portion of the county also provides excellent goose-shooting from leased lands or guided blinds. Regulations are subject to change, and hunters should consult the regulations for the current year for restrictions on certain species.

The Suffolk County Department of Parks, Recreation, and Conservation offers waterfowl and deer hunting programs in some of its parks. The county waterfowl

program at South Haven County Park is especially geared toward the novice waterfowl hunter. The National Park Service permits waterfowl hunting from the Fire Island National Seashore.

Special access permits are required for all of these controlled hunting areas. Private lands are often posted; however, with some work, open areas can be found. In all cases, every hunter should obtain landowner permission before hunting on any area. As Long Island becomes increasingly developed, the resulting loss of habitat will continue to take its toll on wildlife and hunting opportunities.

Migratory game bird seasons are set based on five migratory game bird hunting zones that have been approved by the Service. All dates listed are tentative until we adopt the Final Federal Frameworks for migratory game bird hunting regulations in late summer. All New York waterfowl hunters are required to register for the Harvest Information Program. The HIP is a federally mandated program used solely to survey migratory game bird hunters.

Fishing is permitted on the Carmans River at Wertheim, from the beaches of Morton, Target Rock, and Amagansett, and at Oyster Bay. Table 3.5 lists information about fishing opportunities at the Complex. Fishing licenses are not required, because these waters are considered to be tidal waters. The exception is Mill Neck Pond at Oyster Bay, where a state fishing license is required. New York State regulations governing creel and size limit of fin fish and shellfish are in effect at all Complex refuges for species such as striped bass, fluke, flounder, weakfish, and other sport fish. Recreational and commercial trapping are not permitted on any of the refuges.

Table 3.5. Fishing information and opportunities at the Complex.

Refuge	*Anglers per Year	Nearest Highway	Comments	Available Fish Species
Amagansett	180	Montauk Hwy., 27A, 80	Shore access. Parking on town property only; a permit may be required.	Striped bass, weakfish, Atlantic mackerel, flounder.
Morton	50	Hwy. 27	Shore access. Trails and portions of beach closed April 1–mid-August.	Striped bass, weakfish, Atlantic mackerel, flounder, bluefish, tautog, ling, eel blowfish.
Oyster Bay	50,000	Long Island Expressway	Access from town launches or Long Island Sound.	Striped bass, weakfish, Atlantic mackerel, flounder, bluefish, spotted seatrout.
Target Rock	500	Hwy. 110	Shore access. Good access roads.	Striped bass, weakfish, blackfish, Atlantic mackerel, flounder.
Wertheim	2,500	Hwys. 27, 46, 80	**Riverbank and boat access.	Striped bass, weakfish, brown trout, brook trout, rainbow trout, carp, largemouth bass, white perch.

*Estimated average number of anglers per year.
**Canoe, kayak and shore access to the Carmans River available at the fishing access site on Montauk Hwy Rt.27A/ CR 80. Fishing from riverbank permitted year-round between the Sunrise and Montauk Highways, and Squassux Landing at the end of Beaver Dam Road in Brookhaven. Fishing from a boat is permitted anywhere except on Big Fish Creek Pond.

Public Relations

Each year, Long Island receives an estimated 26 million visits, and the Complex receives an estimated 500,000 visits. We issue 6 to 12 news releases annually to 25 local and regional newspapers, radio, and television media, and invite them to the refuges when newsworthy events occur. *News 12 Long Island* broadcasts from one to three stories about the Complex each year.

Complex staff will present onsite programs to organized groups at Wertheim, Morton, and Target Rock on request when staff time permits. Offsite programs are conducted in Suffolk and Nassau Counties in association with various government and non-government organizations. Most of those programs are family- or education-oriented.

The political climate is very dynamic in the heavily populated area around the Complex. The refuge manager and staff work diligently year-round to maintain open lines of communication with concerned citizens, local, state, and federal politicians. Our outreach includes meetings in person, conference calls, letters and publications, and attending special events.

Non-Wildlife-Dependent Recreation

Wertheim and Oyster Bay accommodate canoeing, kayaking, and row boating. Private boat rentals do business near both refuges. Approximately 9,000 canoeists visit the Carmans River each year. Boat rentals at Oyster Bay are assumed to number in the hundreds.

Many non-wildlife-oriented recreational uses are not permitted on national wildlife refuges. Activities generally not permitted or encouraged include camping, picnicking, swimming, using off-road vehicles, power boating, house boating, surfing, waterskiing, jogging, bicycling, horseback riding, and operating concessions. However, an occasional exception may be permitted.

The Complex has the authority to regulate the Town of Brookhaven docks at Squassux Landing Marina on the Carmans River at Wertheim, where the docks extend into the refuge. The U.S. Coast Guard considers both areas navigable waters.

Socio-Political Climate

We based the following information on information obtained from the New York State Office of Parks and Recreation (2003). The type of recreational facilities provided by different types of operators or owners varies considerably. Those differences usually are based on geography, the activity, and the provider.

Federal

The role of the Federal Government in directly providing recreational resources in New York State is fairly limited; it provides less than 5 percent of the recreational acreage and less than 1 percent of the recreational sites. A major element of the federal recreation program is to assist localities through its various programs, rather than maintain and operate federal facilities. Nevertheless, the Federal Government does maintain recreation areas owned and managed by a number

of different agencies: the National Park Service, U.S. Forest Service, U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service.

One of the most notable federal sites on Long Island is the Fire Island National Seashore, only 1 hour east of New York City. The opportunities it offers include 32 miles of sandy beaches, a "sunken" forest of 300-year-old holly trees, hiking trails, saltwater marshes, New York State's only federally designated wilderness, and one of the tallest lighthouses in the United States. Tours are also available in the home of William Floyd, one of Long Island's signers of the Declaration of Independence. State-, county- and town-owned public beaches on Fire Island provide additional opportunities for recreation. The Sailors Haven and Watch Hill units depend on water travel, and generally are open from mid-May through mid-October each year. The Fire Island Light Station, the William Floyd Estate and the Fire Island Wilderness Visitor Center at Smith Point are accessible year-round, but operating hours vary by season.

State

The State fulfills its role as a recreation provider in a number of ways. It coordinates with the Federal Government, maintains its own recreation facilities, and works with localities in providing recreational amenities. The two state agencies that provide the most significant recreational opportunities are the Office of Parks, Recreation and Historic Preservation and the Department of Environmental Conservation. Also, the Central Pine Barrens Joint Planning and Policy Commission is a State-designated agency partner with jurisdiction within the Central Pine Barrens area.

Local

Local government provides the greatest number of recreation sites but not the largest acreage. Together, county, town, village governments and school districts operate about 44 percent of the more than 14,000 recreation sites and about 7 percent of the recreational acreage in the state. The Suffolk County Parks Department manages more than 42,000 acres of parkland offering many leisure pursuits. The park system offers such popular activities as golfing, camping, horseback riding, swimming, hiking, fishing, boating, taking part in outer beach activities, or visiting local historic sites.

Local attitudes about the Complex vary, but most of the public is favorably disposed toward our mission of protecting and preserving wildlife and their habitats on Long Island. A sizeable segment of the public demonstrates their interest in protecting natural resources by visiting the refuges and other natural areas on Long Island. A vocal segment is also interested in limiting future development on the wildlands remaining on Long Island. Potentially controversial issues involve white-tailed deer, wildlife-dependent recreation, and mosquito control.

Refuge Complex Administration

Staffing and Budget

Highly variable annual budget appropriations commensurately affect our staffing levels. Table 3.6 summarizes our budget and staffing levels from 1997 to 2005. Fluctuations reflect funding for special projects, moving costs for new employees, or large equipment purchases. Most of the funding is earmarked; very little discretionary funding is available.

Table 3.6. Budget and Staffing Levels between 1997 and 2005

FY	Operations	Maintenance	Full time	Seasonal	Term
1997	$700,300	$197,500	10	2	0
1998	827,300	170,000	10	3	0
1999	770,800	101,900	12	1	0
2000	761,800	254,000	12	3	0
2001	838,900	303,000	13	2	0
2002	830,000	492,700	11	2	1
2003	1,044,287	557,249	12	0	0
2004	1,054,592	156,593	12	0	0
2005	944,125	248,820	12	0	0

Land Acquisition

Because of the limited number of undeveloped tracts in the vicinity of the refuges, we are not planning any major refuge expansions. Reduced land acquisition funding and escalating land prices have also made it difficult for the Service to undertake large preservation efforts, especially on Long Island. We will continue to consider minor acquisitions that lie next to existing refuges and are biologically important or provide connections with other lands protected by our conservation partners. We will deal with those situations as they arise. Additionally, our partnerships with organizations such as the Central Pine Barrens allow us to participate in initiatives to designate and preserve habitat and open space beyond the boundaries of our refuges.

Resource Protection and Visitor Safety

The nine refuges of the Complex are situated over approximately 100 miles of Long Island, stretching from Lido Beach easterly to Amagansett. The Complex headquarters at Wertheim is located in Suffolk County, which has a population of 1.5 million people and lies within a 1 hour commute of New York City. Target Rock, Wertheim, Oyster Bay, Amagansett, and Morton refuges are open to the public, and average approximately 500,000 visitors annually. Conscience Point, Seatuck, Sayville, and Lido Beach refuges are closed to public visitation, but are accessible by special use permit for research and environmental education. Target Rock and Morton refuges are also part of the Federal Fee Demonstration Program.

Since 1999, the Complex law enforcement staff has been limited. Before the station law enforcement program consisted of two collateral duty officers. As a result of the minimal number of officers and the long distances between refuges, many violations go undetected or unreported. In the past 7 years, the Complex averaged more than 500 reported incidents and over 30 violation notices per year. Most of those typically involved trespassing, the illegal use of ATVs, unleashed dogs, dumping, or vandalism.

Because the Complex is close to densely populated areas, it is also susceptible to such criminal activities as burglary, prostitution, drug manufacturing and use, disorderly conduct, violence, and one case of assault on a federal officer, resisting arrest and evading police. Numerous building break-ins resulted in the theft of government property or vandalism. The Suffolk County Police Department made three felony arrests for burglary or the illegal use of a rifle at the Complex, and investigated three violent crimes. Wildlife-related violations include poaching, wildland arson, and disturbance of plants or animals. Poaching is becoming an increasing problem on several refuges.

The law enforcement staff also supports the biological and public use programs. Their duties include enforcing laws, collecting and counting entrance fees, contacting visitors, participating in the prescribed fire program, participating in public events, and counting wildlife. A station-by-station overview of the Complex Law Enforcement Program follows.

Amagansett

As a result of its unique double dune system, most of the refuge is closed to the public except by special use permit. Fishing the Atlantic Ocean from shore, which is open to the public, does occur. Trespassing into the closed area and dumping along the perimeter are the main law enforcement problems.

Conscience Point

This 60-acre refuge is located 5 miles west of Morton, and is closed to the public except by special use permit. Enforcement issues consist mainly of trespassing e.g. from waterfowl hunters on properties adjacent to the refuge, with occasional reports of poaching white-tailed deer.

Elizabeth A. Morton

Morton refuge, located 40 miles east of the Complex headquarters, is open to the public year-round and is part of the Federal Fee Demonstration Program. Fee compliance checks are done throughout the year, particularly during periods of heavy public use. As a result of the legally protected nesting piping plovers, terns, and ospreys, and the presence of other migrating shore birds, we close the peninsula to the public from April 1 to August 31. Trespassing by boaters is a continual problem in the summer. The vandalism of the refuge signs and building occasionally happens. The feeding of wildlife is becoming an increasing problem, as the wildlife lose their fear of humans, and as this activity has attracted Norway rats to the area.

Lido Beach

This wildlife management area comprises mainly tidal wetland. It is closed to the public except by special use permit. Most violations involve trespassing and dumping.

Oyster Bay

This refuge, located on the north shore of Long Island, consists of 3,204 acres of bay bottom and tidal wetland, its boundary being mean high water. It is a prime area for wintering waterfowl. No waterfowl hunting is permitted at the refuge. Enforcement issues center around the construction of illegal structures, mainly docks and seawalls, along the shoreline. Illegal moorings on the refuge are also increasing.

Much staff time is spent researching the historical status of all structures on refuge property and reviewing permit applications for construction, repair, or replacement. Public use on the refuge includes boating, associated water sports and fishing, as well as environmental education and interpretation through The Waterfront Center and Friends of the Bay. Shell fishing does occur on the refuge, but is controlled by the Town of Oyster Bay as a result of the Deed of Gift.

Sayville

The FAA property adjacent to Sayville contains the largest population in the state of New York of sandplain gerardia, a federally listed endangered plant. The refuge is closed to the public except by special use permit. Most violations involve trespassing, particularly by local juveniles and the homeless.

Seatuck

Seatuck is closed to the public, except by special use permit. We do have an Ecological Services office and two residences inhabited by Service employees on this refuge. Most violations involve trespassing, dumping, and vandalism.

Target Rock

This refuge, located 45 miles west of Complex Headquarters, is open to the public year-round, and is part of the Federal Fee Demonstration Program. Law enforcement at this station includes intermittent fee compliance checks and regular patrols. Approximately half of the beachfront is closed from April 1 to August 31 to protect nesting bank swallows and shorebirds. Entry into closed areas, unleashed dogs, jogging, and violations of state fishing regulations occur occasionally. Vandalism and trespassing during closed hours are also occasional problems.

Wertheim

The Complex headquarters houses its main administrative and maintenance facilities. The brunt of the Complex law enforcement is conducted at this station. Illegal entry to refuge buildings has occurred in the past, resulting in the theft of thousands of dollars of government property. The installation of an alarm system, security lighting and fencing has alleviated most of the problems. Trespassing into closed areas and after refuge hours occurs frequently.

The Suffolk County Police Department has investigated three violent crimes on or close to the refuge in the past 17 years, and has interdicted prostitution at the fishing access site off Montauk Highway.

Evidence of white-tailed deer poaching is prominent, with one recent case resulting in an arrest and prosecution. The dumping of household trash and construction debris is a persistent problem, as is using ATVs illegally. Although on the decline, wildland arson has also been an ongoing problem. The vandalism of refuge signs and gates occurs sporadically.

Visitor Center/Headquarters

Wertheim serves as the headquarters for the Complex because of its central location among the refuges and its easy accessibility from major public roads. It is located in the Town of Brookhaven, Suffolk County, New York, approximately 45 miles from New York City.

The existing administrative office space for the Complex is a 1,200 sq.ft. converted hunting lodge built in the early 1900s. Two refuge staff first used it as office space in 1974. Since then, the Complex has grown to encompass 9 refuges, 12 permanent employees, and varying numbers of seasonal employees, student interns, volunteers and partners. The headquarters facility now consists of the original converted hunting lodge, two office trailers, and a small office in the maintenance shop. As our scope of operations and responsibility has increased, the present office space has become severely inadequate and unsafe to serve the public or the missions of the refuge, the Complex and the System.

In 1991, refuge staff developed a station management plan for the Complex approved by the Regional Office in 1992. Since that time, the location and timeline for building the facility changed due to funding. One of that plan's management focus areas was the development of a visitor center at Wertheim. The refuge public use management plan also called for a visitor center. The proposal for a visitor center is an outgrowth of earlier efforts to provide the public with wildlife-dependent recreational and educational opportunities throughout the year. The visitor center would also resolve the current, inadequate office space problems.

These are our goals for a Headquarters and Visitor Center at Wertheim.

1. Help meet the needs for wildlife-dependent recreation, environmental education and interpretive exhibits, programs, opportunities for residents and visitors to Long Island year-round in any weather.
2. Provide a safe and effective working environment for the staff, volunteers, seasonal interns and visitors at the Complex, and provide the public with direct access to Complex staff.
3. Provide ecotourism and economic benefits to the surrounding communities and Long Island.
4. Provide a high-quality, wildlife- and habitat-oriented Visitor Center for Long Island.
5. Illustrate the mission, activities, and achievements of the Fish and Wildlife Service, the National Wildlife Refuge System, and the Long Island National Wildlife Refuge Complex for the American public.

Partnerships

Our staff is heavily invested in habitat restoration programs off-refuge that export the Service expertise to benefit wildlife across Long Island. Such activities include re-establishing native warm season grassland, improving beach habitat for colonial water birds, setting back the succession of red cedar from a unique maritime grassland, and improving salt marsh habitats. The Complex led the formation of the Long Island Wetland Restoration Initiative, which has partnered with more than 20 land-owning entities in restoring more than 2,000 acres of Long Island wetlands since 1997. In late 2000, the Complex entered into an Interagency Agreement with the U.S. Department of Energy to manage wildlands at nearby Brookhaven National Laboratory. That partnership furthers the Service mission by funding pine-barrens-related ecological studies and applying habitat management techniques that may also be applied to Complex refuges. Our staff also contributes technical expertise to the Central Pine Barrens Joint Planning and Policy Commission, a governmental agency aimed at protecting unique natural communities. See table 3.7 for a list of some of our partners.

Table 3.7. Current Partners*

BOCES (Nassau; E. Suffolk)	National Audubon Society
Central Pine Barrens Commission	National Park Service - Sagamore Hill Historic Site
Cornell Cooperative Extension	The Nature Conservancy
Dowling College	NY Fishing Tackle Trade Association
Ducks Unlimited	NYSDEC
Elected Officials	NYSDEC Forest Rangers
Environmental Defense	Post Morrow Foundation
Foundation for Ecological Research	Southampton College
Friends of the Bay	Southampton Trail Preservation Soc
Friends of Wertheim	SUNY Stony Brook
Greenbelt Trail Conference	Suffolk County Parks
Long Beach School District	Suffolk County YCC
Long Island Institute of Professional Studies	Towns
Long Island Power Authority	Trout Unlimited
Long Island Weed Management Area	Trust for Public Lands
Master Naturalist Society of Long Island	U.S. Department of Energy - Brookhaven National Laboratory
Media	Volunteer Fire Departments
Nassau County Parks	

*Not a comprehensive list

We work diligently to reach out to those who will take wildlife and natural resource conservation into the future: the children and young adults attending schools on Long Island. Our staff collaborates with the Long Island Institute of Professional Studies, providing workshops and presentations for teachers learning to bring environmental education into their classrooms. The Complex has given first-hand experience to local high school students who, in turn, conduct scientific research and monitoring on refuge lands. Many of our major outreach efforts involve staff participation and as many as 20 environmentally oriented entities.

Since Friends of Wertheim incorporated in fall 1998, they have contributed their energies, advocacy, and innovative ideas for conservation, such as acquiring wildlands slated for development. The Friends are a non-profit advocacy group dedicated to supporting Complex goals in the community through public education and interpretation, project funding, and volunteer coordination. They are "dedicated to the enduring protection, management and appreciation of Wertheim refuge and its environs."

Volunteers

The Complex-wide volunteer program is managed from the Wertheim headquarters. Approximately 100 volunteers are used regularly to assist in various duties: survey work, nesting structure upkeep and monitoring, facilities and trail maintenance, photography, and administrative assistance. Partnerships with the Suffolk County Department of Labor Youth Conservation Corps, programs like Americorps, and the Service SCEP and STEP programs offer resources for placing volunteers at the Complex. There is great interest and potential in expanding the volunteer program at the Complex.

Facilities and Maintenance

The facilities and maintenance center for the Complex is also at Wertheim. Complex staff offices are spread out across four buildings to meet minimum space requirements for each staff member. The main office, situated on the western shore of the Carmans River, was historically a seasonal hunting camp for the Wertheim family. That building is small, and contains only two private offices, a lunch room/ conference room and a reception area. To accommodate our staff, we purchased and converted two trailers into office space, without plumbing facilities, directly across from the main office in the late 1990s. The trailers provide office space for five employees as well as two Ducks Unlimited personnel. Our maintenance staff shares an office inside the maintenance shop building.

Facilities are present at Wertheim's main office area, the Wellington property, and Seatuck, Target Rock, and Morton refuges. All four refuges were historically staffed, and therefore, contain offices, quarters and an array of outbuildings. Since the Complex was reorganized in the mid-1990s, only the Wertheim offices have been staffed. Unstaffed offices at Target Rock and Morton are used as visitor contact stations.

The Complex maintenance facility is located next to the office complex at Wertheim, and consists of three separate buildings: maintenance, wood shop, and storage. The maintenance building contains an office and three garage bays

with a vehicle lift that allows most mechanical repairs. The wood shop building contains the woodworking shop with several carpentry tools. Most of the small engine equipment is contained within that building's three bays. A small section of the wood shop building designated as the fire cache contains nearly all of the fire equipment for the Complex. Everything from interpretive brochures to old electronic equipment can be found in the walk-in attic upstairs in the wood shop. The wood shop is in poor shape and, as a result, some materials stored in it are getting damaged.

The Complex requires a rather extensive refuge quarters program. Quarters are a necessity given the extreme high cost of living on Long Island. Without the housing, employees could not afford to work at the Complex. Having FWS employees on the refuges 24 hours a day also provides security. The quarters are located at Wertheim, Seatuck, Target Rock and Morton. Refuge employees rent the houses located at Wertheim and Morton, while the Division of Law Enforcement employees rent the quarters at Seatuck and Target Rock.

The maintenance staff consists of three employees: an engineering equipment operator/maintenance leader, a carpenter, and a maintenance worker. Those employees are responsible for Complex-wide maintenance, and lend support to the biological, public use, and resource protection and visitor safety programs. Regular maintenance is required at the Wertheim, Morton and Target Rock refuges, which contain public restroom facilities and nature trails. The frequency of maintenance is contingent upon the seasons and the weather.

M. Liu/USFWS

A building in the Wertheim maintenance facility.

Environmental Contaminants/Oil Spills

In 1990 and 1991, Service contaminant specialists investigated Wertheim, Oyster Bay, and Amagansett for the presence of environmental contaminants. They sampled sediment, surface water, and animal tissues. The sediments collected at Wertheim and Oyster Bay contained several heavy metals, including lead, zinc, cadmium, chromium, copper, manganese, mercury, and arsenic, at levels exceeding at least one of the concern levels reviewed. The studies concluded that there is a transport of contaminants onto Wertheim and Oyster Bay. At Wertheim, the lower reaches of Little Neck Run and Yaphank Creek and the Carmans River south from Montauk Highway to the Complex headquarters were identified as depositional areas with the greatest level of contamination.

The Complex biologist traditionally served as a field response coordinator for coastal oil spills in New York Harbor, the tidal portion of the Hudson River, and Long Island's shoreline. That duty is now shared with staff from our Ecological Services New York Field Office. In 2000, the Complex received 150 reports of oil or gasoline spills. Most were minor, and minimally affected our federal trust resources.

Research and special use permits

Special use permits must be applied for in writing to the refuge manager. Each request is thoroughly reviewed. Most requests for academic research on the refuge are approved but each has special conditions assigned to it to ensure safe and compatible work. All research or studies require a final report of findings upon completion of the project. Institutions such as the State University of New York, Harvard University, and the U.S. Geological Survey Biological Resources Division have performed diverse, impressive research at the Complex. Since 1999, studies have been undertaken on the effects of Open Marsh Water Management, juvenile American eel migration, salt marsh subsidence, maritime grassland community associations, non-target effects of mosquito control, and marsh mallow genetics.

Environmental educators may also request special use permits to use limited access areas within the Complex. We require them to submit a proposal which outlines their program objectives, activities conducted, and the areas to which they seek access. There is no charge assigned to educationally-based special use permits. Occasionally, we issue permits to nature photographers to enter closed areas. In turn, they traditionally have allowed us to use their images in our outreach materials, but that is not a requirement. There are also special use permits for commercial benefit, but only if it is compatible with the resource; in those instances a charge is assigned.

USFWS

Green-winged teal

Chapter 4

Management Direction and Implementation

- Introduction
- Relating Goals, Objectives, and Strategies
- General Refuge Managment
- Refuge Goals, Objectives, and Strategies
- Implementation, Monitoring, and Revision

Introduction

This CCP includes an array of management actions that, in our professional judgement, work towards achieving the purposes of all the refuges in the Complex, the vision and goals for the Complex, and State and regional conservation plans. In our opinion, it will effectively address the key issues. We believe it is reasonable, feasible, and practicable.

In all program areas, this CCP will enhance the quality and sustainability of current resource programs, develop long-range and strategic step-down plans, promote partnerships, and preserve, manage, and restore habitat.

Relating Goals, Objectives, and Strategies

Developing goals for the Complex was one of the first steps in our planning process. Those goals, common to all of the alternatives, are intentionally broad, descriptive statements of the desired future conditions for Complex lands. They articulate the principal elements of refuge purposes and our vision statement, and provide the foundation for developing specific management objectives. After developing our goals, we considered a wide range of possible management actions or strategies that could help us meet them. Then we began the process of creating alternatives.

Essentially, objectives are incremental steps we take to achieve a goal, and they further define management targets in measurable terms. Objectives can often provide the basis for determining more detailed strategies, and monitoring and evaluating refuge management performance. For each objective, we developed strategies: specific actions, tools, techniques, or a combination of those that we may use to achieve the objective. We will use the objectives in this CCP in writing step-down plans, including habitat management plans. In the process of developing step-down plans, we may revise some of the strategies, but most will translate directly. We will measure our success by how well we achieve our objectives.

Unless otherwise noted, Complex staff will implement all of the actions described in this chapter, assuming that appropriate staffing is available.

General Refuge Management

We primarily developed our management direction hierarchically from goals to objectives and strategies. However, we also found that there were many actions we wanted to highlight that either relate to multiple goals or represent general administrative or compliance activities. These are presented in this section.

Biological monitoring

The Complex is currently developing a Habitat Management Plan with other National Wildlife Refuges in Bird Conservation Region 30. The HMP will provide specific guidance for the implementation of management strategies such as invasive species control and habitat monitoring efforts.

Protecting amphibians and reptiles

At Wertheim, we will confirm the presence of the state-endangered mud turtle, and survey anurans under a region-wide protocol.

Managing for black duck and other wintering waterfowl

We manage the Big Fish Creek impoundment at Wertheim for waterfowl and shorebirds, and conduct waterfowl and shorebird surveys there. Because invasive species impact black ducks and other wintering waterfowl, we control common reed (*Phragmites australis*) with chemical and mechanical treatments, and limit mute swan populations by addling eggs. Two important factors in the overgrazing of the restoration plantings at Oyster Bay refuge were the small size of the planted areas and the low fencing used to exclude geese. At the nearby Beaver Dam Creek planting, fencing has successfully prevented overgrazing by geese in the areas planted in 2005 and 2006.

Water quality

We will continue to support the Friends of the Bay in monitoring water quality at Oyster Bay by providing and maintaining a Hydrolab® water quality surveyor. Receiving information from county and state workers, volunteers, legislators, and the general public will keep us apprised of water quality conditions.

We also monitor all dock structures on the refuge annually, and extensively review all special use permit requests according to our revised policy.

Protecting piping plover, roseate tern, and least tern

Piping plovers, which can be found breeding at the Complex, are federal-listed as threatened and state-listed as endangered. Roseate terns are federal- and state-listed as endangered. They feed and rest on the refuges during winter migration. Least terns, a state-listed threatened species, rest on refuge units while migrating in the winter.

We close sections of beach at the Morton and Target Rock refuges for the plover and tern nesting season. At Morton, we prohibit public access to the peninsula, and at Target Rock, we prohibit access to portions of beach. We enforce the closure at Morton with the daily presence of seasonal plover stewards and periodic patrols by a refuge officer. The plover stewards erect predator exclosures for piping plover and the least tern colony, monitor nesting success, and assess the relative abundance of potential predators. Parts of the Morton, Target Rock, and Amagansett refuges remain open during those beach closures. We install symbolic fencing to restrain public use on beaches above mean high tide line. We will install artificial nest structures for roseate terns at Morton.

To raise public awareness of threatened or endangered species and other species of concern, volunteers and seasonal staff meet and educate beach visitors; interpretive signs are available at Morton; and the public can participate in the beach clean-up program at Target Rock. At both refuges, signs and press releases inform the public about beach closures.

Establishing hunting and fishing opportunities

We evaluated and approved a controlled public deer hunt in an environmental assessment and through its public input. That hunt began at Wertheim in the fall 2005. We will continue to evaluate the effectiveness of the hunt.

Fishing areas are available at Target Rock, Amagansett, Wertheim, Morton, and Oyster Bay. See table 3.5 for details, and map 4-1 for other public use opportunities available at the Complex.

Wildlife observation, photography, and interpretation

We will maintain existing opportunities in wildlife observation, photography, and interpretation as described in chapter 3. Cross-country skiing, snowshoeing, and non-motorized boating are activities that can help facilitate these priority public uses. For example, cross-country skis and snowshoes allow visitors to access existing trails at Wertheim, Morton, and Target Rock during the winter months when there is snow on the ground. Similarly, non-motorized boats allow visitors at Wertheim and Oyster Bay a means to engage in wildlife observation and other priority wildlife-dependent public uses in areas inaccessible by foot. Since skiing and snowshoeing are winter activities that require snow, there are fewer adverse impacts to the Complex's species of concern compared to activities like jogging, bicycling, and horseback riding. See map 4-1 for other public use opportunities available at the Complex.

Maintenance Dredging

Maintenance dredging at Seatuck and Morton refuges provides boat access to navigable waters. Maintenance dredging is not a priority public use of the System. However, it does allow access for other priority public uses, including wildlife observation and photography. Refuge staff will evaluate all requests for maintenance dredging before allowing them on refuge property. No dredging project will be allowed if the refuge manager has not issued a special use permit (SUP), or if the refuge manager determines that dredging may adversely affect wildlife, wildlife habitat, on-going or planned refuge management activities, approved priority public uses, or public health and safety. We will also require any dredging project applicant to obtain all federal, state, and local permits applicable before we issue a SUP.

Increasing opportunities for public stewardship and improving outreach

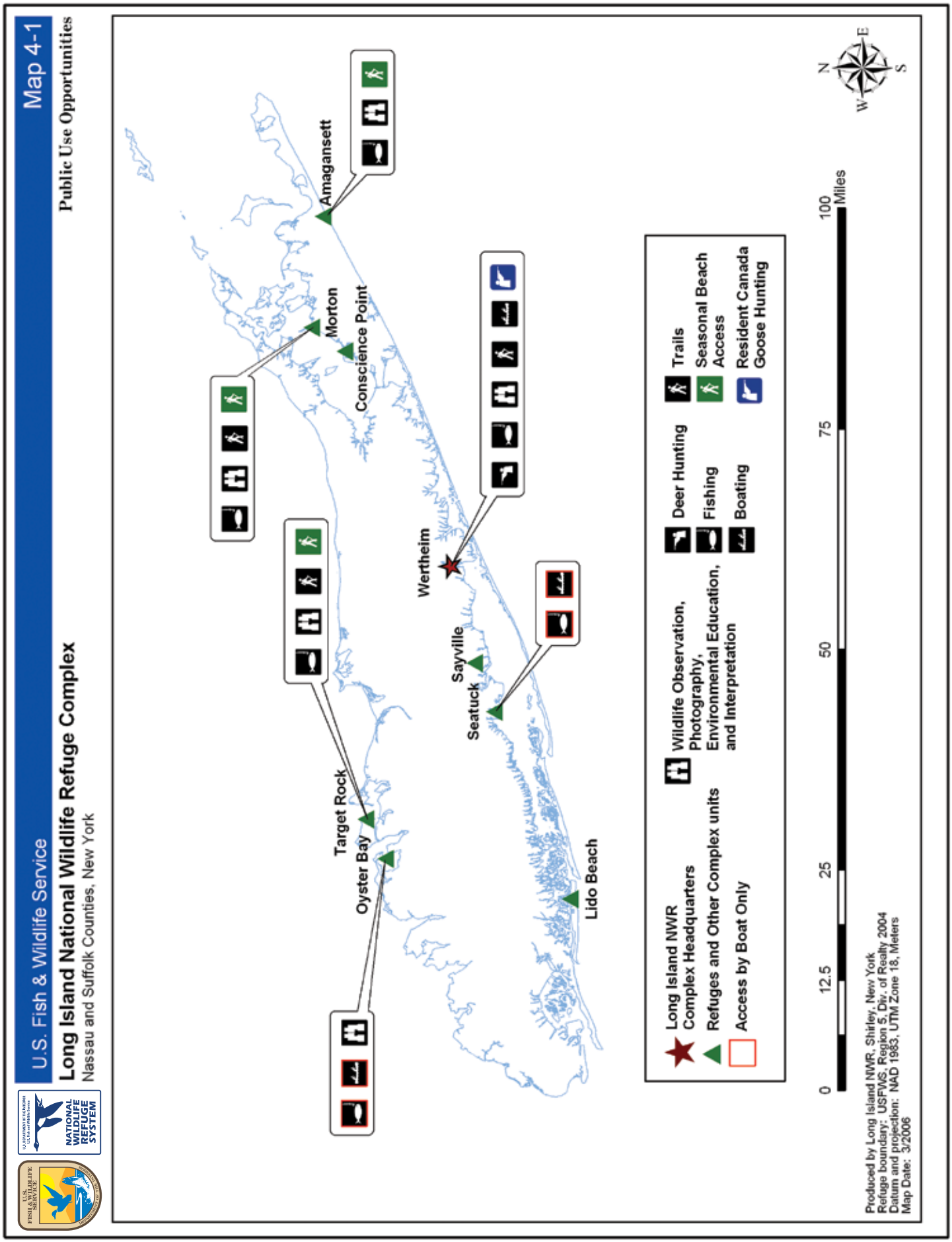
We will promote our existing partnerships, new partnerships, and volunteer opportunities. Those relationships are vital for success in managing all aspects of the refuge, from protecting land to managing habitat and species or providing wildlife-dependent recreation.

Volunteers and partners have opportunities to lead interpretive tours, conduct teacher workshops, maintain trails, and update interpretive materials. Refer to chapter 3 for details, more volunteer opportunities, and how we maintain and improve our volunteer and partner relations. Table 3.7 lists many of our established partnerships.

We update elected officials, partners, and other agencies with what we are doing at the Complex. News releases, fact sheets, brochures, our website, and participating in local events all improve our outreach.

Land Acquisition

We will continue to acquire refuge inholdings within approved refuge boundaries as willing sellers become available. We will also continue to consider minor acquisitions adjacent to existing refuges that are biologically important or provide connections with other protected lands of our conservation partners, e.g. the FAA site adjacent to Sayville, the Shinnecock wetlands east of Wertheim, and Lloyd Harbor and the private beach at Target Rock. These situations will be handled on a case by case basis as they become available.


U.S. Fish & Wildlife Service
Map 4-1
Public Use Opportunities
Long Island National Wildlife Refuge Complex
Nassau and Suffolk Counties, New York
Amagansett
Morton
Conscience Point
Wertheim
Sayville
Seatuck
Lido Beach
Target Rock
Oyster Bay
Long Island NWR Complex Headquarters
Refuges and Other Complex units
Access by Boat Only
Wildlife Observation, Photography, Environmental Education, and Interpretation
Deer Hunting
Fishing
Boating
Trails
Seasonal Beach Access
Resident Canada Goose Hunting
0
12.5
25
50
75
100
Miles
N
E
S
W
Produced by Long Island NWR, Shirley, New York
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

Refuge Goals, Objectives, and Strategies

The following goals, objectives, and strategies are designed to enhance the quality, effectiveness, and sustainability of our management priorities. They will increase our protection and management of endangered, threatened or other species of concern, including migratory wildlife. They will also increase the number and quality of opportunities for compatible, wildlife-dependent, public recreation, and allow the Complex to benefit from its proximity to New York City and urban communities.

Goal 1.
Improve the biological diversity and integrity of upland cover types to sustain high-quality habitat for migratory passerine birds.

Objective 1: White-tailed deer management

Within 10 years, reduce deer densities at Wertheim and Seatuck so that they do not exceed 20-30 deer/square mile. This will improve conditions for ground nesting birds by promoting forest regeneration and increasing vegetation diversity.

Rationale

Overabundant populations of white-tailed deer reduce forest regeneration, impact woody understories, eliminate many herbs, minimize plant diversity, and impact habitats for songbirds (Healy et al. 1997). The impacts of overabundant deer populations on public health and safety include tick-borne disease and vehicle collisions. The economic impacts of overabundant deer include negative effects on timber resources and ornamental and agricultural plantings (Woolf and Harder 1979, Cypher and Cypher 1988).

Six fenced deer exclosures at Wertheim help us evaluate forest regeneration in the absence of deer herbivory. Regeneration is important for the long-term resilience of a forest and for ground-nesting birds. We will continue to monitor deer populations and their effects on wildlife habitats at Wertheim and Seatuck refuges, and expand monitoring onto the remaining upland units of the Complex. We initiated a controlled public deer hunt at Wertheim in the 2005 deer hunting season, and will continue the annual deer cull at Seatuck as needed.

Strategies

- Manage deer populations exceeding 20–30 deer/square mile with lethal controls.
- Implement improved public hunting programs at Wertheim; the only Complex unit sizeable enough to support such activities.
- Accurately estimate deer densities through the use of ground-based and aerial counts and establish monitoring plots to assess the effects of deer browsing on forest regeneration.
- Assess what ground-nesting bird species use forested habitat communities at the Complex and the current status of those species.
- Develop a monitoring regime to follow species response to deer management practices at Wertheim.
- Improve and extend fencing along the western refuge boundary at Seatuck.

- Encourage deer management programs on state lands in the immediate vicinity of refuges: e.g., Target Rock and Seatuck.

Objective 2: Invasive plant management

Within 5 years, complete mapping of upland invasive plant species including Asiatic bittersweet, black locust, Japanese barberry, Japanese honeysuckle, and multiflora rose, and develop stand-specific strategies for management. Within 10 years, implement the management strategies to treat 30% of the stands dominated by invasive species.

Rationale

Invasive plants are nationally recognized as threats to ecosystems. We have kept strategic pristine areas such as forest interiors free of exotic plants by hand-pulling and applying an herbicide to cut stumps. In 2003, the Challenge Cost Share Program provided matching funds for controlling 4 acres of black locust at Conscience Point, 12 acres of Asiatic bittersweet and black locust at Wertheim, and 2 acres of black locust at Seatuck.

The Complex is a founding member of the Long Island Invasive Species Management Area. Networking with other members and attending periodic meetings has helped us recognize the most problematic species, develop mapping standards, prioritize treatment regimes, and prepare outreach materials. Our staff will continue to collaborate in both field projects and meetings. See goal 2, objective 1 for information about controlling *Phragmites*.

Strategies

- Identify and map invasive plant locations and their approximate acreage at each refuge by 2010.

- Develop a treatment prioritization that accounts for the "invasability" of a species, resources at risk of invasion (e.g. federal-listed species), extent of spread, and ease of control.

Objective 3: Restore and maintain fire dependent native plant communities

By 2008, map vegetation communities that are fire-dependent, describe their current and future desired conditions, develop a strategy to restore and maintain these communities, and begin implementing the strategy.

Rationale

The Brookhaven Fire District has become more engaged with the refuge in participating in prescribed burns and discussing lesser impact wildfire suppression techniques. We will negotiate similar cooperative agreements with the other six Fire Districts that provide protection for the other refuges as time allows.

Fire is part of a natural process that shaped the North American landscape over thousands of years (Patterson and Sassman 1988), and is recognized as one of the primary historic disturbances on Long Island that contributed to controlling or influencing the structure and composition of native vegetative communities. Early- to mid-successional habitats in northeastern North America, such as pine barrens and maritime heath, developed over time on coastal areas from

southern Maine to the mid-Atlantic, as a result of infrequent natural fires, and frequent fires set by Native Americans (Patterson and Sassman 1988, Vickery and Dunwiddie 1997). More recently, however, humans have suppressed wildfires aggressively, particularly in densely populated areas. When fire is excluded from a fire-dependent ecosystem, the vegetation in those communities is either altered to favor species that dominate under longer disturbance intervals for that ecosystem, or the plant community may be completely converted to a non-fire-dependent type. Because the restoration of the influence of natural wildfires is often not possible to restore or maintain those communities, the fire period that supports them has to be determined, and then mimicked with prescribed fire.

Prescribed fire is a management tool involving the closely controlled ignition, monitoring, and suppression of fire to attain a habitat goal. Prescribed fire has been used successfully on Long Island since the early 1990s to maintain and enhance woodlands, grasslands, and marshlands, including endangered fire-dependent plant communities. While ensuring public safety and minimizing habitat destruction and property damage will receive top priority, we will encourage Fire Departments to use Minimum Impact Suppression Techniques, which will allow fires to burn under certain conditions and extinguish them with minimal residual adverse effects on the environment.

Strategies

The primary purpose of using prescribed fire is to restore and maintain fire-dependent native plant communities. Thus, it is important to first have a precise vision of the historic fire regimes that shaped the native pine barrens and maritime grasslands in central and eastern Long Island, and the probable distribution of those habitat types on existing refuge lands.

- Determine the historic fire return interval, seasonality of natural fires, and fire intensity for pitch pine forest, hardwood forest, shrubland, and grassland communities (Jordan et al. 2003).

- Use fire history information, USDA soils databases for Long Island, and historical information on vegetation community distribution for Long Island to estimate the types and possible proportions of fire-dependent vegetation communities that historically existed at each refuge unit.

- Use that information as an “ecological roadmap” to evaluate maps of existing vegetation communities and soil types per refuge unit. Assign areas for restoration or maintenance of fire-dependent habitat types. Develop a “future conditions map.”

- Evaluate that future conditions map in light of constraints posed by adjacent private properties and Wildland Urban Interface (WUI) issues. Move target areas which may be subject to high intensity crown fires away from WUIs.

- Group target vegetation communities into logical burn units by fire regime. For example, group all areas scheduled for top-killing, high intensity fires, surface fires, of return interval 5 to 20 years into one burn unit. Likewise, group all areas scheduled for low-intensity, dormant season surface fires of return interval 2 to 10 years into a separate burn unit.

- Cooperate with local fire departments and partner agencies with regard to suppressing wildfires and supporting prescribed fires.
- Begin implementing prescribed fire and other associated treatments at a refuge level scale on the highest priority units and rotation.
- Conduct stand and fuel inventories for each refuge as a baseline for fire management treatments.
- Identify priority systems and units based on age class, stand condition, time since last fire, threatened and endangered species, etc.
- Develop an equipment cache adequate to support fire-related activities of Complex and Central Pine Barrens Commission partners.
- Develop outreach programs to educate the public about fire issues.

Objective 4: Restore and enhance bird populations

Initiate a biological monitoring program that assesses bird populations and habitat conditions within upland cover types for the breeding and non-breeding seasons. By 2010 complete assessments on 50% of upland stands.

Rationale

Rigorous, appropriate, and habitat-specific surveys and monitoring regimes for bird species need to be developed. We are primarily interested in enhancing breeding and non-breeding habitat community functions for migratory birds in forest, grassland, and beach strand communities. Analyzing data from breeding land bird surveys at Wertheim will focus our contribution to regional, national, and Bird Conservation Region 30 goals. We will also develop or adopt appropriate surveying and monitoring protocols for those species using habitats we have not previously assessed.

Staff and volunteers perform surveys of breeding land birds and salt marsh birds at Wertheim, including salt marsh sharp-tailed sparrows and seaside sparrows, under a region-wide protocol. Those surveys provide an index of species occurrence, highlight areas used by declining species, and prove valuable in the analysis of regional breeding concentration areas.

We will apply the following strategies to each refuge as appropriate, depending on its habitats.

Strategies

- Develop baseline surveying and monitoring regimes and adopt or develop protocols for the Complex's habitat communities for breeding and non-breeding seasons and initiate the surveys.
- Analyze baseline data for each community and determine where to focus specifically designed monitoring efforts to help track changes in species/habitat communities. This may be on a particular species guild, bird species, or habitat community of concern which supports a group of species.

- Determine what intervals we need for continued surveys on breeding land birds at Wertheim. Initially, surveys will focus on salt/brackish marsh and pitch pine-scrub oak habitat communities at Wertheim and Sayville. Additional surveys will take place at Seatuck as grassland area is expanded for rare and endangered plant and lepidopteron species.

- Initiate surveys at other refuges in the Complex where restoration, management, or public use occurs.

- Develop an atlas of lepidoptera and odonata for the Complex with the assistance of volunteers and interested associations like the Dragonfly Society of America.

- Continue to monitor forest regeneration plots at Wertheim and establish plots at Seatuck, which also has an overabundant deer population.

- Establish and maintain surveillance programs for forest pest species like the gypsy moth, emerald ash borer, orange-striped oakworm, and the Asian long-horned beetle.

Objective 5: Increase grassland size to benefit nesting grassland birds

By 2010, expand the effective area of grasslands at Conscience Point, Seatuck, and Sayville to the minimum area required by Savannah, Vesper, and Grasshopper sparrows, Eastern Meadowlark, and Bobolink. Ensure that habitat conditions such as vegetation type and density, coverage of woody stems, perch availability etc., are suitable for use by these species.

Goal 2.
Restore the biological health of aquatic habitats to high-quality conditions on the Complex salt marshes, bays, tidal

Objective 1: Reduce Phragmites

By 2007, prevent the expansion of *Phragmites australis* and, by 2010, reduce its overall distribution to 75% of 2005 levels.

Rationale

The invasive plant common reed (*Phragmites australis*) has overtaken and dominated once-prized freshwater marsh communities throughout much of the coastal northeast. Compared to native marsh plants, *Phragmites* is of no food value and provides only limited cover for marsh-dwelling birds. The presence of such dense, monotypic growth severely impacts such species as American black duck (Audubon 2003), other dabbling ducks, least sandpiper, semipalmated sandpiper, willet, and great egret. This plant now dominates roughly 335 acres of coastal marsh at Wertheim. That acreage is greater than half of the marsh and virtually all the tidal-freshwater marsh at the refuge.

Aerial photography interpretations revealed that common reed at Wertheim increased from 155 acres in 1974 to 335 acres in 2000. It now dominates virtually all of the brackish intertidal marsh (Batcher 2003). To limit its spread, we work with the DEC to encourage permitting for the use of herbicides, mowing, burning, and manipulating water levels in Wertheim impoundments.

We initiated a control project at Wertheim's Big Fish Creek impoundment in 2001, and expanded it in 2002 to the sub-impoundment nearby. The treatments included the application of the herbicide Rodeo® by a certified contractor and the prescribed

burning or mowing of dead canes. That treatment regime is repeated annually for 3 to 4 years to improve its effectiveness. Approximately 45 acres are now free of common reed. We will continue to treat previously treated areas until our restoration objectives have been met, and in 2005 we spot treated the headwaters of Yaphank Creek and Little Neck Run, both at Wertheim refuge.

Strategies

- Use 2005 aerials to accurately identify and map Phragmites distribution at all refuge units by 2007.
- Develop a species specific treatment plan basing priorities on the resources at risk of invasion, and ease of control. At Wertheim, part of the treatment plan will involve restoring tidal inundation, therefore increasing salinity which discourages Phragmites growth.
- Implement a treatment plan that controls problematic invasive plants with hydrologic restoration, herbicide application, mechanical removal, and/or prescribed fire with the intent of re-establishing native plants. Such a treatment plan will help eradicate at least 25 acres/year of invasive upland species, including at least 5 acres of invasive wetland plants.

Objective 2: Enhance habitat conditions for salt marsh sharp-tailed sparrow and seaside sparrow

Improve habitat conditions for salt marsh sharp-tailed sparrow and seaside sparrow populations at Wertheim, Morton, Seatuck and Lido Beach through invasive species control (goal 2, objective 1).

Rationale

Since the 1930s, most of Long Island's salt marshes have been ditched for mosquito control purposes (see goal 2, objective 3 for a more detailed discussion on mosquito control). The intent was to eliminate shallow ponds or pannes and other areas of standing water in which female mosquitoes deposit their eggs. The extensive network of parallel and grid ditches at the refuges in the Complex have effectively removed those aquatic features. Some bird, insect, mollusk, crustacean, and plant species flourish only in those communities. The bird species at highest risk that depend on this habitat community are the salt marsh sharp-tailed and seaside sparrows. However, it also provides high-quality feeding and resting habitat for many wading birds, shorebirds, and waterfowl.

Saltmarsh sharp-tailed sparrows and seaside sparrows are high salt marsh specialists. Saltmarsh sharp-tailed sparrow is considered globally vulnerable to extinction and is a priority species for conservation and management. IUCN Red List has the species as globally vulnerable to extinction. Virtually the entire breeding population occurs in USFWS Region 5. Seaside sparrows have a much broader breeding range, but are listed as a Species of Special Concern in New York.

Strategies

- Collaborate with the New York Department of State, the New York Department of Environmental Conservation, The Nature Conservancy, Ducks Unlimited and others to

perform new tidal wetland mapping and digitizing to serve as a basis for management planning, trends analysis, monitoring baseline, and plan for sea-level rise.

- Assess the hydrologic condition of each salt/brackish marsh system at the Complex to determine the factors that altered the tidal exchange.
- Develop salt/brackish marsh restoration plans specific to each marsh system. The plans will outline the impacts that altered each marsh system and the methods to be utilized for restoration.
- Implement the restoration plan to restore 600 acres of salt/brackish marsh at the Complex by the year 2020.
- After we complete our evaluation of OMWM (see goal 2, objective 3) revise mosquito control practices within Wertheim and Seatuck to incorporate OMWM techniques, if appropriate.

Objective 3: Decrease insecticide use in marsh communities

By 2015, enhance the biotic integrity of salt and brackish marshes by decreasing the use of mosquito control chemicals at Wertheim, Seatuck and Lido Beach by 75%.

Rationale

We are working with partners to reduce the amount of spraying on refuge lands and ensure activities are consistent with the Service's interim and future mosquito control guidance. The Service's interim mosquito Guidance (2005) states that "when necessary to protect human, wildlife, or domestic animal health, the Service will reduce mosquitoes associated health threats using an integrated pest management approach, including when practical compatible, non-pesticide actions that reduce mosquito production. Except in officially determined health emergencies, any procedure the Service uses to reduce mosquito production will meet compatibility requirements as found in 603 FW 2 and must give full consideration to the safety and integrity of non-target organisms and communities, including federally listed threatened and endangered species."

Mosquito management is complicated because many refuges in the Complex are adjacent to residential communities where disease vector and nuisance issues are amplified. A conflict of interests arises between protecting public health and protecting and restoring the salt/brackish marsh community. Additionally, OMWM techniques are not favored by everybody because of their initial impact on existing wetlands.

Residents near refuges create pressure to manage mosquito populations. As a result, local governments spray areas of marsh both inside and outside refuge lands by helicopter during the spring-summer mosquito breeding season. The two compounds typically used are methoprene (Altosid®), a growth regulator, and *Bacillus thuringiensis* (Bti), a bacterial pathogen. Past sprayings occurred as often as weekly in August and September at Wertheim, Seatuck, and Lido Beach. More recently, refuge negotiations with local governments have reduced that spraying.

Spraying larvicides may adversely affect non-target wildlife like fish, birds, reptiles, mollusks, and other insects. The long-term effects of those compounds on non-target salt marsh species are not fully known (Brown; date unknown). However, killing mosquito larvae can alter the benthic community and potentially impact the food base of marsh-dependent migratory birds. As a result, the future productivity of the birds may be reduced. In addition, low-flying helicopters have been observed disturbing nesting osprey, and may also stress less visible marsh-nesting birds.

Mosquitoes serve as a valuable food source for many insect and bird species in the salt/brackish marsh community. Although we wish to eliminate mosquito spraying on refuges for the sake of wetlands and wildlife, we still recognize the need to protect public health. Therefore, when public health is at stake, we have authorized the use of an environmentally benign larvicide that specifically targets mosquito larvae. The use of larvicide is less damaging to the environment than adulticide.

We need more information before implementing any new management strategies for controlling mosquitoes. We are assessing the results of an open marsh water management (OMWM) pilot study conducted at Wertheim and considering its potential as both a mosquito control mechanism and a wetlands restoration tool. We will also be evaluating the results of a 5-year region-wide OMWM study recently completed by the Service. We are sensitive to concerns about the health risks that mosquitoes pose, the impact of pesticides on water quality, habitats, and human health and the impact of OMWM techniques on the present marsh landscape. The results of the studies, public concerns, and any new information our biologists have gathered will guide our future mosquito and marsh management strategies.

Implementing OMWM techniques will reduce mosquito larvae numbers and decrease the risk to public health. However, OMWM does not eliminate all mosquitoes, so nuisance mosquitoes may persist, and it is also not favored by all. We do not support spraying for nuisance mosquitoes, because the cumulative negative impacts of the compound on the environment do not warrant its use.

Strategies

- Study and document the effects of larvicide on aquatic insects by comparing communities within sprayed and unsprayed marshes.
- Eliminate the routine spraying of mosquito larvicides. Revise special use permits to allow spraying on refuges only during public health emergencies and not for public health nuisances.
- Continue OMWM pilot restoration study at Wertheim.
- After evaluating the results of the OMWM study, explore the possibility of returning marshes back to “pre-ditching” state, with active and widespread creation of shallow ponds, pannes, and natural tidal creeks instead of ditches to substantially reduce mosquito population.
- Develop and enhance outreach efforts for neighbors in mosquito-prone areas. Inform them of the impacts of mosquito spraying on non-target insects, mollusks, crustaceans,

fish, and birds As new information becomes available, we will educate neighbors about alternative control measures like OMWM.

Objective 4: Shoreline restoration

By 2012, where practical, restore shorelines of tidal rivers and creeks to native emergent vegetation and mud flats.

The zone between the aquatic environment and the adjoining upland is especially important for wildlife, given its diversity of plant cover and rich food resources. Unfortunately, those zones typically border rivers and bay shores, and therefore, are often human-altered sites such as bulkheads and dredge dumps. The strategies in this objective are intended to restore the habitat functions associated with such areas.

Strategies

- Remove the bulkheaded segments of shoreline on Wertheim's Carmans River and Seatuck's Champlin Creek. Grade upland to a 10:1 slope and establish native emergent plant communities.
- Control Phragmites along tributary creeks through hydrologic, chemical, and mechanical means.
- Remove deposits of dredged material to reclaim the former native emergent marsh at Seatuck.

Objective 5: Oyster Bay

Within 15 years, revise Oyster Bay policy to clarify the criteria for legal private structures and the refuge's authority and responsibility over them. We will ensure that the policy addresses construction and expansion of un-permitted docks and other shoreline structures on refuge property and is also consistent with the intentions of the original deed, the Refuge Improvement Act, and other Service mandates.

Rationale

We continue to implement the 1989 decision document regarding private structures and dredging; work with the DEC and the ACOE to review construction and dredging projects; participate in the long-range planning coalition; and survey the refuge boundaries to minimize impacts on its aquatic habitats. We also have a MOU with the Friends of the Bay for monitoring water quality. The data collected by the organization will help with management decisions. We have also established partnerships with the Long Island Wetland Restoration Initiative, Ducks Unlimited, and others to restore wetlands and other habitats on Long Island for the benefit of wildlife.

Strategies

- Produce compatibility determinations for all private structures and activities in the refuge by year 5 (i.e., 5 years after plan approval).
- Inventory all private docks in the refuge and determine the legality of each by year 5.

- Inventory all moorings in the refuge and determine the legality of each by year 10.
- Inventory all other private structures in the refuge, including boat ramps and bulkheads, and determine the legality of each by year 10.
- Expand on the definition of each criterion from the 1989 Decision Document to clarify the policy for private structures by year 2. Incorporate that clarification into the Code of Federal Regulations under Oyster Bay National Wildlife Refuge.
- Work with the town to clarify all boundary issues, including the location of the corners and any private, pre-existing riparian rights by year 5.
- Work with the town, villages, and other pertinent entities to assess the current number of moorings and which entities are authorizing moorings in the refuge by year 5.
- Develop and finalize MOU with the town, villages, etc. by year 10.
- Develop outreach materials on the private structure policy in Oyster Bay by year 3. Conduct briefings for all levels of elected officials and send a refuge letter to each landowner with property adjacent to the refuge, and to applicable realty offices.
- Remove all illegal structures, docks, and moorings from the refuge by year 15.
- Restore all intertidal areas that have been denuded of vegetation by year 15.
- Initiate the sensitive and controversial issue of moorings with the town, elected officials, etc. around year 5. Develop a MOU regarding the number, type, and location of moorings and the fee procedure and ownership associated with them.
- Work with DOI solicitor's office and DOJ's AUSA to develop a resolution regarding the Pascucci dock matter and serve the FWS letter by year 2.
- Complete the land transfer of the refuge beach property for the town wetland acreage by year 2.

Objective 6: Enhance brook trout

By 2015, survey the native sea-run brook trout population that exists in Yaphank Creek at Wertheim. Develop and implement habitat enhancement strategy to remove invasive vegetation and maintain water quality, working with off-refuge landowners within the watershed. Remove passage barriers such as LI Railroad culverts.

Rationale

Yaphank Creek at Wertheim refuge is recognized as one of the few locations on Long Island that supports a native population of sea-run brook trout. Organizations like Trout Unlimited have been charting trends in this population for several years, and have a great interest in its long-term well-being. To satisfy angler demand, the DEC stocks hatchery-raised rainbow and brown trout in the Carmans River several times each year. The stocked fish are part of a "put-and-take" fishery, whereby the fish are of "legal" size.

We will continue to monitor the size, age, and geographic distribution of the native population at least once every 5 years and restore habitat degraded by Phragmites

and mute swans along the shoreline of Yaphank Creek. We will also continue monitor the effects of stocking hatchery-reared brown and rainbow trout to ensure native brook trout populations are not put at risk. This will be accomplished with the assistance of FWS Fisheries, NOAA Fisheries, and the DEC.

Goal 3.
Restore and increase the biological diversity and integrity of native grasslands to foster endangered plant recovery and the communities upon which they depend.

Objective 1: Sandplain gerardia

Maintain and enhance the existing sandplain gerardia population at Sayville FAA site.

Rationale

Sandplain gerardia is a federal-listed endangered plant that ranges from northern Maryland through Cape Cod. On Long Island, it occurs at 11 sites, including Sayville and Conscience Point, although only five, including Sayville, are viewed as being viable over the long term. The native population Sayville constitutes by far the greatest number of plants of any site on Long Island. In contrast, seeds successfully sown at Conscience Point resulted in the germination of two plants in 2003. Seatuck has soils similar to those on which sandplain gerardia thrives, and may constitute a suitable establishment site.

We will consider current and future access in order to protect plants from accidental harm from public.

More than 85 percent of the New York State population of federal-listed endangered sandplain gerardia grows at a 101-acre site adjacent to the Sayville Unit of Wertheim refuge. Although the Federal Aviation Administration owns that site, we assist The Nature Conservancy in managing it. It represents one of the top three most important populations of sandplain gerardia in the Northeast, and is quite possibly the most viable of the three.

Although we do not own that property, we will continue to assist TNC in its management. Refuge staff will mow the grassland at Sayville annually to discourage the growth of woody plants. We will also continue the translocation in plots at Conscience Point and Seatuck that we started in 2001 and evaluate the current and future access to the site to protect the plants from accidental harm from the public. We will collaborate with TNC and the DEC on periodic, prescribed burns at Sayville, Conscience Point, and Seatuck. Once the Sayville FAA site has been transferred to us, we will develop and implement a prescribed burn regime and remove the intruding, non-native vegetation. Our goal is to restore that site to its natural habitat.

Strategies

- Incorporate a tree/shrub clearing where necessary, and mowing/prescribed fire regimes that increase and maintain maritime grasslands on refuge units, representing a diversity of native grass and herb species.

- Protect the establishment sites from unwanted wildfires and soil-disturbing activities like unauthorized ATV use, excavations.

- Identify appropriate sites in these refuges for endangered plant establishment based on soils and dominant grassland vegetation.
- Coordinate establishment efforts with Recovery Team.
- Monitor the establishment plots for germination/survival rate each September.

Objective 2: Grasslands

Within 10 years, maintain adequate interspersion of successional stages and plant diversity within the Complex's grasslands to maintain the State-listed rare plant and lepidopteron component.

Rationale

The maritime grasslands at Sayville and Conscience Point are considered globally rare (NYSDEC 2004), and support several species of grassland-dependent state-listed endangered or threatened plants and butterflies. The long-term viability of such communities depends upon active habitat management.

Strategies

- Implement a periodic monitoring program for state-listed plants and animals in collaboration with NY Natural Heritage Program.
- Treat invasive plants aggressively with herbicides, mowing, and/or prescribed fire to limit their spread.
- Clear areas of recently established (less than 20 years old) young pitch pine, pitch pine scrub oak woodlands, and scrub oak thickets, to allow for the reestablishment of maritime grassland habitats, and implement a 2- to 10-year, low-to-moderate intensity surface fire regime for grassland habitats (Jordan et al. 2003).
- Maintain areas of young pitch pine, pitch pine scrub oak woodlands, and scrub oak thickets by intermittent mowing combined with scorching moderate intensity surface fire about every 10 years (Jordan et al. 2003).

Goal 4.
Enhance the functionality of coastal strand habitats as they relate to beach-nesting colonial water birds and shorebirds to meet optimal population levels.

Objective 1: Assess plover/tern breeding potential

Assess the condition of coastal strand communities and determine the number of piping plover, roseate tern, and least tern breeding pairs that can be supported at Morton, Target Rock, Amagansett, and Oyster Bay.

Rationale

Although nesting has not been observed at Target Rock, adjoining stretches of beach generally support 1 to 2 plover pairs annually. One nesting pair was observed at Amagansett in 2005. in 2006, 2 pairs of piping plover and 10 pairs of least tern nested at Amagansett; eight piping plover chicks and an unknown number of least terns fledged. Since 2003, NYSDEC have been monitoring nesting piping plover on the sound side of the wetland at Frost Creek, near Oyster Bay NWR, and at Center Island and Stehli Beach.

Strategies

- Assess habitat conditions for plovers and terns as well as the limiting factors affecting productive breeding seasons at the above refuge units with species experts and refuge staff.
- Determine an appropriate goal for the number of nesting pairs at each refuge.
- Identify limiting factors that may be influencing colonial water bird productivity.
- Develop cooperative agreements with partners and adjacent landowners.
- Coordinate with NYSDEC to address piping plover at Oyster Bay.

Objective 2: Active management of habitat/predator/public use

Actively manage habitat, predators, and public use, where necessary, to improve nesting and foraging habitat conditions for piping plover and least tern. Establish breeding common terns by 2010 and roseate terns at Morton by 2020.

Rationale

The level of nesting success by colonial water birds may be influenced by several factors, including the quality of nesting and foraging habitat, the degree of human activity, and the presence of predators. The habitat factors relate to the physical environment; its limitations will constrain any proposed modifications. Human use and predators can be managed by several means, depending on socially acceptable practices.

Strategies

- Reduce the density of beach grass adjacent to current and future nesting areas on all refuge beaches.
- Create new intertidal foraging areas where foraging opportunities are limiting piping plover use.
- Assess red fox, raccoon, Norway rat, crow, and gull populations at each refuge, and develop a predator management plan in collaboration with NYSDEC and USDA Wildlife Services. We will continue to work with our partners, including the state, to address predator management on the Complex.
- Patrol nesting areas during the mid-May to late July peak breeding season to keep refuge visitors out of closed areas at Morton.
- Further restrict areas accessible by the beach-going public and/or limit the allowable range of human activities, including picnicking, canoe portaging, and beach driving.
- Manage dredge spoil and identify sediment sinks that adversely affect beach strand habitat.
- Initiate discussion or consultation with appropriate parties to mechanically modify beach habitat to create extensive shallows. Possible techniques may include manipulating dunes and beach grass to decrease hiding cover for predators and

increase opportunities for overwash, and excavating shallow mud flat foraging areas for plover at Morton.

Goal 5.
Provide priority wildlife-dependent recreational and educational opportunities when compatible with the resource and available funding.

Objective 1: Visitor Service Plan

Within five years, develop and implement a Visitor Services Plan according to the Visitor Service Requirements. The plan will function as a step-down plan for this document and replace the outdated public use plan.

Rationale
More than 40 million people visit units of the Refuge System each year to enjoy a wide range of wildlife related opportunities; nearly 500,000 visit Long Island's national wildlife refuges. As its organic law states, any recreational use on areas of the Refuge System must be compatible with the primary purpose(s) for which the area was acquired or established.

Strategies

- Within 2 years, formally evaluate the Complex visitor services program and wildlife-dependent recreational opportunities.
- Within 4 years, conduct visitor surveys to aid in planning visitor services.
- Within 5 years, make management recommendations and incorporate them into a step-down Visitor Services Plan for the management of the Complex wildlife-dependent public uses and related infrastructure.
- Add sales outlets at Wertheim and Morton.

Objective 2: Headquarters/Visitor Facility

Within 7 years, develop, implement and complete the design, construction, and staffing of an office headquarters and visitor facility.

Rationale
The existing administrative office space for the Complex is a converted hunting lodge of approximately 1,200 square feet constructed in the early 1900s. It was first used as office space by two refuge staff members in 1974. Since then, the scope of operation and responsibility has increased, and the Complex has grown to encompass nine refuge units, up to 12 permanent employees and varying numbers of seasonal employees, student interns, volunteers and partners. The headquarters facility now consists of the original converted hunting lodge, two office trailers, and three desks in the maintenance shop; however, there is only one restroom, located in the main building. The present office space is severely inadequate, not to mention unsafe, to serve the mission of the refuge, the Complex, the Refuge System, or the needs of the public.

Given the presence of more than 30 million residents and visitors to Long Island, a headquarters and visitor center is essential to achieving the mission of the Service, the Refuge System, and the Complex. A new visitor center for the Complex was most appropriately located at Wertheim because of its central location among the

refuge units, its larger size, and its accessibility by major roads. Of the nearly 500,000 annual visitors to the Complex, more than 90,000 visited Wertheim in 2004. The Complex staff examined the potential for a visitor center on lands owned by other agencies. Those sites included the Southaven School, owned by the South Country School District, and the Robinson Duck Farm, owned by Suffolk County Parks. In both cases, the properties were not available for sale; therefore, they were eliminated from further consideration.

In 2000 and 2001, the Service evaluated four alternatives for a visitor center/staff office at Wertheim. An environmental assessment prepared in compliance with the NEPA and the Council on Environmental Quality Regulations provided a description of the purpose and need for the project, a brief background, the features of each alternative, the affected environment, and the effects and consequences of each alternative.

The selected alternative in that EA was a 6 acre site and residence adjacent to Wertheim on its eastern boundary. Our Regional Director approved the EA in February 2001, with the selection based on factors that included lower costs, less disturbance to the resources, and a relatively shorter time frame to complete the project. However, that site is no longer favored. The location of the new site can be found on map 4-2, and an aerial photograph is available in appendix G.

In our current analysis of site selection (see map 4-2) for the headquarters and visitor center, we applied this set of general criteria.

- Large enough site for all proposed facilities.
- On or easily accessible from Montauk Highway.
- Relatively close to the existing refuge entrance road to minimize additional costs and traffic impacts.
- Safe ingress/egress to the site for employees and visitors.
- Safe, adequate parking for employees and visitors.
- Located on refuge-owned property to improve the visibility of the Service and refuge, facilitate public contact, and eliminate the hassle of a difficult real estate market.
- Reasonable site development costs.
- Low ecological, cultural, and esthetic impacts.

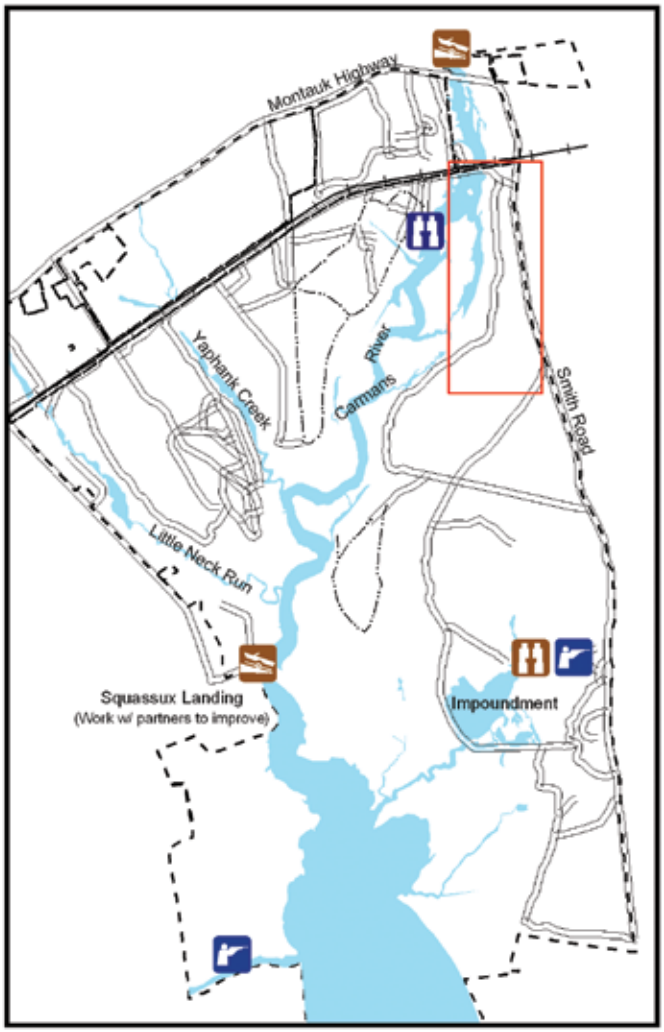
The proposed visitor center will also serve as office space for refuge employees. This action will involve constructing a new building at Wertheim across the Carmans River from the present office site. See Appendix G, “Conceptual Plans” for perspectives and floor plans for the proposed facility and an aerial view of the site. The site will have to be cleared of approximately 9 acres of pioneer hardwood vegetation, as well as a 30-vehicle parking lot. The proposed site currently has no structures. We will construct the entrance road on existing refuge lands where it cannot be seen from Smith Road residences. The visitor center will include 1,000 square feet of display area, an auditorium, classroom, and staff offices.

U.S. Fish & Wildlife Service

Wertheim National Wildlife Refuge
Suffolk County, New York

Map 4-2

Public Use Opportunities at Wertheim National Wildlife Refuge



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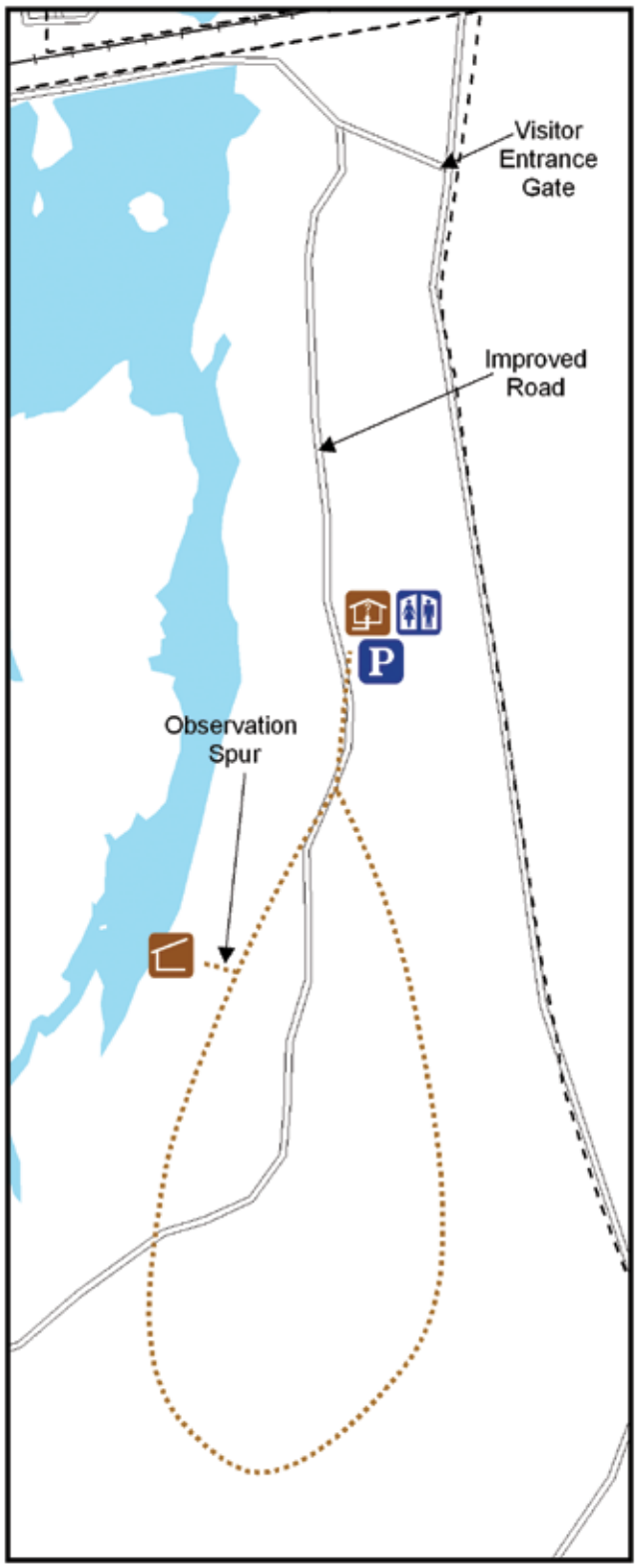
0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 Kilometers



1:5,428

0 0.1 0.2 Miles

0 0.1 0.2 0.3 Kilometers

N W E S

- New Visitor Center/ Headquarters
- Restrooms
- Improved Viewing Platform
- Observation Blind/ Proposed Goose Hunt Blind
- Boat Launch/ Fishing Access Site
- Education Pavillion/ Covered Shelter
- Resident Canada Goose Hunt Area
- Parking
- New Nature Trail
- Access Road
- Railroad
- Water
- Refuge Boundary

Produced by Long Island NWRC, Shirley, New York
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

Telephone and electric utilities will be brought onto the site from Smith Road, 0.1 miles distant. The public will gain access via the present refuge entrance at Smith Road, 0.3 miles south of Montauk Highway. The old office and the two office trailers now used as office space will be removed.

Access to the site by the public will remain as is. From the William Floyd Parkway or Montauk Highway, visitors will take Smith Road to the present refuge entrance. Smith Road is a secondary, neighborhood road. Visitors to the site will travel less than 0.3 miles on Smith Road until they enter the refuge, thus minimizing safety issues. Access for emergency responses by fire, medical and law enforcement agencies will still be available by all of the existing refuge entrances and fire roads. No government quarters will be located at the site of the proposed visitor center.

Visitors to the proposed visitor center will include students, natural resource groups, and members of the public interested in wildlife-dependent recreation, education, and interpretation. Refuge and visitor facility hours/days of operation and facility carrying capacity will be determined in consideration of wildlife/habitat, local residents, and staff constraints. Current sites of access to the refuge will also remain in operation, including the White Oak Nature Trail, the fishing access site maintained by the DEC on Montauk Highway, and the Beaver Dam/Squassux Landing site maintained by the Town of Brookhaven and a local community group.

Environmental education and interpretation sites accessible at the center will include a 0.5 mile nature trail through a mixed hardwood forest and on an existing fire road to an observation platform for viewing the refuge impoundment. Visitors who wish to use the White Oak Nature Trail at the present headquarters will be routed back out to the present entrance road.

Strategies

- Within 1 year, plan for the construction, interpretive design, and staffing of a new Complex visitor center/headquarters at Wertheim. The plans for the structure will follow closely those for a similar facility at the Rhode Island National Wildlife Refuge Complex.

- Within 1 year, begin the permit application process necessary for building construction along the Carmans River.

- Within 1 year, update existing Project Identification Document to reflect changes in facility and site selection from the 2000 Draft Environmental Assessment.

- Within 1 year of funding, work with interpretive planners to finalize the conceptual design of interpretive exhibits including messages, types of exhibits, visitor flow patterns, visitor carrying capacity, etc.

- Within 4 years of funding, complete exterior and interior construction of facility; this includes utilities, access, linking to and updating the nature trail and trail guide.

- By the grand opening of the new facility, update Complex brochures and interpretive panels available at the information kiosk according to plans devised for the new facility.

- Coinciding with the grand opening of the visitor facility, staff it with an outdoor recreation planner, a volunteer coordinator, and a law enforcement officer, as well as volunteers.
- Update existing buildings and have additional staff dedicated to Morton and Target Rock on a seasonal basis.
- Work with the Town of Oyster Bay and the DEC to explore the possibility of a shared, staffed Oyster Bay office.

Objective 3: Public Access to Refuge Lands

Allow public access to Complex units to the extent it will not adversely impact Federal trust resources or compromise human safety. At least 90% of refuge visitors and neighbors will be able to explain the purpose of access restrictions. Visitors will also be able to support habitat conservation by conducting themselves according to "Leave No Trace" principles.

Rationale

Our primary responsibility is to protect wildlife and promote wildlife conservation. Some sensitive areas require us to restrict public access to minimize disturbance, especially during the nesting season. Beach areas for beach-dependent nesting birds are partially closed late spring and summer to public use each year. No matter the level of access granted, visitor safety and resource protection take priority over all other activities. We have set up facilities for public visitation, including parking, restrooms, information kiosk, nature trails and guides on three refuges: Wertheim, Target Rock and Morton. Oyster Bay and Amagansett are open to visitors, but lack onsite facilities.

We grant special use permits for access to closed areas and closed units for certain activities, including research and photography, on a case-by-case basis when the activity will benefit the Complex. Access to closed areas and units is also granted to certain partners involved in cooperative agreements and memorandums of understanding to protect resources or enhance habitat.

Problems with trespassing, littering, and feeding wildlife on the refuges have become increasing problems in recent years. They adversely affect wildlife and their habitat and can pose a threat to public safety.

Sunbathing and beach use at Amagansett and Morton are allowable activities.

Strategies

- Continue to provide access to Complex units via visitor facilities, permits, and agreements as noted above.
- Continue to impose seasonal restrictions for the protection of shorebird nesting areas.
- Within 5 years, develop and implement a plan for increased patrols of refuge units, including strengthening and formalizing partnerships with local authorities, DEC Conservation Officers, and NYS Forest Rangers.

- Within 5 years, explore partnership with Long Beach School District, Nike Environmental Center, to provide facilities such as a boardwalk, and access to Lido Beach WMA for environmental education purposes.

- Within 15 years, provide access to the closed units of Seatuck, Sayville, and Conscience Point by exploring partnerships with the Towns of Islip and Southampton and other adjacent landownders, where access may involve our providing interpretive information kiosks and observation areas on properties adjacent to the refuges.

- Work with the Southampton Trails Preservation Society and other partners to explore the possibilty of opening and adding trails at Conscience Point. This must include detailing, inventorying, and mapping of sensitive habitats and species at the refuge to determine the appropriateness and compatibility of opening the refuge and adding trails.

Objective 4: Interpretation

Enhance interpretive opportunities at the Complex and update them according to the Visitor Services Plan. 90% of visitors will be able to identify the property as a national wildlife refuge and 80% will be able to identify at least one important Complex habitat type and relate its significance to migratory birds and other native wildlife.

Rationale

Interpretation is a priority public use in the Refuge System Improvement Act, and is one of the most important ways we can increase the visibility of the Complex, convey its mission, identify its significant contributions to wildlife conservation, and raise public understanding of the Service and its activities on Long Island. Recently, USFWS Region 5 identified "areas of emphasis" with regards to the six priority wildlife-dependent recreational uses for every refuge. The Long Island NWR Complex was identified for environmental education and interpretation. Thus, we will further consider this recognition as we implement the strategies of the CCP over the next 15 years.

Complex visitors often confuse us with county, state, or national parks. Many are unaware of the Refuge System and its scope, and most do not understand the importance of the Complex in the conservation of migratory birds and threatened or endangered species.

Proposed future programs will raise the visibility of the Service, the Refuge System, and the Complex through increased visitor contacts, onsite programs, and new and improved infrastructure. We want people to recognize that the Complex has as its priority managing a variety of habitats to benefit migratory birds, with particular emphasis on restoring habitat for threatened or endangered species. Expanding our interpretation program will give visitors a better understanding of that contribution. For example, we will work more closely with the NPS Sagamore Hill National Historic Site and Fire Island National Seashore on interpretive programs and displays that mutually benefit our respective agencies, wildlife, and public use.

We receive daily requests for guided interpretive programs. Although provisions for self-guided programs are available in an excellent nature trail guide and

activity guides, most group leaders who request guided programs prefer not to lead a program themselves.

Strategies

- Continue to maintain and provide facilities and materials including nature trails and guides, interpretive kiosks, activities guides to facilitate interpretation at Wertheim, Target Rock and Morton.
- Maintain partnerships with environmental education organizations that regularly use the Complex nature trails.
- Maintain our relationship with the Long Island Visitors Bureau & Sports commission, and keep the Complex website up-to-date.
- Continue to provide support and guidance to the Friends of Wertheim Programs Committee.
- Within 5 years, with partners, develop a detailed interpretive program for the refuge that tiers to the Visitor Services Plan.
- Within 5 years and every 3 years thereafter, evaluate the Complex interpretation program and update facilities and information to reflect its Visitor Services Plan.
- Within 5 years, coordinate with the Town of Oyster Bay, Friends of the Bay, The Waterfront Center and the Theodore Roosevelt Audubon Bird Sanctuary to develop interpretive exhibits and programs for Oyster Bay.
- Within 7 years, work with the National Park Service Sagamore Hill National Historic Site to develop a trail and interpretive overlook at Oyster Bay adjoining that property.
- Within 5 years, explore partnership opportunities with the National Park Service Fire Island National Seashore that utilize the shared skills, resources, and facilities of our two agencies, and we will cooperate in their upcoming General Management Plan process.
- Within 3 years, formalize partnerships with local Audubon Society Chapters and other environmental organizations to provide guided interpretive programs at Wertheim, Target Rock, and Morton refuges.
- Within 10 years, develop and implement portable displays and compact discs about refuge units and their management.
- Within 10 years, re-evaluate and renovate trails to make barrier free, and develop self-guided interpretive signs, including at restoration sites.
- Work with local canoe/kayak vendors to develop an interpretive self-guided tour of the Carmans River with an accompanying brochure.
- Within 15 years, interpret Amagansett, Seatuck, Sayville, and Conscience Point by exploring partnerships with the Towns of Islip and Southampton and other adjacent landownders, wherein the Complex may provide interpretive information kiosks and/or observation areas on properties adjacent to the refuge.

- Within 7 years, provide interpretation of all Complex units by constructing and maintaining a headquarters office/visitor facility that will host permanent and changing interpretive exhibits.

- Within 10 years, develop docent program with volunteers to staff visitor contact station at Morton and conduct interpretive programs.

- As funds allow, continue to hire and train student interns to provide guided interpretation to refuge visitors.

- In conjunction with the new visitor center, improve self-guided experience through thematic interpretive wayside exhibits on trails.

Objective 5: Wildlife Observation and Photography

Maintain the current wildlife observation and photography opportunities provided on the Complex. Provide an observation area at the Wertheim impoundment and explore partnerships with adjacent landowners of Seatuck, Sayville, and Conscience Point for possible observation areas on properties adjacent to the refuges. Ensure that 80% of adult visitors report they were satisfied with the Complex's efforts to provide safe and accessible opportunities to observe and photograph wildlife.

Rationale

Wildlife observation and photography are two of six priority public uses. Nassau and Suffolk counties contain hundreds of photography groups. We regularly receive requests for access to closed areas of the Complex, and issue special use permits on a case-by-case basis. Permission to use the images for refuge purposes is one requirement of those permits. The occasional photography workshops and birding programs that have been presented on Complex units open for public use have met with great success and large attendance. Enhancing those opportunities not only will serve to update the Complex library of images for outreach, educational, and historical purposes, but also will help build public understanding and support of Complex management.

Strategies

- Continue to maintain observation and photography platforms and blinds along the Complex nature trails at Wertheim, Target Rock and Morton; maintain and update spotting scopes at Wertheim, Target Rock and Morton as needed.

- Within 3 years, develop a nature photography club that can provide annual wildlife photography workshops. Offer an annual Friends group-sponsored wildlife photography contest.

- Review SUP fee policy for commercial wildlife photography primarily on closed refuge property.

- Continue to issue special use permits on a case-by-case basis for nature photography of benefit to the resource.

- Formalize partnerships with environmental organizations to provide photography and birding programs at Complex units.

- Continue to support and provide guidance to the Friends of Wertheim Programs Committee.

- Within 10 years, develop portable photography blinds and implement a reservation system.

- Within 15 years, provide access to the closed units of Seatuck, Sayville, and Conscience Point by exploring partnerships with the Towns of Islip and Southampton and other adjacent landownders, where access may involve our providing interpretive information kiosks and observation areas on properties adjacent to the refuges.

Objective 6: Environmental Education

Provide opportunities for partner-led and self-guided environmental education programs on Complex lands.

Rationale

Our staff encounters high demand for guided school programs and in-classroom programs, especially for Wertheim and Morton. During the school year, we receive at least three requests per week for guided educational programs. Most educators or group leaders prefer not to guide their own programs related to environmental science. Although we have provided quality programs and materials to teachers and group leaders, comments from the public indicate improvements are needed.

Strategies

- Continue to participate in and promote the Federal Junior Duck Stamp Program for New York State with Ducks Unlimited.

- Continue to issue fee waivers/special use permits to educational institutions for outdoor laboratory exercises.

- In conjunction with the new visitor center, develop and implement an outdoor classroom area at Wertheim adjacent to the new facility.

- Within 5 years, explore formalizing a partnership with Long Beach School District, Nike Environmental Center, to provide boardwalk facilities and access for environmental education purposes.

- Within 7 years, partner with local educational institutions to plan, develop, and implement teacher environmental education workshops utilizing Complex resources.

- Partner with local schools and other educational institutions to enhance utilization of Complex resources for environmental education.

- Partner with NGOs and academic institutions to develop a detailed, self-guided environmental education program for opened refuge units that tier to Visitor Servicess Plan.

- Within 5 years, develop a network of educators willing to assist in program/curriculum development for the Complex. This network would act as supporters of the Complex, advocates for environmental education, and as a liaison to the community.

- Develop/purchase educational materials/equipment for use by educational institutions.

- Within 10 years, expand teacher workshops to Target Rock and Morton.
- Develop education kits for scout leaders to use in conducting education programs at the Complex. Encourage use of refuge by scouts to earn official badges.
- Participate in environmental education events-Nassau Boces, Town of Oyster Bay.

Objective 7: Fishing

Promote fishing opportunities at Complex units through partnership with the New York State Department of Environmental Conservation, Suffolk and Nassau Counties, Town agencies and non-governmental organizations. We want 90% of partners and visitors, including those who visit our website, to be able to state that the Complex offers fishing on various units.

Rationale

Both freshwater and saltwater fishing opportunities are available at Wertheim and Oyster Bay, and saltwater fishing is available at Target Rock, Morton and Amagansett. Those units offer fishing from shore, although some fishing at Wertheim and Oyster Bay is restricted to boat access. Wertheim offers boat launching at the fishing access site on Montauk Highway, Route 27A/CR 80 for canoes and kayaks, and at Squassux Landing at the end of Beaver Dam Road in Brookhaven. Boat access at Oyster Bay is from town launches or from the Long Island Sound. Sportsmen and fish conservation groups including the New York Fishing Tackle Trade Association, Trout Unlimited, and the Suffolk Alliance of Sportsmen have shown considerable interest in improving fishing access at various Complex units, especially Wertheim. Over the past three years, interest has also improved in fishing workshops for nontraditional anglers, including kids and families.

Strategies

- formalize partnerships to promote fishing opportunities and habitat restoration projects on Complex units with state, county, town and non-government organizations. Promotion will include, but not be limited to, fishing events, media stories, and website information.
- Within 10 years, develop fish species and fishing regulation rack cards for use at Complex information kiosks and outreach packets.
- Within 3 years and each year thereafter, develop and implement a family fishing event for at least one Complex unit.
- Within 5 years, evaluate the opportunities on the Complex for nontraditional anglers, and make recommendations for improving access and opportunities as part of the Visitor Services Plan.
- Within 8 years, implement the fishing opportunity and access recommendations of the Visitor Services Plan.

As a step-down from the Visitor Services Plan

- within 5 years make recommendations to improve fishing access/opportunities. Implement the plans recommendations within 8 years.
- Explore opportunity and evaluate sites to provide shore-based public fishing opportunities where compatible and feasible.
- Construct at least one "barrier free" fishing structure.
- Improve fishing access site(s) at Wertheim north of Montauk Highway in partnership with the DEC, NYFTTA, and NY Department of Transportation.
- Within 5 years, improve the fishing access site at the end of Beaver Dam Road in partnership with the Town of Brookhaven.
- Integrate NY Department of State report on the south shore estuary.
- Design and develop interpretive displays or kiosks at fishing locations that teach visitors about responsible fishing, sensitive habitats, and the importance of a healthy ecosystem of fish and their associated habitats.

Objective 8: Hunting

Provide "safe" hunting opportunities on Complex lands as part of the effective and efficient management of upland and wetland habitats. "Safe" hunting entails that the number of accidents and incidents related to hunting on the Complex are less than New York State's average number of hunting-related accidents and incidents per year.

Rationale

Hunting is one of our six priority public uses. Hunting can be used as a tool for managing wildlife, unless we determine that safety concerns or overriding resource concerns will make hunting incompatible.

Reasons for establishing a hunt program are to (1) maintain a diversity of habitats in the Complex capable of supporting a diversity and abundance of wildlife species and, (2) provide wildlife-dependent recreational opportunities. The Service recognizes hunting as a healthy, traditional, outdoor pastime deeply rooted in our American heritage. When managed appropriately, hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs.

The draft policy for hunting on national wildlife refuges, issued in the Federal Register on January 16, 2001, describes a quality hunting experience. A quality hunting experience

(1) maximizes safety for hunters and other visitors;

(2) encourages the highest standards of ethical behavior in taking or attempting to take wildlife;

(3) is available to a broad spectrum of the hunting public;

(4) contributes positively to or has no adverse effect on population management of resident or migratory species;

(5) reflects positively on the individual refuge, the System, and the Service;

(6) provides hunters with un-crowded conditions by minimizing conflicts and competition among hunters;

(7) provides reasonable challenges and opportunities for taking targeted species under the described harvest objective established by the hunting program;

(8) minimizes the reliance on motorized vehicles and technology designed to increase the advantage of the hunter over wildlife;

(9) minimizes habitat impacts;

(10) creates minimal conflict with other priority wildlife-dependent recreational uses or Complex operations; and

(11) incorporates a message of stewardship and conservation in hunting opportunities.

The refuge will provide additional public hunting with an emphasis on waterfowl (i.e., early season/September resident Canada goose) hunting opportunities. For waterfowl, this could occur along the refuge shoreline of Bellport Bay, west of the mouth of the Carmans River. At this location, hunters will be required to provide their own temporary blinds and remove them each day. We may also establish one or two resident Canada goose hunt blinds at Wertheim located near the Big Fish Creek Impoundment. See map 4-2 for the proposed location. The blinds will be adequately placed to ensure a safe, quality experience and reduce the incidence of waterfowl being displaced from the refuge, and will be located a sufficient distance from nature trails to avoid visitor conflicts. Priority access to the blinds will be granted to youth and mobility-impaired hunters.

We are investigating the possibility of designing the blinds for multiple uses to include wildlife observation and photography.

The refuge will be closed to hunting except during specific "open" hunting dates between September 1 and September 30 established by annual rule. Hunting will occur on Wednesday and Saturday from one-half hour before sunrise until 12:00 noon. We will randomly select hunters for the program by lottery. The program will initially accommodate two hunters at each blind. We will allow hunting dogs for the purpose of retrieving birds, but they must be under the control of their owners at all times. Use of hunting dogs must also comply with state regulations.

We prepared a compatibility determination (included in appendix C of this document) that evaluated the compatibility of hunting with refuge purposes and the mission of the Refuge System.

Strategies

- Within 1 year, develop and begin to implement an outreach plan to educate the public and our partners about hunting on national wildlife refuges. Produce a Complex hunting brochure, including refuge regulations and maps and post similar information on the Complex website.

- Continue to inform the public and our partners about hunting on Complex units by personal communication, letters, press releases, and special events.

- Establish a monitoring protocol for evaluating the quality of the experience for hunters and non-hunters during various hunting seasons.
- Within 1 year, formalize partnerships with the DEC, as well as local Audubon Society chapters and sportsmen groups, to offer annual hunter education courses and hunter orientation programs for the Complex.
- Within 5 years, work with the DEC, DU, and other partners to promote current hunting programs for non-traditional sportsmen including women, youth, and disabled people.
- Within 5 years, work with partners to evaluate the feasibility of a limited duck hunt at Wertheim. Priority access will be granted to youth and disabled hunters.
- Within 5 years, work with the State/DU, towns, and other partners including adjacent landowners to resolve the issue of hunters on neigboring lands that come on Conscience Point refuge to retrieve waterfowl.
- Conduct routine law enforcement patrols of Complex lands both open and closed to hunting.
- Annually review the Hunt Plan and institute changes as appropriate to better meet management and safety goals.
- Identify dates when state- and federal-listed species are present to avoid take.

Goal 6.
Communicate and collaborate with local communities and partners throughout Long Island to promote the National Wildlife Refuge System and the Complex.

Objective 1: Outreach

Within 5 years, through community outreach, attain a 50% increase in the number of adults on Long Island that know the Complex exists and that it is part of the U.S. Fish and Wildlife Service's national system of refuges. These adults will also be able to identify our management priorities for migratory bird conservation and threatened and endangered species.

Rationale

This objective aims at developing an effective outreach program targeted at Long Island communities whose residents may not be aware that a national wildlife refuge is nearby. It is particularly important that local residents understand, appreciate, and support the mission of the Refuge System and the unique contribution of the Complex to that mission.

Strategies

- Maintain and regularly update contact information for partners, elected officials, the media, and the general public; keep the database current and user-friendly.
- Maintain refuge-specific fact sheets.
- Continue to inform refuge neighbors of refuge management activities via the website, press stories, and letters.

- Utilize volunteers to participate in community events on Long Island and in New York City where effective outreach of Complex programs can occur.
- Regularly work with media representatives to form personal working relationships; within 3 years, work with FWS External Affairs office to ensure that 6 articles or radio or TV spots about the Complex appear in national media highlighting refuge resources, issues, and management.
- Regularly promote successes via events, project demonstrations, and media stories.
- Within 5 years, develop survey protocol to measure success with meeting this objective.
- Within 5 years, develop an outreach plan, as part of the Visitor Services Plan, to outline direction for promoting the National Wildlife Refuge System and the Complex, and keeping neighbors and partners up to date about current projects and proposals. The plan could include provisions for publishing a newsletter or a regular column in a widely-read publication; utilize volunteers, interns and the Friends group for publication. Outreach will focus on recognized days such as, but not limited to, International Migratory Bird Day, National Wildlife Refuge Week, and National Boating and Fishing Week, as well as seasonal "happenings" on Complex units. The plan should capitalize on the Complex's proximity to the nation's media capital, New York City.
- Within 2 years, develop and implement an annual volunteer recruitment, training, and appreciation/recognition events.
- Within 3 years, develop and implement procedures to offer refuge "behind the scenes" tours to the media, elected officials, and the general public.
- After the proposed headquarters and visitor center opens, develop and implement a video/DVD about the Complex.
- Outreach to local kayak rental and sporting entities to limit trespass and related problems at the refuges.
- Within 5 years, evaluate partnerships to identify those that will benefit from formal MOUs/MOAs or cooperative agreements. This will help identify mutal goals, cost sharing, technical exchange, and environmental education and interpretation opportunities.
- Establish joint programs with other visitor centers/community gathering places and partners to support mutual work in natural resources i.e. NPS, towns.
- Work with partners to highlight work and successes; use media links e.g., websites.
- Maintain cooperative agreement with Brookhaven Volunteer Fire Department.
- Partner with the Cornell Cooperative Extension to use the Complex units as sites for their Master Birder and Master Naturalist Programs.
- Within 7 years, initiate a Friends group for Morton and Target Rock. Expand outreach to ensure visitors become more aware of Friends groups and how they can join. Develop recruitment strategies with the regional Friends coordinator. Formally recognize the contributions of Friends groups. Provide office and retail space, with cooperating agreement, for Friends groups at the proposed headquarters/visitor center at Wertheim (see goal 5, objective 2). Inform Friends group membership of opportunities to participate in biological and public use opportunities. Increase staff involvement with Friends group and vice versa.
- Continue working closely with and supporting the Friends of Wertheim and attending their board meetings.
- Within 10 years, recruit Friends Groups and volunteers to host annual events at Morton, Wertheim, and Target Rock.

Implementation, Monitoring, and Revision

Refuge Funding Needs

Successful implementation of the CCP relies on our ability to secure funding, personnel, infrastructure, and other resources to accomplish the actions identified. The recommended projects and their recurring costs, such as staff salaries, are listed and prioritized in the Refuge Operations Needs System (RONS) database (appendix E). In this appendix, we also identify new projects that we will include in the RONS database with the next annual update. The source of funding for these projects and salaries primarily comes from Refuge Operations (1261) dollars. Also, included in appendix E are our maintenance funding needs.

Some of the projects may be eligible for funding from the Refuge Roads Program (RRP) under the Transportation Equity Act for the 21st Century (TEA-21), a relatively new source of funding for the Refuge System. Examples include refuge public use roads, parking lots, bridges, restrooms, and trails. These funds can also be used for interpretive enhancements associated with these projects, as long as the costs for the interpretive facilities do not exceed 5% of the project budget. RRP funds can be used as the non-Federal match for Federal Highway Administration (FHA) funds available through State Departments of Transportation. Refuges can also use appropriated Service funds as the non-Federal match for these funds as well. This matching ability can be used tofurther compatible city, county, and State transportation and transit funds for projects on or near the refuge.

Staffing the Complex

The staff at Wertheim refuge will continue to administer the Complex (see appendix F). We will always ensure that visitors have a safe visit, engage in approved compatible activities, and understand and adhere to refuge regulations. Those include maintaining refuge boundary signs and continuing to make visitor contacts and conduct outreach and law enforcement. If RONS funding is not available, we will continue to seek alternate means of accomplishing our projects: for example, through volunteers, challenge cost share grants or other partnership grants, and interns. See table 3.7 for a list of established partners.

Monitoring and Evaluation

Monitoring and evaluating the implementation of this CCP will occur at two levels. The first level, which we refer to as implementation monitoring, responds to the question, “Did we do what we said we would do, when we said we would do it?”

The second level of monitoring, which we refer to as effectiveness monitoring, responds to the question, “Are actions we proposed effective in achieving the results we had hoped for?” Or, in other words, “Are the actions leading us toward our vision, goals, and objectives?” Effectiveness monitoring evaluates an individual action, a suite of actions, or an entire resource program. This approach is more analytical in evaluating management effects on species, populations, habitats, refuge visitors, ecosystem integrity, or the socio-economic environment. More often, the criteria to monitor and evaluate these management effects will be established in step-down, individual project, or cooperator plans, or through the research program. The Inventory and Monitoring Plan will be based on the needs and priorities identified in the HMP.

Adaptive Management

We will use a strategy of adaptive management to keep the CCP relevant and current through scientific research and management. We acknowledge that our information on species and ecosystems is incomplete, provisional, and subject to change as our knowledge base improves. The need for adaptive management is all the more compelling today.

> *"The earth's ecosystems are being modified in new ways and at faster rates than at any other time in their nearly 4 billion year history. These new and rapid changes present significant challenges to our ability to predict the inherently uncertain responses and behaviors of ecosystems." (Christensen, et al. 1996)*

Objectives and strategies must be adaptable in responding to new information and spatial and temporal changes. We will continually evaluate management actions, both formally and informally, through monitoring and research to reconsider whether their original assumptions and predictions are still valid. In this way, management becomes an active process of learning what really works. It is important that the public understand and appreciate the adaptive nature of natural resource management.

The Refuge Manager is responsible for changing management actions if they do not produce the desired conditions. Significant changes may warrant additional NEPA analysis; minor changes will not, but will be documented in annual monitoring, project evaluation reports, or the Annual Refuge Narrative.

Plan Amendment and Revision

Periodic review of the CCP will be required to ensure that objectives are being met and management actions are being implemented. Ongoing monitoring and evaluation will be an important part of this process. Monitoring results or new information may indicate the need to change our strategies.

At a minimum, CCPs will be fully revised every 15 years. We will modify the CCP documents and associated management activities as needed, following the procedures outlined in Service policy and NEPA requirements. Minor revisions that meet the criteria for categorical exclusions (550 FW 3.3 C) will only require an Environmental Action Memorandum.

John Mosesso, Jr./NBII

White-tailed deer are easily sighted at the Complex. Dense populations at the refuge have influenced the composition of plant communities.

Glossary

accessibility: the state or quality of being easily approached or entered, particularly as it relates to complying with the Americans with Disabilities Act.

accessible facilities: structures accessible for most people with disabilities without assistance.

alternative: a reasonable way to fix an identified problem or satisfy a stated need (40 CFR 1500.2). Alternatives are different means of accomplishing refuge purposes and goals, contributing to the System mission, and resolving issues. See **management alternative**.

anadromous: fish that spend a large proportion of their life cycle in the ocean and return to freshwater to breed.

angler: someone who fishes, primarily referring to fishing with hooks, and usually with no intent to sell.

anuran: or Salientian. Consists of frogs, toads and their close fossil relatives.

appropriate use: a proposed or existing use on a refuge that meets at least one of the following three conditions: (1) the use is a wildlife-dependent one; (2) the use contributes to fulfilling the refuge purpose(s), the System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act was signed into law; or (3) the use has been determined appropriate as specified in section 1.11 of that act.

approved acquisition boundary : a project boundary that the Director of the U.S. Fish & Wildlife Service approves upon completion of the planning and environmental compliance process. An approved acquisition boundary only designates those lands which the Service has authority to acquire or manage through various agreements. The approval of an acquisition boundary does not grant the Service jurisdiction or control over lands within the boundary, and it does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the System until the Service buys them or they are placed under an agreement that provides for their management as part of the System.

aquatic: growing in, living in, or dependent upon water.

Area of Biological Significance (ABS): contiguous landscapes, typically defined by watersheds or other geomorphologic feature, containing trust species and other species and habitats of special concern.

aquatic: growing in, living in, or dependent upon water.

Bailey System: technique for mapping ecoregions developed by Robert G. Bailey of the United States Department of Agriculture Forest Service.

barrens: a colloquial name given to habitats with sparse vegetation or low agricultural productivity.

benthic: living at, in or associated with structures on the bottom of a body of water.

best management practices: land management practices that produce desired results (i.e., usually describing forestry or agricultural practices effective in reducing non-point source pollution, like reseeding skidder trails or not storing manure in a flood plain. In their broader sense, practices that benefit target species).

bight: a bend in a coast forming an open bay, or a bay formed by such a bend.

biological diversity or biodiversity: the variety of life and its processes and includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

biological integrity: biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms and communities.

Bird Conservation Area (BCA): The New York State Bird Conservation Area Program was established in 1997 to safeguard and enhance bird populations and their habitats on State lands and waters. To date, twenty-eight BCAs have been designated. For more information: *http://www.dec.state.ny.us/website/dfwmr/wildlife/bca/*

bird conservation region (BCR): ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues (see *http://www.nabci-us.org/bcrs.html* for more information).

breeding habitat: habitat used by migratory birds or other animals during the breeding season.

buffer zones: protective land borders around critical habitats or water bodies that reduce runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals and plants and their habitats.

candidate species: see **Federally listed species**.

canopy: the uppermost spreading branchy layer of a forest.

canopy dominants: the major trees whose branches make up the canopy of a forest.

Categorical Exclusion (CE, CX, CATEX, CATX): a category of actions that do not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a Federal agency pursuant to the National Environmental Policy Act.

cation exchange capacity: an indicator of soil fertility. It shows the soil's ability to supply three important plant nutrients: calcium, magnesium and potassium. Any element with a positive charge is called a cation.

Challenge Cost Share Program: a grant program administered by the USFWS providing matching funds for projects supporting natural resource education, management, restoration and protection on Service lands, other public lands and on private lands.

Code of Federal Regulations (CFR): a compilation of all regulations issued by the agencies of the Federal government. It may be searched over the Internet at Exit from EPA pages *www.access.gpo.gov/nara/cfr/cfr-table-search.html*. Title 40 of the CFR ("40 CFR") contains regulations governing the environment.

community type: a particular assemblage of plants and animals, named for the characteristic plants.

compatible use: an allowed use that will not materially interfere with, or detract from, purposes for which the unit was established (Service Manual 602 FW 1.4).

compatibility determination: a compatibility determination is required for a wildlife-dependant recreational use or any other public use of a refuge. A compatible use is one which, in the sound professional judgement of the Refuge Manager, will not materially interfere with or detract from fulfillment of the Refuge System Mission or refuge purpose(s).

Complex or **the Complex:** see **National Wildlife Refuge Complex.**

Comprehensive Conservation Plan (CCP): a document that describes the desired future conditions of the refuge and provides long-range guidance and management direction to accomplish the purposes of the refuge, contribute to the mission of the System, and meet other relevant mandates. See *http://www.fws.gov/northeast/planning/*.

concern: see **issue.**

conservation: the management of natural resources to prevent loss or waste. Management actions may include preservation, restoration, and enhancement.

conservation easement: a legal agreement between a landowner and a land trust or government agency that permanently limits

a property's uses in order to protect its conservation values. A non-possessory interest in real property owned by another imposing limitations or affirmative obligations with the purpose of returning or protecting the property's conservation values.

cool-season grass: introduced grass for crop and pastureland that grows in spring and fall and is dormant during hot summer months.

cooperative agreement: the legal instrument used when the principal purpose of the transaction is the transfer of money, property, services or anything of value to a recipient in order to accomplish a public purpose authorized by Federal statute and substantial involvement between the Service and the recipient is anticipated.

Coordination Areas: defined as a "wildlife management area that has been withdrawn from the public domain or acquired by the Federal Government and subsequently made available to a state by cooperative agreement between the U.S. Fish & Wildlife Service and the state fish and wildlife agency, pursuant to the Fish and Wildlife Coordination Act of March 10, 1934 or the Bankhead Jones Act." See *http://www.fws.gov/refuges/faqs/CoordAreas.html*.

cover types: a non-technical higher-level floristic and structural description of vegetation cover.

critical habitat: according to U.S. Federal law, the ecosystems upon which endangered and threatened species depend.

cultural resource inventory: a professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).

degradation: the loss of native species and processes due to human activities such that only certain components of the original biodiversity persist, often including significantly altered natural communities.

Department of Environmental Conservation (DEC, NYSDEC): exists to *"conserve, improve, and protect New York State's natural resources and environment, and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well being."* See *http://www.dec.state.ny.us/* for more information.

Department of the Interior: the nation's principal conservation agency whose mission is to protect America's treasures for future generations, provide access to our nation's natural and cultural heritage, offer recreation opportunities, honor our trust responsibilities to American Indians and Alaska Natives and our responsibilities to island communities, conduct scientific research, provide wise stewardship of energy and mineral resources, foster sound use of land and water resources, and conserve and protect fish and wildlife. Interior is a large, decentralized agency with over **70,600** employees and **200,000** volunteers located at approximately **2,400** operating locations across the United States, Puerto Rico, U.S. territories, and freely associated states. See *http://www.doi.gov/* for more information.

designated wilderness area: an area designated by Congress as part of the National Wilderness Preservation System (FWS Manual 610 FW 1.5 draft). Also known as **wilderness**.

disturbance: any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.

duff: An organic surface soil layer below the litter layer in which the original form of plant and

animal matter cannot be identified with the unaided eye.

easement: an agreement by which a landowner gives up or sells one of the rights on his/her property. For example, a landowner may donate a right of way across his/her property to allow community members access to a river. See also conservation easement.

ecological processes: a complex mix of interactions among animals, plants, and their environment that ensures maintenance of an ecosystem's full range of **biodiversity**. Examples include population and predator-prey dynamics, pollination and seed dispersal, nutrient cycling, migration and dispersal.

ecoregion: a territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related interconnected ecosystems.

ecosystem: a natural community of organisms interacting with its physical environment, regarded as a unit.

ecotourism: visits to an area that maintains and preserves natural resources as a basis for promoting its economic growth and development.

ecosystem approach: a way of looking at socio-economic and environmental information based on ecosystem boundaries, rather than town, city, or county boundaries.

ecosystem-based management: an approach to making decisions based on the characteristics of the ecosystem in which a person or thing belongs. This concept takes into consideration interactions between the plants, animals, and physical characteristics of the environment when making decisions about land use or living resource issues.

emergent wetland: wetlands dominated by erect, rooted, herbaceous plants.

endangered species: a federally protected species which is in danger of extinction throughout all or a significant portion of its range.

endemic: native to and found only in a particular region. See also **indigenous species**, also referred to as **native**.

environmental education (EE): education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp et al. 1969).

environmental health: the composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

Environmental Assessment (EA): a concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact.

Environmental Impact Statement (EIS): a detailed written statement required by section 102(2)(C) of the NEPA, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-tern uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources.

estuaries: deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

estuarine wetlands: "The Estuarine system consists of deepwater tidal habitats and adjacent tidal wetlands that are usually

semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land" (Cowardin et al. 1979.

eutrophication: the process of nutrient enrichment in aquatic ecosystems. In marine systems, eutrophication results principally from nitrogen inputs from human activities such as sewage disposal and fertilizer use. The addition of nitrogen to coastal waters stimulates algal blooms and growth of bacteria, can cause broad shifts in ecological communities, and contribute to anoxic events and fish kills.

exotic species: a species that is not native to an area and has been introduced intentionally or unintentionally by humans; not all exotics become successfully established. Also known as **non-native species**.

extirpated: no longer occurring in a given geographic area.

Federal Aviation Administration (FAA): The government agency responsible for air safety and operation of the air traffic control system. Visit *http://www.faa.gov/* for more information.

Federal Fee Demonstration program: an experimental initiative that authorized the four federal land management agencies–the National Park Service, the Fish & Wildlife Service, the Bureau of Land Management and the U.S. Forest Service–to charge fees to visitors and keep the revenues for reinvestment into visitor facilities and services.

Federal land: public land owned by the Federal government, including lands such as National Forests, National Parks and National Wildlife Refuges.

Federally listed species or **Federal-listed species:** a species listed under the federal Endangered Species Act of 1973, as amended, either as endangered, threatened or species at risk. Formerly known as **candidate species**.

Federal Register (FR): The official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents. The Federal Register is published by the Office of the Federal Register, National Archives and Records Administration.

Finding of No Significant Impact (FONSI): a document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a Federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared.

fire regime: the characteristic frequency, intensity, and spatial distribution of natural fires within a given ecoregion or habitat.

fire return interval: the number of years between two successive fire events at a specific site or an area of a specified size.

floodplain: flat or nearly flat land that may be submerged by floodwaters; a plain built up or in the process of being built up by stream deposition.

flow regime: see **hydrologic regime**.

focus areas: within each Area of Biological Significance, focus areas further delineate concentrations or "hot spots" for species and habitats of special concern.

forb: a flowering plant, excluding grasses, sedges, and rushes, that does not have a woody stem and dies back to the ground at the end of the growing season.

fragmentation: the disruption of extensive habitats into isolated and small patches. Fragmentation has two negative components for biota: the loss of total habitat area; and, the creation of smaller, more isolated patches of habitat remaining.

fuel ladder: branches, shrubs, or an understory layer of trees, which allow a fire to spread from the ground to the canopy.

fuel loading: adding to the amount of available and potentially combustible material, usually expressed as tons/acre.

fulling mill: a mill which undertakes the process of fulling. Fulling is the beating and cleaning of cloth in water to shrink the loose fibers of the cloth, making it a denser fabric.

gallinaceous: of or relating to the order galliformes. Galliformes is an order of birds which are usually terrestrial, ground-nesting, rather large and heavy-bodied, have short wings and legs, a large crop, and a muscular gizzard, and produce numerous eggs and precocial young. The order includes the pheasants, turkeys, grouse, partridges, quails, and related birds.

geographic information system (GIS): a computerized system used to compile, store, analyze and display geographically referenced information. Can be used to overlay information layers containing the distributions of a variety of biological and physical features.

global positioning system (GPS): A worldwide radio-navigation system that was developed by the U.S. Department of Defense. GPS provides highly accurate position and velocity information, on a continuous global basis to an unlimited number of users. The system is unaffected by weather and provides a worldwide common grid reference system. The GPS receiver automatically selects appropriate signals from the satellites in view and translates these into three-dimensional position, velocity, and time. System accuracy for civil users is 100 meters horizontally.

goal: descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units.

grassland: a habitat type with landscapes dominated by grasses and with biodiversity characterized by species with wide distributions, communities being relatively resilient to short-term disturbances but not to prolonged, intensive burning or grazing. In such systems, larger vertebrates, birds, and invertebrates display extensive movement to track seasonal or patchy resources.

grist mill: a mill for grinding grain.

habitat: the place where a particular type of plant or animal lives. An organism's habitat must provide all of the basic requirements for life and should be free of harmful contaminants.

habitat conservation: the protection of an animal or plant's habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.

habitat fragmentation: breaking up of a specific habitat into smaller unconnected areas. A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.

habitat management plan (HMP): A site-specific wildlife habitat plan.

herbaceous: of, relating to, or having the characteristics of an herb; having little or no woody tissue.

herbivory: the loss of vegetation due to consumption by another organism.

historic conditions: the composition, structure and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human-related changes to the landscape.

host plant: the plant used for food by a specific species. Butterflies typically lay their eggs on the host plant used by the caterpillar. A single species of butterfly may use one or several species of plants as host plants.

hydrologic regime: characteristic fluctuations in river flows. Also known as **flow regime**.

impoundment: a body of water, such as a pond, confined by a dam, dike, floodgate, or other barrier, which is used to collect and store water for future use.

indicator species: a species used as a gauge for the condition of a particular habitat, community, or ecosystem. A characteristic or surrogate species for a community or ecosystem.

indigenous species: a species that, other than as a result of introduction, historically occurred or currently occurs in a particular ecosystem. See also **endemic**. Also referred to as **native** species.

interjurisdictional fish: populations of fish that are managed by two or more states or national or tribal governments because of the scope of their geographic distributions or migrations.

interpretive facilities: structures that provides information about an event, place or thing by a variety of means including printed materials, audiovisuals or multimedia materials. Examples of these would be kiosks which offer printed materials and audiovisuals, signs and trailheads.

interpretive materials: any tool used to provide or clarify information, explain events or things, or serve to increase awareness and understanding of the events or things. Examples of these would be: (1) printed materials such as brochures, maps or curriculum materials; (2) audio/visual materials such as videotapes, films, slides, or audio tapes; and (3) interactive multimedia materials, such as cd–rom and other computer technology.

invasability: the relative ability for an **invasive species** to negatively affect a given ecosystem. For example, an **invasive plant** like Asiatic bittersweet has high invasbility because it spreads rapidly, where black locust has low invasability because it spreads more slowly.

invasive species, invasive plants: non-native species which have been introduced into an ecosystem, and, because of their aggressive growth habits and lack of natural predators, displace native species. Invasive plants often spread from a single location, coalesce, and convert the native plant community into a uniform patch of invasive species. These invasive plant-dominated areas represent a much lower diversity of plant species and vegetation heights than would be found normally, and as such, are of reduced value to forest and grassland-dependent migratory birds.

invertebrate: any animal lacking a backbone or bony segment that encloses the central nerve cord.

issue: any unsettled matter that requires a management decision; e.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concerns, or the presence of an undesirable resource condition. Issues should be documented, described, and analyzed in the CCP even if resolution cannot be accomplished during the planning process (Service Manual 602 FW 1.4). Also referred to as **concern**.

Land Protection Plan (LPP): a document that identifies and prioritizes lands for potential Service acquisition from a willing seller, and also describes other methods of providing protection. Landowners within project boundaries will find this document, which is released with environmental assessments, most useful.

land trusts: private, nonprofit organizations dedicated to conserving land by purchasing land, receiving donations of lands, or accepting conservation easements from landowners.

Leave No Trace: "…to avoid or minimize impacts to natural area resources and help ensure a positive recreational experience for all visitors. America's public lands are a finite resource whose social and ecological values are linked to the integrity of their natural conditions and processes. Land managers face a perennial struggle in their efforts to achieve an appropriate balance between the competing mandates to preserve natural and cultural resources and provide high quality recreational use. Visitor education designed to instill low impact ethics and skills is a critical management component and is seen as a light-handed approach that can reduce the need for more

direct and regulatory forms of management." (Source: *http://www.lnt.org/about/history.html*)

lepidoptera: the insect order which includes butterflies and moths.

litter: the uppermost layer of organic debris on a forest floor, composed mainly of fresh or slightly decomposed leaves, bark, twigs, flowers, fruits, and other vegetable matter.

loafing: spending time in idleness.

local agencies: generally referring to municipal governments, regional planning commissions or conservation groups.

Long Island National Wildlife Refuge Complex (Complex or **the Complex) :** the internal Service administrative linking of Amagansett, Conscience Point, Morton, Oyster Bay, Seatuck, Target Rock, and Wertheim National Wildlife Refuges, along with Lido Beach Wildlife Management Area and the Sayville Unit. In this document, these are referred to as Amagansett, Conscience Point, Lido Beach, Morton, Oyster Bay, Seatuck, Sayville, Target Rock and Wertheim, i.e. without their associated designations. The Complex headquarters is located at Wertheim. Visit our web page at *http://www.fws.gov/northeast/longislandrefuges/*.

Long Island Wetland Restoration Initiative: partner agencies and organizations working together to restore tidal saltmarshes and native grassland habitat on Long Island. Visit *http://nyfo.fws.gov/info/cdreports/lifowetlandinitiative.pdf* for more info.

long term protection: mechanisms such as fee title acquisition, conservation easements or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintenance of the species population at the site.

management alternative: a set of objectives and the strategies needed to accomplish each objective (Service Manual 602 FW 1.4).

management plan: a plan that guides future land management practices on a tract of land. In the context of this environmental impact statement, management plans would be designed to produce additional wildlife habitat along with the primary products, such as timber or agricultural crops.

management strategy: a general approach to meet unit objectives. A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (Service Manual 602 FW 1.4).

mean high tide line: the average of all high tide lines.

mean high water: The average height of the high waters over a 19 year period.

Memorandum of Understanding (MOU): An agreement between agencies that states specific measures the agency will follow to accomplish a large or complex project.

mission statement: succinct statement of the unit's purpose and reason for being.

mitigation: actions taken to compensate for the negative effects of a particular project. Fore example, wetland mitigation usually takes the form of restoration or enhancement of a previously damaged wetland or creation of a new wetland.

moraine: a mass or ridge of earth scraped by ice and deposited at the edge of a glacier.

National Ambient Air Quality Standards (NAAQS): in the United States, national standards for the ambient concentrations in air of different air pollutants (e.g. ozone and particulate matter) designed to protect human health and welfare. Visit *http://epa.gov/ttn/naaqs/*.

National Environmental Policy Act of 1969 (NEPA): requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public parti- cipation in the planning and implementation of all actions.

Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision making (40 CFR 1500).

National Wildlife Refuge (refuge or **NWR):** a designated area of land, water, or an interest in land or water within the System, but does not include **Coordination Areas**. See **National Wildlife Refuge System**.

National Wildlife Refuge Complex: an internal Service administrative linking of refuge units closely related by their purposes, goals, ecosystem, or geopolitical boundaries. See also **Long Island National Wildlife Refuge Complex**.

National Wildlife Refuge System (Refuge System or **System):** all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction.

"The mission of the System is to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

Also see **National Wildlife Refuge** and *http://www.fws.gov/refuges/*.

native: see **endemic** and **indigenous species**.

native plant: a plant that has grown in the region since the last glaciation and occurred before European settlement.

neotropical migrant: birds, bats, or invertebrates that seasonally migrate between the neararctic and neotropics.

non-consumptive, wildlife-oriented recreation: wildlife observation and photography and environmental education and interpretation.

non-native species: see **exotic species**.

non-point source pollution: nutrients or toxic substances that enter water from dispersed and uncontrolled sites.

nontraditional angler: an individual or group not typically engaged in angling e.g, women, children, families. Also see **angler**.

Notice of Intent (NOI): a notice that an environmental impact statement will be prepared and considered. Published in the Federal Register.

objective: an objective is a concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining management strategies, monitoring refuge accomplishments, and evaluating the success of the strategies. Also, see unit objective.

occurrence site: a discrete area where a population of a rare species lives or a rare plant community type grows.

odonata: the insect order which includes dragonflies and damselflies.

old field: an area that was formerly cultivated or grazed and where woody vegetation has begun to invade. If left undisturbed, it will eventually succeed into a forest. Many old fields occur at sites marginally suitable for crop production or pasturing. Old fields are highly variable in the Northeast, depending on soil, land use history, and management.

Open Marsh Water Management (OMWM): a form of mosquito control that intends to eliminate the use of larvicides, by providing access for predaceous salt marsh fishes to mosquito breeding sites. Some techniques include filling ditches and creating tidal channels and open water ponds that simulate pre-ditching hydrologic features. OMWM techniques can potentially improve conditions for shorebirds and waterfowl within degraded salt marshes.

overbrowsing: the elimination of forest undergrowth by herbivores.

overstory: see **canopy**.

palustrine wetlands: "The Palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean–derived salts is below 0%" (Cowardin et al. 1979).

pannes: Calcareous, wet, interdunal depressions that form near the water table in interdunal areas.

Partners for Wildlife Program: a voluntary habitat restoration program undertaken by the Service in cooperation with other governmental agencies, public and private organizations, and private landowners to improve and protect fish and wildlife habitat on private lands while leaving the land in private ownership.

partnership: a contract or agreement entered into by two or more individuals, groups of individuals, organizations or agencies in which each agrees to furnish a part of the capital or some in–kind service, i.e., labor, for a mutually beneficial enterprise.

passerine: a bird of the order passeriformes, also known as "perching birds," or, less accurately, as "songbirds." Of the 10,000 or so extant species of birds, over half (~5,300) are perching birds. Perching birds have a worldwide distribution, with representatives on all continents except Antarctica, and reaching their greatest diversity in the tropics.

Payments in Lieu of Taxes: Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries (cf: Refuge Revenue Sharing Act of 1935, Chapter One, Legal Context).

piscivorous: feeding on fish.

planning area: a planning area may include lands outside existing planning unit boundaries currently studied for inclusion in the System and/or partnership planning efforts. It may also include watersheds or ecosystems that affect the planning unit.

planning team: planning teams are interdisciplinary in membership and function. Teams generally consist of a Planning Team Leader; Refuge Manager and staff biologists; and other appropriate specialists including social scientists, ecologists, and recreation specialists. Team members may come from our other programs and other Federal, Tribal, and State natural resource agencies. The planning team prepares the CCP.

population monitoring: assessments of the characteristics of populations to ascertain their status and establish trends related to their abundance, condition, distribution, or other characteristics.

prescribed fire: application of fire to wildland fuels, either by natural or intentional ignition, to achieve identified land use objectives (FWS Manual 621 FW 1.7).

priority public use: a compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.

private land: land that is owned by a private individual, group of individuals, or non–governmental organization.

private landowner: any individual, group of individuals or non–governmental organization that owns land.

private organization: any non–governmental organization.

proposed wilderness: an area of the Refuge System that the secretary of the Interior has recommended to the President for inclusion in the National Wilderness Preservation System. See **designated wilderness area**.

protection: mechanisms such as fee title acquisition, conservation easements or binding

agreements with landowners that ensure land use and land management practices will remain compatible with maintenance of the species population at the site.

public: individuals, organizations, and groups; officials of Federal, State, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in the Service issues and those who do or do not realize that Service decisions may affect them.

public involvement: a process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.

public land: land that is owned by the local, state, or Federal government.

purposes of the refuge: the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.

rare species: species identified for special management emphasis because of their uncommon occurrence within a location.

Record of Decision (ROD): a concise public document prepared by the Federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted–and if not, why they were not–and a summary of monitoring and enforcement where applicable for any mitigation.

refuge goals: descriptive, open-ended and often broad statements of desired future conditions that convey a purpose but do not define measurable units.

refuge lands: those lands in which the Service holds full interest in fee title, or partial interest such as easements.

restoration: management of a disturbed or degraded habitat that results in the recovery of its original state. For example, restoration may involve planting native grasses and forbs, removing shrubs, prescribed burning, or reestablishing habitat for native plants and animals on degraded grassland.

return intervals: see **fire return intervals**.

riparian: the interface between freshwater habitats and the terrestrial landscape.

riverine: within the active channel of a river or stream.

robust emergents: vigorous wetland vegetation which protrudes above the water level e.g. *Phragmites*, cattail.

runoff: water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.

sandplain grassland: dry grassland that has resisted succession due to fire, wind, grazing, mowing, or salt spray. Characterized by thin, acidic, nutrient-poor soils over deep sand deposits, sandplains primarily occur on the coast and off-coast islands, or inland, where glaciers or rivers have deposited sands.

site improvement: any activity that changes the condition of an existing site to better interpret events, places, or things related to a refuge e.g., improving safety and access, replacing non-native with native plants, refurbishing footbridges and trailways, and renovating or expanding exhibits.

sound professional judgement: an opinion or management decision formed by an individual, or group of individuals, whose work requires the application of theories, concepts, principles, and methodologies typically acquired through

completion of a bachelor's or post-bachelor's degree program. Such judgments often require consistent exercise of discretion.

Species of Special Concern: a species not on the federal list of threatened or endangered species, but a species for which the Service or one of its partners has concerns.

state-listed species: threatened or **endangered species** within a state's borders that may or may not also be federal-listed species. Also see **federally listed species**.

step-down management plans: plans that describe management strategies and implementation schedules. A series of plans dealing with specific management subjects; for example, croplands, wilderness, and fire (Service Manual 602 FW 1.4).

stopover habitat: habitat used during bird migration for rest and feeding.

strand habitat: a beach or very shallow coastal area dominated by shoreline processes, particularly wave processes.

strategy: a specific action, tool or technique or combination of actions, tools, and techniques used to meet unit objectives.

succession: natural, sequential change of species composition of a community in a given area.

surfactant: a material that facilitates and accentuates the emulsifying, wetting and other surface-modifying properties of substances.

symbolic fencing: Signs, rope, or any other markers that can be used to convey to the public that they are not permitted in a particular area.

threatened species: a federally protected species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

tributary: a stream or river that flows into a larger stream, river or lake.

trust resource: a resource held in trust for the people by the government through law or administrative act. A federal trust resource is one for which trust responsibility is given, in part, to the federal government through federal legislation or administrative act. Generally, federal trust resources are those considered to be of national or international importance no matter where they occur. Trust resources include, but are not limited to, endangered species and migratory birds and fish that regularly move across state lines. In addition to species, trust resources also include cultural resources protected through federal historic preservation laws and nationally important and threatened habitats–notably wetlands, navigable waters, and public lands such as state parks and national wildlife refuges.

trust species: see **trust resource**.

turbidity: refers to the extent to which light penetrates a body of water. Turbid waters have reduced light penetration, and therefore do not generally support net growth of photo-synthetic organisms.

understory: Plants such as small trees, bushes, herbs and grasses that grow below the **canopy** level in a forest.

unfragmented habitat: large blocks of unbroken habitat of a particular type.

unit objective: desired conditions which must be accomplished to realize a desired outcome. Objectives are the basis for determining management strategies, monitoring refuge accomplishments, and measuring the success of the strategies. Objectives should be attainable and time-specific and may be stated quantitatively or qualitatively (Service Manual 602 FW 1.4).

upland: any land that is not wetland.

U.S. Army Corps of Engineers (USACE): military and civilian engineers, scientists and other specialists that handle engineering and environmental matters. The USACE is made up of approximately 34,600 Civilian and 650 military members. Responsibilities include

planning, designing, building and operating water resources and other civil works projects; designing and managing the construction of military facilities for the Army and Air Force; and providing design and construction management support for other Defense and federal agencies. Visit *http://www.usace.army.mil/* for more information.

U.S. Fish & Wildlife Service (USFWS, FWS): The Service helps protect a healthy environment for people, fish and wildlife, and helps Americans conserve and enjoy the outdoors and our living treasures. The Service's major responsibilities are for migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish. Our mission is "*…working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.*" Visit *http://www.fws.gov/who/* for info.

vector-borne disease: disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas e.g., dengue fever, viral encephalitis, lyme disease, and malaria.

vernal pool: depressions holding water for a temporary period in the spring and used by a variety of amphibians for egg laying.

vision statement: concise statement of what the planning unit could be, or what we could do, in the next 10 to 15 years, based primarily upon the System mission and specific refuge purposes, and other relevant mandates.

warm-season grass: native prairie grass that puts on the most growth during summer when cool-season grasses are dormant.

watchable wildlife: all wildlife is watchable. A watchable wildlife program is a strategy to help maintain viable populations of all native fish and wildlife species by building an effective, well-informed constituency for conservation. Watchable wildlife programs are tools by which wildlife conservation goals can be met while at the same time fulfilling public demand for wildlife recreational activities. These activities do not include sport hunting, trapping or sport fishing.

watershed: the geographic area within which water drains into a particular river, stream or body of water. A watershed includes both the land and the body of water into which the land drains.

wetlands: The U.S. Fish & Wildlife Service's definition of wetlands states that "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water" (Cowardin et al 1979).

wilderness: see **designated wilderness area**.

wildlife management: the practice of manipulating wildlife populations, either directly through regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

Wildlife Management Area (WMA): land owned by New York State under the control and management of the DEC's Division of Fish, Wildlife and Marine Resources. These lands have been acquired primarily for the production and use of wildlife.

wildlife-dependent recreational use: a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation. These uses are the six priority general public uses of the Refuge System as established in the National Wildlife Refuge System Administration Act.

wildlife-oriented recreation: recreational activities in which wildlife is the focus of the experience. For example, sport hunting and fishing, and plant and animal viewing and photography.

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Seatuck National Wildlife Refuge

Bibliography

Allan, B.F., F. Keesing, and R.S. Ostfeld. 2003. Effect of forest fragmentation on Lyme disease risk. Conservation Biology 17:267-272.

Anderson, J. F., and L. A. Magnarelli. 1993. Natural history of Borrelia burgdorferi in vectors and vertebrate hosts. Pages 11–24 in H.S. Ginsberg, editor. Ecology and environmental management of Lyme disease. Rutgers University Press, New Brunswick, New Jersey.

Atlantic Coast Joint Venture. 2002. *http://www.acjv.org/*.

Audubon. 2003. Cooling the hotspots: protecting America's birds, wildlife, and natural heritage from invasive species. Audubon Report. Available at: *http://www.dfg.ca.gov/hcpb/species/nuis_exo/final%20invasives%20report.pdf*.

Augustine, D.J. and P.A. Jordan. 1998. Predictors of white-tailed deer grazing intensity in fragmented deciduous forests. J. Wildl. Manage. 62:1076-1085.

Bailey, R.G. 1995. Descriptions of the Ecoregions of the United States. U.S. Department of Agriculture, Forest Service. Misc. Publication 1391.

Barbour, M.G. and W.D. Billings. 1988. North American Terrestrial Vegetation. Cambridge University Press.

Barbour, M. G., J. H. Burk, W. D. Pitts, F. S. Gillium, and M. K. Schwartz. 1999. Terrestrial Plant Ecology, Third Edition. Benjamin Cummings, an imprint of Addison Wesley Longman, Inc..

Batcher, M.S. 2003. Analysis of historic aerial photographs to assess changes in cover and distribution of *Phragmites australis* at Wertheim National Wildlife Refuge, New York. Prepared for the U.S. Fish & Wildlife Service, Long Island Refuge Complex.

Blodget, B.G. 1978. The effect of off-road vehicles on least terns and other shorebirds. M.S. Thesis, University of Massachusetts, Amherst, MA.

Borg, P, and E. Shreeve. 1974. The Carmans River Story: A Natural and Human History. Privately printed.

Bouffard, S.H. 1982. Wildlife values versus human recreation: Ruby Lake National Wildlife Refuge. Trans. North American Wildlife and Natural Resources Conference 47:553-558.

Boyd, H.P. 1991. A Field Guide to the Pine Barrens of New Jersey. Plexus Publishing, Inc., Medford, NJ.

Boyd, H.P. and P.E. Marucci. 1979. Arthropods of the Pine Barrens. *In* Pine Barrens Ecosystem and Landscape. Rutgers University Press, NJ.

Bratton, S.P. 1979. Impacts of white-tailed deer on the vegetation of Cades Cove, Great Smokey Mountains National Park. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies. 33:305-312.

Brown, C.L. and R. Clark. 1968. Observations of dredging and dissolved oxygen in a tidal waterway. Water Resources Res. 4:1381-1384.

Brown, S.E. and G.R. Parker. 1997. Impact of white-tailed deer on forest communities within Brown County State Park, Indiana. Proc. Indiana Acad. Sci. 106:39-51.

Brown, Wennona. Date unavailable. Mosquito larvicide non-target organism effects. Prepared for the U.S. Fish & Wildlife Service Maryland Co-Op Unit.

Burger, J. 1981. The effect of human activity on birds at a coastal bay. Biological Conservation. 21:231-241.

Burger, J. 1986. The effect of human activity on shorebirds in two coastal bays in northeastern United States. Environmental Conservation. 13:123-130.

Burger, J. and M. Gochfeld. 1991. The Common Tern: Its Breeding Biology and Social Behavior. Columbia University Press, NY.

Carreker, R.G. 1985. Habitat suitability index models: least tern. FWS/OBS- Biological Report 82 (10.103).

Casey, D. and D. Hein. 1983. Effects of heavy browsing on a bird community in deciduous forest. J. Wildl. Manage. 47:829-836.

Central Pine Barrens Joint Planning and Policy Commission. 1996. Comprehensive Land Use Plan, Volume 2. *http://pb.state.ny.us/cpb_plan_vol2/vol2_chapter04.htm*.

Citizens Campaign for the Environment. 2003. Carmans River Study. *http://www.citizenscampaign.org/campaigns/brookhaven.htm*.

Clapp, R. B., D. Morgan-Jacobs and R.C. Banks. 1983. Marine Birds of the Southeastern United States and Gulf of Mexico; Part III, Charadriiformes. USFWS FWS/OBS.

Connecticut Department of Environmental Protection, Wildlife Bureau. 1988. Publication DR-11.

Conover, M.R. 1991. Herbivory by Canada geese: Diet selection and its effect on lawns. Ecological Applications 1:231-36.

Cowardin, L. M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. *http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm*. (Version 04DEC98).

Crow, G.E. 1982. New England's Rare, Threatened, and Endangered Plants. U.S. Department of the Interior, Fish & Wildlife Service, Northeast Region.

Cypher, B.L. and E.A. Cypher. 1988. Ecology and Management of White-tailed Deer in Northeaster Coastal Habitats: A Synthesis of the Literature Pertinent to National Wildlife Refuges from Maine to Virginia. USFWS Biological Report 88(15).

Debano, L F., D. G. Neary, and P. F. Folliot. 1998. Fire's Effects on Ecosystems. John Wiley and Sons, Inc., New York.

DeCalesta, D.S. 1994. Effects of white-tailed deer on songbirds within managed forests in Pennsylvania. J. Wildl. Manage. 58(4):711-718.

DeCalesta, D. 1997. Deer and ecosystem management. Pages 267-279 in W.J. McShea, H.B. Underwood, and J.H. Rappole, editors. The science of overabundance: deer ecology and population management. Smithsonian Institution Press, Washington, D.C.

Degroot, R.C., T.W. Popham, L.R. Gjovik, and T. Forehand. 1979. Distribution gradients of arsenic, copper, and chromium around preservative-treated wooden stakes. J. Env. Qual. 8:39-41.

Decker, D.J., and K.G. Purdy. 1988. Toward a concept of wildlife acceptance capacity in wildlife management. Journal of Wildlife Management. 58(4):711-718.

Dindal, D.L. 1979. Soil Arthropod Microcommunities of the Pine Barrens. *In* Pine Barrens Ecosystem and Landscape. Rutgers University Press, NJ.

Dunn, E.H. and D.J. Agro. 1995. Black Tern (*Chlidonias Niger*). *In* A. Poole and F. Gill (eds.) The Birds of North America, 147. Acad. Nat. Sci. Phil. and Amer. Ornith. Union, Washington D.C.

Dunn Engineering Associates. 1999. Traffic impact study for the Home Depot, Shirley, New York. Dunn Engineering Associates. Westhampton Beach, New York.

Edington, J.M and M.A. Edington. 1986. Ecology, recreation and tourism. Cambridge University Press. Cambridge, U.K..

Eltringham, S.K. 1984. Wildlife and Tourism. John Wiley and Sons, New York.

Final Compatability Policy Pursuant to the National Wildlife Refuge System Improvement

Act of 1997, Notice. Federal Register 65 (October 18, 2000): 62484-62496.

Fish D. 1993. Population ecology of Ixodes dammini. Pages 25-42 in Ginsberg H, ed. Ecology and management of Lyme disease. New Brunswick (NJ): Rutgers University Press.

Gibbs, J.P., J.R. Longcore, D.G. McAuley and J.K. Ringelman. 1991. Use of wetland habitats by selected nongame water birds in Maine. U.S. Fish Wildl. Serv., Fish Wildl. Res. 9.

Gibbs, J.P. and S.M. Melvin. 1992. Pied-billed grebe. Pp. 31-49 in K.J. Schneider and D. Pence, eds. Migratory nongame birds of management concern in the northeast. U.S. Fish Wildl. Serv.

Groot Bruinderink, G.W.T.A. 1989. The impact of wild geese visiting improved grasslands in the Netherlands. J. App. Ecol. 26:131-46.

Gutzwiller, K.J., R.T. Wiedenmann, K.L. Clements. 1997. Does human intrusion alter the seasonal timing of avian song during breeding periods? Auk. 114:55-65.

Healy, W.M., D.S. DeCalesta, and S.L. Stout. 1997. A research perspective on white-tailed deer overabundance in the northeastern United States. Wildl. Soc. Bull. 25(2):259-263.

Holt, D.W. and S.M. Leasure. 1993. Short-eared Owl. *In* The Birds of North America, No. 62 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, DC.

Hunter, M.L., Jr. 1975. Least tern breeding range extension in Maine. Auk 92(1):143-144.

Jones, J.M. and J.H. Witham. 1990. Post-translocation survival and movements of metropolitan white-tailed deer. Wildlife Society Bulletin 18:434-441.

Jordan, M.J., W. A. Patterson, III, and A. G. Windisch. 2003. Conceptual ecological models for the Long Island pitch pine barrens: implications for managing rare plant communities. Forest Ecology and Management 185:151-168.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin 19:243-248.

Kaiser, M.S., and E.K. Kaiser. 1984. Effects of river recreationists on green-backed heron behavior. J. Wildlife Management 48:561-567.

Kear, J. 1963. The agricultural importance of wild goose droppings. Wildfowl 14:72-77.

Keith, L.B., 1974. Some features of population dynamics in mammals. Trans. International Congress of Game Biologists, Stockholm. 11:17-58.

Kirkpatrick, H.J., A.M. LaBonte, and J.T. Semour. 2002. A shotgun-archery deer hunt in a residential community: evaluation of hunt strategies and effectiveness. Wildlife Society Bulletin 30:478-486.

Klein, M.L. 1989. Effects of high levels of Human Visitation on Foraging Waterbirds at J.N. "Ding" Darling NWR, Sanibel, Florida. Final Report to USFWS. 103pp.

Klein, M.L. 1993. Waterbird behavioral responses to human disturbances. Wildlife Society Bulletin. 21:31-39.

Knight, R.L. 1984. Responses of wintering bald eagles to boating activity. J. Wildlife Management 48:999-1004.

Krausman, P.R., L.K. Sowls, and B.D. Leopold. 1992. Revisiting overpopulated deer ranges in the United States. California Fish & Game Journal. 78:1-10.

Krohne, D. T., and G. A. Hoch. 1999. Demography of Peromyscus leucopus populations on habitat patches: the role of dispersal. Canadian Journal of Zoology 77:1247–1253.

Kroll, J.C., P.J. Behrman, and W.D. Goodrum. 1986. Twenty-seven years of overbrowsing: implications in white-tailed deer management. Pages 6-7 in The Ninth Annual Meeting of

the Southeast Deer Study Group. Gatlinburg, Tennessee.

Lane, R. S., J. Piesman, and W. Burgdorfer. 1991. Lyme Borreliosis: relation of its causative agent to its vectors and hosts in North America and Europe. Annual Review of Entomology 36:587–609.

Little, D. Date Unavailable. Personal Communication.

LoGiudice, K., R.S. Ostfeld, K.A. Schmidt, and F. Keesing. 2003. The ecology of infectious disease: Effects of host diversity and community composition on Lyme disease risk. Proceedings of the National Academy of Sciences 100:567-571.

Long Island Sound Study. 2001. Sound Health 2001: Status and Trends in the Health of Long Island Sound. Sponsored by the U.S. EPA, Connecticut Dept. of Environmental Protection, and NYDEC. Available at *http://www.longislandsoundstudy.net/*.

Ludwig, M., D. Rusanowsky, and C. Johnson-Hughes. 1997. The impact of installation and use of a pier and dock assembly on eelgrass (*Zostera marina*) at Star Island, Montauk, NY: Kalikow dock case study. NMFS. 23 pp.

Manny, B.A., W.C. Johnson, and R.G. Wetzel. 1994. Nutrient additives by waterfowl to lakes and reservoirs: Predicting their effects on productivity and water quality. Hydrobiologia 279:121-32.

Maryland Department of Natural Resources. 2003. Mute Swans in Maryland: A Statewide Management Plan. Annapolis, MD. 39 pp. *http://www.dnr.state.md.us/wildlife/finalmsplan.pdf.*

Mather, T. N. 1993. The dynamics of spirochete transmission between ticks and vertebrates. Pages 43–60 in H. S. Ginsberg, editor. Ecology and environmental management of Lyme disease. Rutgers University Press, New Brunswick, New Jersey.

McShea, W.J., and J.H. Rappole. 1992. White-tailed deer as keystone species within forested habitats of Virginia. Virginia J. Sci. 43:177-186.

Migratory Bird Conservation Act of 1929. (16 U.S.C. 715-715r).

Miller, S.G., R.L. Knight, and C.K. Miller. 1998. Influence of recreational trails on breeding bird communities. Ecological Applications. 8(1) 162-169.

Mulvihill, E.L., C.A. Francisco, J.B. Glad, K.B. Kaster, and R.E. Wilson. 1980. Biological impacts of minor shoreline structures on the coastal environment: state of the art review. USFWS. Biological Serv. Prog. FWS/OBS-77/51.

National Oceanic and Atmospheric Administration. Coastal Services Center. *http://www.csc.noaa.gov/crs/lca/app_ny.html*.

National Wildlife Refuge Improvement Act of 1997. (16 U.S.C. 668dd et seq.).

Ness, E. 2003. Oh, deer, exploding populations of white-tailed deer are stripping our forests of life. Discover pp.67-71

Newsday, Inc. Date unavailable. Long Island: Our Story. *http://www.newsday.com/community/guide/lihistory/*.

New York State Department of Environmental Conservation. 1999. Eastern Mud Turtle Fact Sheet. *http://www.dec.state.ny.us/website/dfwmr/wildlife/endspec/mutufs.html*.

New York State Department of Environmental Conservation. 2001. Division of Air Resources. *http://www.dec.state.ny.us/website/dar/reports/2001all.pdf*.

New York State Department of Environmental Conservation. 2003. List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State. *http://www.dec.state.ny.us/website/dfwmr/wildlife/endspec/etsclist.html*.

New York State Department of Environmental Conservation. 2004. New York Natural Heritage Program. *http://www.dec.state.ny.us/website/dfwmr/heritage/*.

New York State Department of Labor. Date unavailable. Focus on Long Island. *http://www.labor.state.ny.us*.

New York State Office of Parks, Recreation and Historic Preservation. 2003. Statewide Comprehensive Outdoor Recreation Plan 2003. *http://nysparks.state.ny.us/agency/scorp/*.

Niedzielski, S. 2002. "Terrapene carolina" (On-line), Animal Diversity Web. Accessed May 2006 at *http://animaldiversity.ummz.umich.edu/site/accounts/information/Terrapene_carolina.html*.

Norton, D.J., J. Organ, and T. Litwin. 1984. Habitat classification and cover type mapping for the Long Island National Wildlife Refuge Complex. U.S. Fish & Wildlife Service, Newton, MA.

Nupp, T. E., and R. K. Swihart. 1998. Effects of forest fragmentation on population attributes of white-footed mice and eastern chipmunks. Journal of Mammology 79:1234–1243.

Obrecht, H. Wildlife Biologist. Patuxent Research Refuge. U.S. Fish & Wildlife Service.

Olsvig, L. S., J. F. Cryan, and R. H. Whittaker. 1979. Vegetational gradients of the pine plains and barrens of Long Island, New York. IN Pine barrens ecosystem and landscape. Rutgers University Press, NJ.

Ostfeld R.S., C. G. Jones, and J.O.Wolff. 1996. Of mice and mast. Bioscience 46: 323-330.

Ostfeld R.S., F. Keesing. 2000a. Biodiversity and disease risk: the case of Lyme disease. Conservation Biology 14: 1523-1739.

Ostfeld, R.S. and F. Keesing. 2000b. The function of biodiversity in the ecology of vector-borne zoonotic diseases. Canadian Journal of Zoology 78:2061-2078.

Packer, Laurence. 1999. COSEWIC Status Report on the FROSTED ELFIN BUTTERFLY, *Callophrys* (Incisalia) *irus*. Committee on the Status of Endangered Wildlife in Canada.

Partners in Flight. 2000. Landbird Conservation Plan: Physiographic Area 9: Southern New England. Version 1.0. Availabe at *http://www.blm.gov/wildlife/pl_09sum.htm*.

Patterson, W. A., III, and K. E. Sassman. 1988. Indian fires in the prehistory of New England. *In* Holocene human ecology in northeastern North America. Plenum Press, New York.

Petranka, J. 1998. Salamanders of the United States and Canada. Washington and London: Smithsonian Institution Press.

Poff, N.L. 1997. Trout Unlimited's North America Salmonid Policy: science-based guidance for 21st century coldwater conservation. Trout Unlimited, Arlington, VA.

Porter, W.F. 1991. White-tailed deer in eastern ecosystems: implications for management and research in National Parks. Natural Resources Report NPS/NRSSUNY/NRR-91/05.

Reschke, C. 1990. Ecological Communities of New York State. New York State Department of Environmental Conservation, Natural Heritage Program. Albany, New York.

Russell, F.L. and N.L. Fowler. 1999. Rarity of oak saplings in savannas and woodlands of the eastern Edwards Plateau, TX. Southwest. Nat. 44:31-41.

Shafer, D.J. 1999. The effects of dock shading on the seagrass (*Halodule wrightii*) in Perdido Bay, Alabama. Estuaries. 22:936-943.

Short, F.T., and S. Wyllie-Echeverria. 1996. Natural and human induced disturbance of seagrasses. Env. Cons. 23:17-27.

Slotta, L.S. and K.J. Williamson. 1974. Estuarine impacts related to dredge spoiling. Sixth Dredging Seminar Rep. CDS-176.

Smith, A., S.R. Craven, & P.D. Curtis. 1999. Managing Canada geese in urban environments. Jack Berryman Institute Publication 16, and Cornell Cooperative Extension, Ithaca, New York USA. 42 pages.

Spinello, A. G., J. H. Nakao, R. Busciolano, R. B. Winowitch and V. K. Eagen. 1993. Water Resources Data, New York, Water Year 1992. U.S. Geological Survey Water-Data Report NY 92-2.

Stapp, W., D. Bennett, W. Bryan, J. Fulton, J. MacGregor, P. Nowak, J. Wan, R. Wall, and S. Havlick. 1969. The Concept of Environmental Education. *Journal of Environmental Education*. 1 (1), 30–31.

Stebbins, R. 1966. *A Field Guide of Reptiles and Amphibians.*. Cambridge: The Riverside Press.

Strole, T.A., and R.C. Anderson. 1992. White-tailed deer browsing: species preferences and implications for central Illinois forests. Natural Areas Journal 12:139-144.

Suffolk County Department of Health Services. Date unavailable. Unpublished data. For more information, visit *http://www.co.suffolk.ny.us/webtemp3.cfm?dept=6&id=1003*.

Swihart, R.K., P.M. Picone, A.J. DeNicola, and L. Corncelli. 1995. Ecology of urban and suburban white-tailed deer. Pages 35-44 in J.B. McAninch, editor, Urban deer-a manageable resource? Proceedings of the 1993 Symposium of the Central Section, The Wildlife Society.

Thompson, B.C., J.A. Jackson, J. Burger, L.A. Hill, E.M. Kirsch, and J.L. Atwood. 1997. Least tern. The Birds of North America.

Traill-Stevenson. A. 1988. Agricultural damage by geese. Game Conservation Annual Review 19:155-56.

USDA and VDGIF. 2000. Pre-Decisional Environmental Assessment. Deer damage management in the commonwealth of Virginia. Prepared by USDA, Animal and Plant Health Inspection Service, Wildlife Services, in conjunction with Virginia Department of Game and Inland Fisheries.

U.S. Environmental Protection Agency. 2002. Total Maximum Daily Load Report for Oyster Bay Harbor. *http://oaspub.epa.gov/pls/tmdl/enviro.control?p_list_id=NY-1702-0016&p_cycle=2002*.

U.S. Fish & Wildlife Service. 1985. Refuge Manual. Wash., D.C. U.S. Gov't Printing Office.

U.S. Fish & Wildlife Service. 1989. Sandplain Gerardia (*Agalinis acuta*) Recovery Plan. Region 5, Newton Corner, MA. 47 pp. *http://ecos.fws.gov/tess_public/SpeciesRecovery.do?sort=1*

U.S. Fish & Wildlife Service. 1990. Regional Wetlands Concept Plan: Emergency Wetlands Resources Act. Northeast Region. Newton Corner, MA.

U.S. Fish & Wildlife Service. 1991. Northeast Coastal Areas Study: Significant Coastal Habitats of Southern New England and Portions of Long Island, New York. Southern New England–Long Island Sound Coastal and Estuary Office, Charlestown, RI.

U.S. Fish & Wildlife Service. 1992. Station Management Plan–Long Island, NY National Wildlife Refuges. Unpubl. Rept.

U.S. Fish & Wildlife Service. 1995. Migratory Nongame Birds of Management Concern in the United States: The 1995 List. *http://migratorybirds.fws.gov/reports/speccon/tblconts.html*.

U.S. Fish & Wildlife Service. 1996a. Piping Plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Region 5, Hadley, MA. *http://ecos.fws.gov/tess_public/SpeciesRecovery.do?sort=1*

U.S. Fish & Wildlife Service. 1996b. Significant Habitats and Habitat Complexes of the New York Bight Watershed. Southern New England – New York Bight Coastal Ecosystems Program. Charlestown, Rhode Island. Pre-publication copy.

U.S. Fish & Wildlife Service. 1997. Museums: Policy, Responsibilities, and Definitions. In Service Manual. 126 FW 1. *http://www.fws.gov/policy/126fw1.html.*

U.S. Fish & Wildlife Service. 1998. Roseate Tern (*Sterna dougallii*) Northeastern Population Recovery Plan. First Update. 75 pp. *http://ecos.fws.gov/tess_public/SpeciesRecovery.do?sort=1*

U.S. Fish & Wildlife Service. 2000. North American Bird Conservation Initiative. Supplement to the NABCI Bird Conservation Regions map. Arlington, VA.

U.S. Fish & Wildlife Service. 2001. Fire Management handbook. *http://fire.r9.fws.gov/fm/policy/HANDBOOK/2-3.HTM*.

U.S. Fish & Wildlife Service. 2004. Migratory Bird Program Strategic Plan. *http://migratorybirds.fws.gov/mbstratplan/MBStratPlanTOC.htm*.

U.S. Fish & Wildlife Service. 2005. Final Environmental Impact Statement on Resident Canada Goose Management. *http://www.fws.gov/migratorybirds/issues/cangeese/finaleis.htm*.

U.S. Fish & Wildlife Service. 2005. State Wildlife Grants. *http://federalaid.fws.gov/swg/swg.html*.

U.S. Shorebird Conservation Plan. 2000. North Atlantic Regional ShorebirdPlan, Version 1.0. NJ Division of Fish & Wildlife, Woodbine, NJ.

Van Buskirk, J., and R.S. Ostfeld. 1995. Controlling Lyme disease by modifying the density and species composition of tick hosts. Ecological Applications 5(4):1133-1140.

Van Deelen, T.R., K.S. Pregitzer, and J.B. Haufler. 1996. A comparison of presettlement and present-day forests in two northern Michigan deer yards. Am. Midl. Nat. 135:181-194.

Vaughan, D. M., and M. D. Shepherd. 2005. Species Profile: *Mitoura hesseli*. In Shepherd, M. D., D. M. Vaughan, and S. H. Black (Eds). *Red List of Pollinator Insects of North America*. CD-ROM Version 1 (May 2005). Portland, OR: The Xerces Society for Invertebrate Conservation.

Vickery, P. D. and P. W. Dunwiddie. 1997. Grasslands of Northeastern North America: Ecology and Conservation of Native and Agricultural Landscapes. Massachusetts Audubon, Lincoln, MA.

Villani, R. 1997. Long Island: A Natural History. Harry Abrams Publishing, New York.

Wacker, P. O. 1979. Human exploitation of the New Jersey Pine Barrens before 1900. IN Pine barrens ecosystem and landscape. Rutgers University Press.

Wagner, F.H., R. Foresta, R.B. Gill, D.R. McCullough, M.R. Pelton, W.F. Porter, and H. Salwasser. 1995. Wildlife policies in the U.S. national Parks. Island Press. 242 pp.

Wall, T. 1984. Summer foods of feral greylag and Canada geese. British Birds 77:355.

Waller, D.M., and W.S. Alverson. 1997. The white-tailed deer: a keystone herbivore. Wildlife Society Bulletin. 25:217-226.

Warren, R.J. 1991. Ecological justification for controlling deer populations in eastern national parks. Transactions of the 56th North American Wildlife & Natural Resources Conference. P. 56-66.

Weiss, J.S. and P. Weis. 1994. Impacts of chromated-copper-arsenate (CCA)-treated wood in shallow water estuarine systems. Proc. Marine and estuarine shallow water science and management in the mid-Atlantic. Pg. 19.

Whitaker, J. Jr., and W. Hamilton Jr. 1998. Mammals of the Eastern United States. Ithaca and London. Cornell University Press.

Wolfe, R. J. 1996. Effects of open marsh water management on selected tidal marsh resources: a review. Journal of the American Mosquito Control Association 12(4):701-712.

Wolff, J.O. 1999. Behavioral Model Systems. *In* G.W. Barrett and J.D. Peles (Eds). Landscape Ecology of Small Mammals. Springer-Verlag, New York.

Woolf, A., and J.D. Harder. 1979. Population dynamics of a captive white-tailed deer herd with emphasis on reproduction and mortality. Wildlife Monographs 67:53.

Zieman, J.C. 1976. The ecological effects of physical damage from motor boats on turtle grass beds in southern Florida. J. Aquatic Botany. 2:127-139.

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Great egrets rely on wetlands for feeding and nesting.

Appendix A

Species Lists and Threatened or Endangered Species

- Bird Species of the Complex
- Mammal Species of the Complex
- Reptile and Amphibian Species of the Complex
- Fish Species of the Complex
- Butterfly Species of the Complex
- Threatened or Endangered Species

Bird Species of the Complex

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Red-Throated Loon *Gavia stellata*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	s AW
Common Loon (Sc) *Gavia immer*	s AW	s AW	s AW	sSAW	s AW		s AW	s AW	sSAW
Horned Grebe *Podiceps auritus*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	s AW
Red Necked Grebe *Podiceps grisegena*							s AW		s AW
Eared Grebe *Podiceps nigricollis*				s AW					
Pied-billed Grebe*(St) *Podilymbus podiceps*		s AW	s AW	s AW	s AW		sSAW	sSAW	sSAW*
Great Cormorant *Phalacrocorax carbo*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	s AW
Double-crested Cormorant *Phalacrocorax auritus*	sSAW	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW	sSAW
Brown Pelican *Pelecanus occidentalis*	S								S
Northern Gannet *Morus bassanus*	s AW		s AW	s AW				s AW	s AW
Brown Booby *Sula leucogaster*	S								
American Bittern* (Sc) *Botaurus lentiginosus*		s AW	s AW	s AW	s AW		sSAW*	s AW	sSAW*
Least Bittern*(St) *Ixobrychus exilis*							sSA*		sSAW*
Great Blue Heron *Ardea herodias*	s AW	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW	sSAW
Great Egret *Casmerodius albus*	sSA	sSA	sSAW	sSA	sSA		sSA	sSA	sSAW
Snowy Egret *Egretta thula*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Little Blue Heron *Egretta caerulea*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Tricolored Heron *Egretta tricolor*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Cattle Egret *Bubulcus ibis*		SA	SA	SA	SA		SA	SA	SA
Green Heron* *Butorides striatus*	sSA	sSA *	sSA *	sSA *	sSA *		sSA *	sSA *	sSA *

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Black-crowned Night-Heron* *Nycticorax nycticorax*	sSAW	sSAW	sSAW*	sSAW	sSAW		sSAW	sSAW	sSAW
Yellow-crowned Night- Heron* *Nycticorax violacea*	sSA	sSA	sSA	sSA	sSA		sSA	sSA *	sSA
Glossy Ibis *Plegadis falcinellus*		sSA	sSA	sSA	sSA		sSA	sSA	sSA
Tundra Swan *Cygnus columbianus*					s AW				s AW
Mute Swan* *Cygnus olor*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*		sSAW*	sSAW*	sSAW*
Snow Goose *Chen caerulescens*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Brant *Branta bernicla*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Canada Goose* *Branta canadensis*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW	sSAW*	sSAW*	sSAW*
Wood Duck* *Aix sponsa*		sSA *		sSA *	sSA *		sSA *	sSA *	sSAW*
Green-winged Teal* *Anas crecca*		s AW	s AW	s AW	s AW		s AW	s AW	sSAW*
American Black Duck* *Anas rubripes*	s AW	sSAW*	sSAW*	sSAW*	sSAW*	s AW	sSAW*	sSAW*	sSAW*
Mallard* *Anas platyrhynchos*	s AW	sSAW*	sSAW*	sSAW*	sSAW*	s AW	sSAW*	sSAW*	sSAW*
Northern Pintail *Anas acuta*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Blue-winged Teal* *Anas discors*		s A	s A	s A	s A		sSAW	s AW	sSAW*
Northern Shoveler *Anas clypeata*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Gadwall* *Anas strepera*		sSAW	sSAW	sSAW	sSAW*		sSAW*	s AW	sSAW*
American Widgeon* *Anas americana*		s AW	s AW	s AW	s AW		s AW	s AW	sSAW*
Canvasback *Aythya valisineria*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Redhead *Aythya americana*			s AW		s AW		s AW	s AW	s AW
Ring-necked Duck *Aythya collaris*		s A	s A	s A	s AW		s A	s A	s AW

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Greater Scaup *Aythya marila*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Lesser Scaup *Aythya affinis*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Common Eider *Somateria mollissima*	s AW			s AW				s AW	
Harlequin Duck *Histrionicus histrionicus*	s AW			s AW					
Oldsquaw *Clangula hyemalis*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	sSAW
Black Scoter *Melanitta nigra*	s AW			s AW	s AW			s AW	
Surf Scoter *Melanitta perspicillata*	s AW			s AW	s AW			s AW	
White-winged Scoter *Melanitta fusca*	s AW	s AW		s AW	s AW		s AW	s AW	s AW
Common Goldeneye *Bucephala clangula*	s AW	s AW		s AW	s AW		s AW	s AW	s AW
Bufflehead *Bucephala albeola*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	sSAW
Hooded Merganser *Lophodytes cucullatus*		s AW	s AW	s AW	s AW		s AW	s AW	sSAW
Common Merganser *Mergus merganser*			s AW		s AW		s AW		s AW
Red-breasted Merganser* *Mergus serrator*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	sSAW*
Ruddy Duck *Oxyura jamaicensis*		s AW	s AW	s AW	s AW		s AW	s AW	s AW
Turkey Vulture *Cathartes aura*					sSA	sSA	sSA		sSA
Black Vulture *Coragyps atratus*						sSA			sSA
Osprey* (Sc) *Pandion haliaetus*	sSA	sSA	sSA*	sSA*	sSA*	sSA	sSA*	sSA	sSA*
Bald Eagle (Ft, St) *Haliaeetus leucocephalus*				s AW	s AW		s AW		sSAW
Northern Harrier*(St) *Circus cyaneus*	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW*
Sharp-shinned Hawk (Sc) *Accipiter striatus*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	sSAW

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Cooper's Hawk* (Sc) *Accipiter cooperii*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	sSAW*	sSAW*
Northern Goshawk (Sc) *Accipiter gentilis*		s AW		s AW			s AW	s AW	s AW
Red-shouldered Hawk* (Sc) *Buteo lineatus*		s A		s A			s A	s A	sSA*
Broad-winged Hawk* *Buteo platypterus*	s A	s A	s A	sSA*	s A	s A	s A	s A	sSA*
Red-tailed Hawk* *Buteo jamaicensis*	sSAW	sSAW*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Rough-legged Hawk *Buteo lagopus*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Golden Eagle (Se) *Aquila chrysaetos*					W				W
American Kestrel* *Falco sparverius*	sSAW	sSAW*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Merlin *Falco columbarius*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Peregrine Falcon (Se) *Falco peregrinus*	s AW	s AW	s AW	s AW	s AW	s AW	sSAW	s AW	sSAW
Gyrfalcon *Falco rusticolus*					s AW				s AW
Swallow-tailed Kite *Elanoides forficatus*									sSA
Ring-necked Pheasant * *Phasianus colchicus*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Ruffed Grouse* *Bonasa umbellus*									sSAW*
Northern Bobwhite* *Colinus virginianus*	sSAW*	sSAW*		sSAW*		sSAW*	sSAW*	sSAW*	sSAW*
Wild Turkey* *Meleagris gallopavo*		sSAW*							sSAW*
Black Rail (Se) *Laterallus jamaicensis*							A		sSA
Clapper Rail* *Rallus longirostris*		sSA	sSAW*	sSA	sSA *		sSA	sSA	sSAW*
King Rail (St) *Rallus elegans*		s A	s A	s A					s A
Virginia Rail* *Rallus limicola*		sSA	sSA	sSA *	sSA		sSA *	sSA	sSAW*

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Sora *Porzana carolina*		s A	s A	s A	s A		s A	s A	s A
American Coot* *Fulica americana*		s AW	s AW	s AW	s AW		s AW	s AW	sSAW*
Common Gallinule* *Gallinula chloropus*							SA		sSA *
Purple Gallinule *Porphyrula martinica*									SA
Yellow Rail *Coturnicops noveboracensis*									
Corn Crake *Crex crex*									
Black-bellied Plover *Pluvialis squatarola*	sSAW	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW	sSAW
Lesser Golden Plover *Pluvialis dominica*	s A	s A	s A	s A	s A		s A	s A	s A
Wilson's Plover *Charadrius wilsonia*				S					
Semipalmated Plover *Charadrius semipalmatus*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Piping Plover*(Ft, Se) *Charadrius melodus*	sSA			sSA *	sSA			sSA*	
Killdeer* *Charadrius vociferus*	sSA *	sSA *	sSA *	sSA *	sSA *	sSA	sSA *	sSA	sSA *
American Oystercatcher *Haematopus palliatus*	sSA	sSA	sSAW	sSAW	sSA		sSA	sSA	sSAW
Greater Yellowlegs *Tringa melanoleuca*	sSAW	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW	sSAW
Lesser Yellowlegs *Tringa flavipes*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Solitary Sandpiper *Tringa solitaria*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Spotted Sandpiper* *Actitis macularia*	s SA	sSA	sSA	sSA *	sSA		sSA	sSA	sSA *
Willet* *Catoptrophorus semipalmatus*	sSA	sSA *	sSA *	sSA *	sSA *		sSA *	sSA	sSA *
Whimbrel *Numenius phaeopus*		sSA	sSA	sSA					sSA
Ruddy Turnstone *Arenaria interpres*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Red Knot *Calidris canutus*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Marbled Godwit *Limosa fedoa*			S				S		S
Hudsonian Godwit *Limosa haemastica*			sSA	sSA					sSA
Sanderling *Calidris alba*	sSAW	sSA	sSAW	sSAW	sSAW		sSA	sSAW	sSA
Semipalmated Sandpiper *Calidris pusilla*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Western Sandpiper *Calidris mauri*	s A	s A	sSA	sSA	s A		s A	s A	s A
Least Sandpiper *Calidris minutilla*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
White-rumped Sandpiper *Calidris fuscicollis*	SA	SA	sSA	SA	SA		SA	S	SA
Pectoral Sandpiper *Calidris melanotos*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Purple Sandpiper *Calidris maritima*				W					
Dunlin *Calidris alpina*	sSAW	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW	sSAW
Stilt Sandpiper *Micropalama himantopus*		sSA	sSA	sSA			sSA		sSA
Short-billed Dowitcher *Limnodromus griseus*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Common Snipe *Capella gallinago*	s AW	s AW	s AW	s AW	s AW		s AW	s AW	sSAW
American Woodcock* *Philohela minor*	s AW	s AW	s AW	sSAW*	s AW	s AW	s AW	s AW	sSAW*
Northern Phalarope *Phalaropus lobatus*			sSA					sSA	sSA
Red Phalarope *Phalaropus fulicarius*			sSA						sSA
Wilson's Phalarope *Phalaropus tricolor*			sSA					sSA	sSA
Upland Sandpiper (St) *Bartramia longicauda*						sSA	sSA		sSA
Parasitic Jaeger *Stercorarius parasiticus*								SA	

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Laughing Gull *Larus atricilla*	sSA	sSA	sSAW	sSAW	sSA		sSA	sSA	sSAW
Herring Gull *Larus argentatus*	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW
Ring-billed Gull *Larus delawarensis*	sSAW	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW	sSAW
Iceland Gull *Larus glaucoides*			W	W	W				W
Lesser Black-backed Gull *Larus fuscus*				W	W				
Glaucous Gull *Larus hyperboreus*				W	W				W
Great Black-backed Gull *Larus marinus*	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW	sSAW
Ivory Gull *Pagophila eburnea*									
Caspian Tern *Sterna caspia*				A					A
Royal Tern *Sterna maxima*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Roseate Tern (Fe, Se) *Sterna dougallii*	sSA		sSA	sSA			sSA		sSA
Arctic Tern *Sterna paradisaea*				sS					
Common Tern* (St) *Sterna hirundo*	sSA	sSA	sSA	sSA *	sSA		sSA	sSA	sSA
Forster's Tern *Sterna forsteri*	SA	SA	SA	SA	SA		SA	SA	SA
Least Tern* (St) *Sterna albifrons*	sSA	sSA	sSA	sSA *	sSA		sSA	sSA	sSA
Black Tern (Se) *Chlidonias nigra*				s				S	A
Black Skimmer (Sc) *Rynchops niger*	sSA	sSA	sSA	sSA	sSA		sSA	sSA	sSA
Gull-billed Tern *Gelochelidon nilotica*									s
Black-legged Kittiwake *Rissa tridactyla*									
Rock Dove* *Columba livia*	sSAW	sSAW	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW	sSAW*

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Mourning Dove* *Zenaida macroura*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Monk Parakeet *Myiopsitta monachus*									sSAW
Budgerigar *Melopsittacus undulatus*									sSAW
Black-billed Cuckoo* *Coccyzus erythropthalmus*	sSA *	sSA *	sSA *	sSA *	sSA	sSA *	sSA *	sSA *	sSA *
Yellow-billed Cuckoo* *Coccyzus americanus*	sSA *	sSA *	sSA	sSA *	sSA	sSA *	sSA *	sSA *	sSA *
Barn Owl* *Tyto alba*	sSAW	sSAW	sSAW	sSAW		sSAW	sSAW		sSAW*
Eastern Screech Owl* *Otus asio*	sSAW*	sSAW*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Great Horned Owl* *Bubo virginianus*	sSAW	sSAW*		sSAW*	sSAW*	sSAW	sSAW*	sSAW*	sSAW*
Snowy Owl *Nyctea scandiaca*	s AW			s AW	s AW				s AW
Long-eared Owl *Asio otus*	s AW	s AW	s AW	s AW		s AW	s AW		sSAW
Short-eared Owl (Se) *Asio flammeus*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	sSAW
Northern Saw-whet Owl *Aegolius acadicus*	s A	s A	s A	s A	s A	s A	s A	s A	s AW
Common Nighthawk* (Sc) *Chordeiles minor*	s A	s A	s A	s A	sSA	sSA *	s A	sSA	sSA
Whip-poor-will* (Sc) *Caprimulgus vociferus*	s A	s A	s A	s A	sSA	sSA *	sSA*	sSA	sSA*
Chuck-will's-widow *Caprimulgus carolinensis*							sS		
Chimney Swift* *Chaetura pelagica*	sSA	sSA	sSA	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Ruby-throated Hummingbird* *Archilochus colubris*	sSA *	sSA *	sSA	sSA *	sSA *	sSA	sSA *	sSA *	sSA *
Belted Kingfisher* *Megaceryle alcyon*	sSAW*	sSAW*	sSAW	sSAW*	sSAW*		sSAW*	sSAW*	sSAW*
Red-headed Woodpecker* (Sc) *Melanerpes erythrocephalus*	s A	s A	s A	s A	s A	s A	s A	sSA *	sSAW
Red-bellied Woodpecker* *Centurus carolinus*	sSAW*	sSAW*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Yellow-bellied Sapsucker *Sphyrapicus varius*	s A	s A	s A	s A	s A	s A	s A	s A	s AW
Downy Woodpecker* *Picoides pubescens*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Hairy Woodpecker* *Picoides villosus*	sSAW	sSAW*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Northern Flicker* *Colaptes auratus*	sSAW*	sSAW*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Pileated Woodpecker *Dryocopus pileatus*							A	A	
Olive-sided Flycatcher *Nuttallornis borealis*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Eastern Wood Pewee* *Contopus virens*	sSA	sSA *	sSA	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Yellow-bellied Flycatcher *Empidonax flaviventris*		A		A			A	A	A
Alder Flycatcher* *Empidonax alnorum*	ssA	ssA	s A	s A	s A	s A	sSA *	s A	sSA *
Least Flycatcher *Empidonax minimus*	s A	s A	s A	s A	s A	s A	s A	s A	sSA *
Acadian Flycatcher* *Empidonax virescens*	s A	s A		sSA	s A	s A	s A	s A	ssA *
Eastern Phoebe* *Sayornis phoebe*	sSA *	ssA *	s A	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Great Crested Flycatcher* *Myiarchus crinitus*	sSA *	sSA *	s A	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Eastern Kingbird* *Tyrannus tyrannus*	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Horned Lark* (Sc) *Eremophila alpestris*	sAW*	sSAW*	s AW	sSAW*	s AW	sSAW*	s AW	s AW	s AW
Purple Martin* *Progne subis*	s A	s A	s A	s A	s A	s A	sSA*	s A	sSA*
Tree Swallow* *Iridoprocne bicolor*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSAW*
Northern Rough-winged Swallow* *Stelgidopteryx ruficollis*	s A	s A	s A	sSA*	sSA*	s A	sSA*	sSA*	sSA*
Bank Swallow* *Riparia riparia*	s A	s A	s A	sSA*	sSA*	s A	s A	sSA*	s A
Barn Swallow* *Hirundo rustica*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Cliff Swallow *Petrochelidon pyrrhonota*									A
Blue Jay* *Cyanocitta cristata*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
American Crow* *Corvus brachyrhynchos*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Fish Crow* *Corvus ossifragus*	sSAW	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Black-capped Chickadee* *Parus atricapillus*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Tufted Titmouse* *arus bicolor*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Red-breasted Nuthatch *Sitta canadensis*	W	s AW	W	s AW	s AW	s AW	s AW	s AW	s AW
White-breasted Nuthatch* *Sitta carolinensis*	sSAW*	sSAW*	sSAW*	s SAW*	sS AW*	sS AW*	s SAW*	sSAW*	sSAW*
Brown Creeper* *Certhia familiaris*	s AW*	s AW*	sAW*	s AW*	s AW*	s AW*	s AW*	s AW	sSAW*
Carolina Wren* *Thryothorus ludovicianus*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
House Wren* *Troglodytes aedon*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Winter Wren *Troglodytes troglodytes*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Sedge Wren (St) *Cistothorus platensis*									s A
Marsh Wren* *Cistothorus palustris*	s A	sSA*	sSA*	sSA*	sSA*	s A	sSA*	sSAW*	sSAW*
Golden-crowned Kinglet *Regulus satrapa*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Ruby-crowned Kinglet *Regulus calendula*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Blue-gray Gnatcatcher* *Polioptila caerulea*	s A	sSA*	s A	sSA*	sSA*	s A	sSA*	sSA*	sSA*
Eastern Bluebird* *Sialia sialis*	s A	sSAW	s A	sSAW	s A	s A	s AW	s A	sSAW*
Veery* *Cathaurs fuscescens*	s A	sSA	s A	sSA*	s A	s A	sSA*	sSA*	sSA*
Gray-cheeked Thrush *Catharus minimus*	s A	s A	s A	s A	s A	s A	s A	s A	s A

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Swainson's Thrush *Catharus ustulatus*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Hermit Thrush* *Catharus guttatus*	s AW	sSA*	s AW	sSAW*	s AW	s AW	sSAW*	sSAW*	sSAW*
Wood Thrush* *Hylocichla mustelina*	s A	sSA*	s A	sSA*	s A	sSA*	sSA*	sSA*	sSA*
American Robin* *Turdus migratorius*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Northern Wheatear *Oenanthe oenanthe*							A		
Gray Catbird* *Dumetella carolinensis*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Northern Mockingbird* *Mimus polyglottos*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Brown Thrasher* *Toxostoma rufum*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*	sSAW*
American Pipit *Anthus spinoletta*	s A		s A	s A	s A		s A		s A
Cedar Waxwing* *Bombycilla cedrorum*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Northern Shrike *Lanius excubitor*				s AW	s AW		s AW		s AW
Loggerhead Shrike (Se) *Lanius ludovicianus*									s A
European Starling* *Sturnus vulgaris*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
White-eyed Vireo* *Vireo griseus*		s A	s A	sSA*	s A	s A	sSA*	sSA*	sSA*
Solitary Vireo *Vireo solitarius*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Yellow-throated Vireo* *Vireo flavifrons*		s A		s A	s A	s A	s A	sSA*	sSA*
Warbling Vireo* *Vireo gilvus*		sSA*		sSA*	s A	s A	s A	sSA*	sSA*
Philadelphia Vireo *Vireo philadelphicus*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Red-eyed Vireo* *Vireo olivaceus*	s A	sSA*	s A	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*
Blue-winged Warbler* *Vermivora pinus*	sSA*	sSA*	s A	sSA*	sSA*	sSA*	sSA*	sSA*	sSA*

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Golden-winged Warbler (Sc) *Vermivora chrysoptera*		s A		s A		s A	s A	s A	s A
Tennessee Warbler *Vermivora peregrina*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Orange-crowned Warbler *Vermivora celata*	s A	s A	s A	s A	s A	s A	s A	s A	s AW
Nashville Warbler *Vermivora ruficapilla*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Northern Parula Warbler* *Parula americana*	s A	s A	s A	s A	s A	s A	sSA	sSA *	sSA
Yellow Warbler *Dendroica petechia*	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Chesnut-sided Warbler *Dendroica pensylvanica*	s A	s A	s A	s A	s A	s A	s A	sSA *	sSA
Magnolia Warbler *Dendroica magnolia*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Cape May Warbler *Dendroica tigrina*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Black-throated Blue Warbler* *Dendroica caerulescens*	s A	s A	s A	s A	s A	s A	s A	sSA *	s A
Yellow-rumped Warbler*Dendroica coronata*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Black-throated Green Warbler *Dendroica virens*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Blackburnian Warbler *Dendroica fusca*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Pine Warbler* *Dendroica pinus*	s A	s A	s A	s A	s A	sSA *	sSA *	s A	sSA *
Prairie Warbler* *Dendroica discolor*	sSA *	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
Palm Warbler *Dendroica palmarum*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Bay-breasted Warbler *Dendroica castanea*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Blackpoll Warbler *Dendroica striata*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Black-and-White Warbler* *Mniotilta varia*	s A	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
American Redstart* *Setophaga ruticilla*	s A	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Prothonotary Warbler *Protonotaria citrea*				s A			s A		s A
Worm-eating Warbler *Helmitheros vermivorus*								s A	
Ovenbird* *Seiurus aurocapillus*	s A	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
Northern Waterthrush *Seiurus noveboracensis*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Louisiana Waterthrush *Seiurus motacilla*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Kentucky Warbler *Oporornis formosus*								s A	s A
Connecticut Warbler *Oporornis agilis*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Mourning Warbler *Oporornis philadelphia*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Common Yellowthroat* *Geothlypis trichas*	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *	sSA *
Hooded Warbler *Wilsonia citrina*								s A	s A
Cerulean Warbler (Sc) *Dendroica cerulea*				s A				s A	s A
Wilson's Warbler *Wilsonia pusilla*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Canada Warbler *Wilsonia canadensis*	s A	s A	s A	s A	s A	s A	s A	sSA *	s A
Yellow-breasted Chat (Sc) *Icteria virens*	s A	s A	s A	s A	s A	s A	sSA *	sSA *	s A
Summer Tanager *Piranga rubra*									s A
Scarlet Tanager* *Piranga olivacea*	s A	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
Northern Cardinal* *Cardinalis cardinalis*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Rose-breasted Grosbeak* *Pheucticus ludovicianus*	s A	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
Indigo Bunting* *Passerina cyanea*	sSA *	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
Dickcissel *Spiza americana*		A							A

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Rufous-sided Towhee* *Pipilo erythrophthalmus*	sSA *	sSA *	sSA *	sSAW*	sSA *	sSA *	sSA *	sSA *	sSAW*
American Tree Sparrow *Spizella arborea*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Chipping Sparrow* *Spizella passerina*	sSA *	sSA *	s A	sSA *	sSA *	sSA *	sSA *	sSA *	sSAW*
Field Sparrow* *Spizella pusilla*	sSA *	sSA *	s A	sSA *	s A	sSA *	sSA *	sSA *	sSA *
Savannah Sparrow* *Passerculus sandwichensis*	sSAW*	sSAW*	s AW	s AW	s AW	sSAW*	sSAW*	s AW	sSAW*
Grasshopper Sparrow (Sc) *Ammodramus savannarum*		s A				s A			s A
Sharp-tailed Sparrow* *Ammospiza caudacuta*	s A	sSAW*	sSAW*	sSAW*	sSAW*	s A	sSAW*	sSAW*	sSAW*
Seaside Sparrow* (Sc) *Ammospiza maritima*	s A	sSAW*	sSAW*	sSAW*	sSAW*	s A	sSAW*	sSAW*	sSAW*
Vesper Sparrow (Sc) *Pooecetes gramineus*	s A	s AW		s A		s AW	s AW	s A	s AW
Fox Sparrow *Passerella iliaca*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Song Sparrow* *Milospiza melodia*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Lincoln's Sparrow *Melospiza lincolnii*		s A					s A		s A
Swamp Sparrow* *Melospiza georgiana*	s A	sSAW*	s A	sSAW*	s A	s A	sSAW*	s A	sSAW*
Lark Sparrow *Chondestes grammacus*									A
White-throated Sparrow *Zonotrichia albicollis*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s W
White-crowned Sparrow *Zonotrichia leucophrys*	s W	s W	s W	s W	s W	s W	s W	s W	s W
Dark-eyed Junco *Junco hyemalis*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Snow Bunting *Plectrophenax nivalis*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Bobolink *Dolichonyx oryzivorus*		A				A	A		A
Red-winged Blackbird* *Agelaius phoeniceus*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Eastern Meadowlark* **Sturnella magna**	sSAW*	sSAW*	s AW	s AW	s AW	sSAW*	sSAW*	s AW	sSAW*

Bird Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
s=Spring (Mar–May) S=Summer (Jun–Aug) A=Autumn (Sep–Nov) W=Winter (Dec–Feb) *=Birds documented breeding at the Complex									
Rusty Blackbird *Euphagus carolinus*	s A	s A	s A	s A	s A	s A	s A	s A	s A
Brewer's Blackbird *Euphagus cyanocephalus*									A
Common Grackle* *Quiscalus quiscula*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Boat-tailed Grackle *Quiscalus major*									S
Brown-headed Cowbird* *Molothrus ater*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Orchard Oriole* *Icterus spurius*								sSA *	A
Northern Oriole *Icterus galbula*	sSA *	sSA *	s A	sSA *	sSA *	sSA *	sSA *	sSA *	sSAW*
Purple Finch *Carpodacus purpureus*	s AW	s AW		s AW	s AW	s AW	s AW	s AW	s AW
House Finch *Carpodacus mexicanus*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Red Crossbill *Loxia curvirostra*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
White-winged Crossbill *Loxia leucoptera*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Common Redpoll *Carduelis flammea*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Hoary Redpoll *Carduelis hornemanni*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Pine Grosbeak *Pinicola enucleator*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
Pine Siskin *Carduelis pinus*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
American Goldfinch *Carduelis tristis*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*
Evening Grosbeak *Hesperiphona vespertina*	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW	s AW
House Sparrow *Passer domesticus*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*	sSAW*

Mammal Species of the Complex

Mammal Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
P=present H=Habitat									
Opossum *Didelphis marsupialis*	P	P	P	P	P	P	P	P	P
Masked Shrew *Sorex cinereus*	P	P	H	P	H	H	H	H	P
Short-tailed Shrew *Blarina brevicauda*	P	P	P	P	P	P	P	P	P
Eastern Mole *Scalopus aquaticus*	P	P	H	P	H	P	P	P	P
Star-nosed Mole *Condylura cristata*			H				H		
Little Brown Myotis *Myotis lucifugus*	P	P	P	P	P	P	P	P	P
Keen's Myotis *Myotis keenii*									H
Silver-haired Bat *Lasionycteris noctivagans*							P		P
Eastern Pipistrelle *Pipistrellus subflavus*	P	P	P	P	P	P	P	P	P
Big Brown Bat *Eptesicus fuscus*	P	P	P	P	P	P	P	P	P
Red Bat *Lasiurus borealis*							P	P	P
Hoary Bat *Lasiurus cinereus*									P
Eastern Cottontail *Sylvilagus floridanus*	P	P	P	P	P	P	P	P	P
New England Cottontail (Sc) *Sylvilagus transitionalis*									H
Woodchuck *Marmota monax*								P	P
Eastern Chipmunk *Tamias striatus*	P	P	P	P	P	P	P	P	P
Gray Squirrel *Sciurus carolinensis*	P	P	P	P	P	P	P	P	P
Southern Flying Squirrel *Glaucomys volans*	P	P		P	P	P	P	P	P
White-footed Mouse *Peromyscus leucopus*	P	P	P	P	P	P	P	P	P
Meadow Mouse *Microtus pennsylvanicus*	P	P	P	P	P	P	P	P	P

Mammal Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
P=present H=Habitat									
Pine Mouse *Pitymys pennsylvanicus*									P
Muskrat *Ondatra zibethicus*	P	P	P	P	P		P	P	P
House Mouse *Mus musculus*	P	P	P	P	P	P	P	P	P
Norway Rat *Rattus norvegicus*	P	P	P	P	P	P	P	P	P
Black Rat *Rattus rattus*									H
Meadow Jumping Mouse *Zapus hudsonius*	P	P		P				P	P
Harbor Porpoise (Sc) *Phocoena phocoena*					P				
Common Dolphin *Delphinus delphis*									
Bottle-nosed Dolphin *Tursiops truncatus*								P	
Red Fox *Vulpes vulpes*	P	P		P	P	P	P	P	P
Gray Fox *Urocyon cinereoargenteus*									H
Raccoon *Procyon lotor*	P	P	P	P	P	P	P	P	P
Long-tailed Weasel *Mustela frenata*	P	P		P		P	P		P
Mink *Mustela vison*		P		P					P
Striped Skunk *Mephitis mephitis*									P
River Otter *Lutra canadensis*					P				P
Harbor Seal *Phoca vitulina*				P	P			P	P
Harp Seal *Pagophilus groenlandicus*									
Gray Seal *Halichoerus grypus*					P				
Hooded Seal *Cystophora cristata*									
White-tailed Deer *Odocoileus virginianus*	P	P		P			P		P

Reptile and Amphian Species of the Complex

Reptile and Amphibian Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
P=present ?=unconfirmed									
Eastern Snapping Turtle *Chelydra serpentina*	P	P		P	P		P	P	P
Eastern Musk Turtle *Sternotherus odoratus*					P				P
Eastern Mud Turtle (Se) *Kinosternon subrubrum*				?					P
Red-eared Slider *Chrysemys scripta*									P
False Map Turtle *Graptemys pseudogeographica*									P
Eastern Painted Turtle *Chrysemys picta*		P		P	P		P	P	P
Eastern Diamondback Terrapin *Malaclemys terrapin*		P	P	P	P		P	P	P
Wood Turtle (Sc) *Clemmys insculpta*									?
Spotted Turtle (Sc) *Clemmys guttata*							P		P
Eastern Box Turtle (Sc) *Terrapene carolina*	P	P		P	P	P	P	P	P
Chinese Box Turtle *Cistoclemmys flavomarginata*									P
Green Sea Turtle (Ft, St) *Chelonia mydas*	?	?	?	?	?	?	?	?	?
Kemp's Ridley (Fe, Se) *Lepidochelys kempi*				P	P				
Loggerhead (Ft, St) *Caretta caretta*				P	P			P	P
Leatherback (Fe, Se) *Dermochelys coriacea*					P				
Hawksbill (Fe, Se) *Eretmochelys imbricata*					P				
Worm Snake (Sc) *Carphophis amoenus*	?	?		?	?	?	?	?	P
Black Racer *Coluber constrictor*	P	P		P	?	P	P	P	P
Northern Ringneck Snake *Diadophis punctatus*							P		P
Black Rat Snake *Elaphe obsoleta*									?

Reptile and Amphibian Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
P=present ?=unconfirmed									
Eastern Hognose Snake (Sc) *Heterodon platyrhinos*	P	?		?		?	?	?	P
Eastern Milk Snake *Lampropeltis triangulum*	P	P		P		P	P	P	P
Northern Water Snake *Nerodia sipedon*		?		P	?		P	?	P
Rough Green Snake *Opheodrys aestivus*	?	?		?	?	?	P	?	P
Smooth Green Snake *Opheodrys vernalis*	?	?		?	?	?	?	?	?
Brown Snake *Storeria dekayi*	P	P	P	P	?	P	P	P	P
Red-bellied Snake *Storeria occipitomaculata*	?	?		?		?	?	?	?
Eastern Ribbon Snake *Thamnophis sauritus*	P	P		P	P	P	P	P	P
Common Garter Snake *Thamnophis sirtalis*	P	P	P	P	P	P	P	P	P
Eastern Newt *Notophthalmus viridescens*	?	?		P	?	?	?	?	P
Spotted Salamander *Ambystoma maculatum*		?		?		?	?	?	P
Marbled Salamander (Sc) *Ambystoma opacum*		?		?			?		?
Tiger Salamander (Se) *Ambystoma tigrinum*									?
Dusky Salamander *Desmognathus fuscus*							?	?	?
Two-lined Salamander *Eurycea bislineata*							?	?	?
Four-toed Salamander *Hemidactylium scutatum*									?
Red-backed Salamander *Plethodon cinereus*	?	P		P	?	P	P	P	P
Eastern Spadefoot Toad (Sc) *Scaphiopus holbrooki*	P	?		?	?	?	?	?	P
Bullfrog *Rana catesbeiana*	?	P		P	P	?			
Green Frog *Rana clamitans*	P	P		P	P	?	P	?	P

Reptile and Amphibian Species	Amagansett	Conscience Point	Lido Beach	Morton	Oyster Bay	Sayville	Seatuck	Target Rock	Wertheim
P=present ?=unconfirmed									
Pickerel Frog *Rana palustris*		?		?	?	?	P	?	P
Wood Frog *Rana sylvatica*	P	P		P	?	?	P	?	P
American Toad *Bufo americanus*							?		?
Fowler's Toad *Bufo woodhousei*	P	P	P	P	P	P	P	P	P
Northern Cricket Frog (Se) *Acris crepitans*									?
Gray Treefrog *Hyla versicolor*	?	P		P	?	P	P	?	P
Spring Peeper *Hyla crucifer*	P	P	?	P	P	P	P	P	P
Chorus Frog *Pseudacris triseriata*									?
Southern Leopard Frog (Sc) *Rana sphenocephala*	?	?		P	?	?	P	?	P

Fish Species of the Complex

FAMILY	COMMON NAME	LATIN NAME
Angullidae	American Eel	*Anguilla rostrata*
Ammodytidae	American Sand Lance	*Ammodytes hexapterus*
Aphrdoderidae	Pirate Perch	*Aphredoderus sayanus*
Atherninidae	Atlantic Silversides	*Menidia menidia*
	Tidewater Silversides	*Menidia beryllinia*
Balistidae	Orange Filefish	*Aluterus schoepfi*
	Planehead Filefish	*Monacanthus hispidus*
Batrachoididae	Oyster Toadfish	*Ospanus tau*
Belonidae	Atlantic Needlefish	*Strongylura marina*
	Agojon	*Tylosurus acus*
Blenniidae	Striped Blenny	*Chasmodei bosquianus*
Bothidae	Summer Flounder	*Paralichthys dentatus*
	Smallmouth Flounder	*Etropus microstomus*
	Fourspot Flounder	*Paralichthys oblongus*
	Windowpane	*Septhtalmus aquosus*
Carangidae	Crevalle Jack	*Caranx hippo*
	Permit	*Trachinotus falcatus*
	Blue Runner	*Caranx crysos*
	Lookdown	*Selene vomer*
Carcharhinidae	Sandbar Shark	*Carcharhinus plumbeus*
	Smooth Dogfish	*Mustelus canis*
Centrarchidae	Largemouth Bass	*Micropterus salmoides*
	Black Crappie	*Pomoxis nigromaculatus*
	Pumpkinseed	*Lepomis gibbosus*
	Bluegill	*Lepomis macrochirus*
Chaetodontidae	Foureye Butterflyfish	*Chaetodon capistratus*
Cottidae	Sea Raven	*Hemitripterus americanus*
	Shorthorn sculpin	*Myoxocephalus scorpius*
	Grubby	*Myoxocephalus aenaeus*

FAMILY	COMMON NAME	LATIN NAME
Clupeidae	Atlantic Herring	*Clupea harengus*
	Hickory Shad	*Alosa mediocris*
	Blueback Herring	*Alosa aestivalis*
	Alewife	*Alosa pseuddoharengus*
	Menhaden	*Brevoorrtia tyrannus*
Congridae	Conger Eel	*Conger oceanicus*
Cyprinidae	Carp	*Cyprinus carpio*
	Golden shiner	*Notemigonus crysolevcas*
Cyprinodontidae	Marsh Killifish	*Fundulus heteroclitus*
	Banded Killifish	*Fundulus diaphanus*
	Striped Killifish	*Fundulus majalis*
	Sheepshead Minnow	*Cyprinodon variegatus*
	Rainwater Killifish	*Lucania parva*
Dasyatidae	Roughtail Stingray	*Dasyatis centroura*
	Cownose Ray	*Rhinoptera bonasus*
Diodontidae	Striped Burrfish	*Chilomycterus schoepfi*
Engraulidae	Bay Anchovy	*Anchoa mitchilli*
Esocidae	Chain Pickerel	*Esox miger*
	Redfin Pickerel	*Esox americanus*
Exocoetidae	Ballyhoo	*Hemiamphus brasiliensis*
	Halfbeak	*Hyporhamphus unifasciatus*
	Atlantic Flying Fish	*Cypselurus melenurus*
Gadidae	Tomcod	*Microgadus tomcod*
	Pollock	*Pollachius virens*
Phycidae	Red Hake	*Urophycis chuss*
	Silver Hake	*Merluccius bilineraris*
	Atlantic Cod	*Gadus morhua*
	Spotted Hake	*Urophycis regia*
	White Hake	*Urophycis tenuis*

FAMILY	COMMON NAME	LATIN NAME
Gasterosteidae	Black Spotted Stickleback	*Gasterosteus wheatlandi*
	Nine Spine Stickleback	*Pungitius pungitius*
	Three Spine Stickleback	*Gasterosteus acuteatus*
	Four Spine Stickleback	*Apeltes quadracus*
Gobiidae	Seaboard Goby	*Gobiosoma ginsbugi*
	Naked Goby	*Gobiosoma bosci*
Ictaluridae	Brown Bullhead	*Ameriurus nebulosus*
Labridae	Tautog	*Tautoga onitis*
	Cunner	*Tautogolabrus adspersus*
Lutjanidae	Gray Snapper	*Lutjanus griseus*
Mugilidae	Striped Mullet	*Mugil cephalus*
	White Mullet	*Mugil curema*
Ostraciidae	Smooth Trunkfish	*Lactophrys triqueter*
	Honeycomb Cowfish	*Lactophrys polygonia*
	Scrawled Cowfish	*Lactophrys quadricornis*
Percichthyidae	White Perch	*Morone americana*
	Striped Bass	*Morone saxatilis*
Percidae	Yellow Perch	*Perca flavecens*
	Tesselated Darter	*Etheostomas olmstedi*
Pholidae	Rock Gunnel	*Pholis gunnellus*
Pleuronectidae	Winter Flounder	*Pseudopleuronectes americanus*
Poeciliidae	Mosquitofish	*Gambusia affinis*
Pomatomidae	Bluefish	*Pomatomus saltix*
Rajidae	Little Skate	*Raja erinacea*
	Clearnose Skate	*Raja eglanteria*
	Barndoor Skate	*Raja laevis*
	Winter Skate	*Raja ocellata*

FAMILY	COMMON NAME	LATIN NAME
Salmonidae	Brook Trout	*Salvelinus fontinalis*
	Brown Trout	*Salmo trutta*
	Rainbow Trout	*Oncorhynchus pygmaea*
Sciaenidae	Spot	*Lieostomus xanthrus*
	Weakfish	*Cynoscion regalis*
Scianenidae	Silver Perch	*Bairdialla chryoura*
	Northern Kingfish	*Menticirrus saxatilis*
Scombridae	Atlantic Mackerel	*Scomber scombrus*
	Chub Mackerel	*Scomber japonicus*
Serrandidae	Black Sea Bass	*Centropristis striata*
Sparidae	Scup	*Stenotomus chrysops*
	Pinfish	*Lagodon rhomboides*
Sphyraenidae	Northern Sennet	*Sphyraena borealis*
Squalidae	Spiny Dogfish	*Squalus acanthias*
Stromateidae	Butterfish	*Peprilus triacanthus*
Suleidae	Hogchoker	*Trinectes maculatus*
Syngnathidae	Lined Seahorse	*Hippocampus erectus*
	Northern Pipefish	*Syngnathus fuscus*
Synodotidae	Inshore Lizardfish	*Synodus foetens*
Tetraodontidae	Northern Puffer	*Sphoeroides maculatus*
Torpedinidae	Atlantic Torpedo	*Torpedo nobiliana*
Triglidae	Striped Searobin	*Prionotus evolans*
	Northern Searobin	*Prionotus carolinas*
Umbridae	Eastern Mudminnow	*Umbra pygmaea*

Butterfly Species of the Complex

SPECIES	PRESENCE ON THE COMPLEX
SWALLOWTAILS Family: Papilionidae	
Pipevine Swallowtail *Battus philenor*	?
Zebra Swallowtail *Eurytides marcellus*	?
Black Swallowtail *Papilio polyxenes*	Yes
Eastern Tiger Swallowtail *Papilio glaucus*	Yes
Spicebush Swallowtail *Papilio Troilus*	Yes
WHITES AND SULFURS Family: Pieridae	
Cabbage White *Pieris rapae*	Yes
Falcate Orangetip *Anthocharis midea*	Yes
Clouded Sulphur *Colias philodice*	Yes
Cloudless Sulphur *Phoebis sennae*	Yes
GOSSAMER WINGS Family: Lycaenidae	
Harvester *Feniseca tarquinius*	Yes
COPPERS	
American Copper *Lycaena phlaeas*	Yes
Bronze Copper *Lycaena hyllus*	Yes
***SATYRIUM* HAIRSTREAKS**	
Coral Hairstreak *Satyrium titus*	Yes
Edwards Hairstreak *Satyrium edwardsii*	Yes
Banded Hairstreak *Satyrium calanus*	Yes
Striped Hairstreak *Satyrium liparops*	Yes
Southern Hairstreak *Satyrium favonius*	Yes

SPECIES	PRESENCE ON THE COMPLEX
SWALLOWTAILS Family: Papilionidae	
"Olive" Juniper Hairstreak *Callophrys gryneus*	Yes
Hessel's Hairstreak (Se) *Callophrys hesseli*	?
Brown Elfin *Callophrys augustinus*	?
Frosted Elfin (St) *Callophrys irus*	?
Henry's Elfin (Sc) *Callophrys henrici*	?
Eastern Pine Elfin *Callophrys niphon*	?
Gray Hairstreak *Strymon melinus*	?
BLUES	
Eastern Tailed Blue *Everes comyntas*	Yes
Spring Azure *Celastrina ladon*	Yes
SNOUT BUTTERFLIES Family: Libytheidae	
BRUSH–FOOTED BUTTERFLIES Family: Nymphalidae	
Great Spangled Fritillary *Speyeria cybele*	Yes
Question Mark *Polygonia interrogationis*	?
Eastern Comma *Polygonia comma*	?
Mourning Cloak *Nymphalis antiopa*	Yes
American Lady *Vanessa virginiensis*	Yes
Red Admiral *Vanessa atalanta*	Yes
Red-Spotted Purple *Limenitis arthemis astyanax*	Yes
Viceroy *Limenitis archippus*	Yes

SPECIES	PRESENCE ON THE COMPLEX
BROWNS Subfamily Satyrinae	
Appalachian Brown *Satyrodes appalachia*	?
Little Wood Satyr *Megisto cymela*	?
Common Wood Nymph *Cercyonis pegala*	?
MILKWEED BUTTERFLIES Subfamily Danainae	
Monarch *Danaus plexippus*	Yes
THE SKIPPERS Superfamily Hesperioidea	
SPREAD-WINGED SKIPPERS Pyrginae	
Silver-Spotted Skipper *Epargyreus clarus*	Yes
Southern Cloudywing *Thorybes bathyllus*	?
Northern Cloudywing *Thorybes pylades*	?
DUSKYWINGS	
Sleepy Duskywing *Eryniss brizo*	Yes
Juvenal's Duskywing *Eryniss juvenalis*	Yes
Wild Indigo Duskywing *Eryniss baptisiae*	?
Common Sootywing *Pholisora catullus*	Yes
FOLDED WING SKIPPERS Hesperiidae	
Least Skipper *Ancyloxypha numitor*	?
European Skipper *Thymelicus lineola*	?
Leornard's Skipper *Hesperia leonardus*	?
Cobweb Skipper *Hesperia metea*	?
Peck's Skipper *Polites peckius*	?

SPECIES	PRESENCE ON THE COMPLEX
Tawny-edged Skipper *Polites themistocles*	?
Crossline Skipper *Polites origenes*	?
Long Dash *Polites mystic*	?
Southern Broken Dash *Wallengrenia otho*	?
Little Glassywing *Pompeius verna*	?
Sachem *Atalopedes campestris*	?
Delaware Skipper *Atrytone logan*	?
Hobomok Skipper *Poanes hobomok*	Yes
Broad-winged Skipper *Poanes viator zizaniae*	Yes
Two-spotted Skipper *Euphyes bimacula*	?
Dun Skipper *Euphyes vestris*	?
Dusted Skipper *Atrytonopsis hianna*	Yes
Salt Marsh Skipper *Panoquina panoquin*	Yes

Threatened or Endangered Species

Birds			
Common Loon (Sc) *Gavia immer*	**Northern Goshawk (Sc)** *Accipiter gentilis*	**Common Tern* (St)** *Sterna hirundo*	**Sedge Wren (St)** *Cistothorus platensis*
Pied-billed Grebe* (St) *Podilymbus podiceps*	**Red-shouldered Hawk* (Sc)** *Buteo lineatus*	**Least Tern* (St)** *Sterna albifrons*	**Loggerhead Shrike (Se)** *Lanius ludovicianus*
American Bittern* (Sc) *Botaurus lentiginosus*	**Golden Eagle (Se)** *Aquila chrysaetos*	**Black Tern (Se)** *Chlidonias nigra*	**Golden-winged Warbler (Sc)** *Vermivora chrysoptera*
Least Bittern* (St) *Ixobrychus exilis*	**Peregrine Falcon (Se)** *Falco peregrinus*	**Black Skimmer (Sc)** *Rynchops niger*	**Cerulean Warbler (Sc)** *Dendroica cerulea*
Osprey* (Sc) *Pandion haliaetus*	**Black Rail (Se)** *Laterallus jamaicensis*	**Short-eared Owl (Se)** *Asio flammeus*	**Yellow-breasted Chat (Sc)** *Icteria virens*
Bald Eagle (Ft, St) *Haliaeetus leucocephalus*	**King Rail (St)** *Rallus elegans*	**Common Nighthawk* (Sc)** *Chordeiles minor*	**Grasshopper Sparrow (Sc)** *Ammodramus savannarum*
Northern Harrier* (St) *Circus cyaneus*	**Piping Plover* (Ft, Se)** *Charadrius melodus*	**Whip-poor-will* (Sc)** *Caprimulgus vociferus*	**Seaside Sparrow* (Sc)** *Ammospiza maritima*
Sharp-shinned Hawk (Sc) *Accipiter striatus*	**Upland Sandpiper (St)** *Bartramia longicauda*	**Red-headed Woodpecker* (Sc)** *Melanerpes erythrocephalus*	**Vesper Sparrow (Sc)** *Pooecetes gramineus*
Cooper's Hawk* (Sc) *Accipiter cooperii*	**Roseate Tern (Fe, Se)** *Sterna dougallii*	**Horned Lark* (Sc)** *Eremophila alpestris*	
Mammals, Reptiles, Amphibians, Butterflies			
New England Cottontail (Sc) *Sylvilagus transitionalis*	**Kemp's Ridley (Fe, Se)** *Lepidochelys kempi*	**Eastern Hognose Snake (Sc)** *Heterodon platyrhinos*	**Hessel's Hairstreak (Se)** *Callophrys hesseli*
Harbor Porpoise (Sc) *Phocoena phocoena*	**Loggerhead Sea Turtle (Ft, St)** *Caretta caretta*	**Marbled Salamander (Sc)** *Ambystoma opacum*	**Frosted Elfin (St)** *Callophrys irus*
Eastern Mud Turtle (Se) *Kinosternon subrubrum*	**Leatherback Sea Turtle (Fe, Se)** *Dermochelys coriacea*	**Tiger Salamander (Se)** *Ambystoma tigrinum*	**Henry's Elfin (Sc)** *Callophrys henrici*
Wood Turtle (Sc) *Clemmys insculpta*	**Green Sea Turtle (Ft, St)** *Chelonia mydas*	**Eastern Spadefoot Toad (Sc)** *Scaphiopus holbrooki*	
Spotted Turtle (Sc) *Clemmys guttata*	**Hawksbill Sea Turtle (Fe, Se)** *Eretmochelys imbricata*	**Northern Cricket Frog (Se)** *Acris crepitans*	
Eastern Box Turtle (Sc) *Terrapene carolina*	**Worm Snake (Sc)** *Carphophis amoenus*	**Southern Leopard Frog (Sc)** *Rana sphenocephala*	

Fe=Federally endangered Ft=Federally threatened Se=State endangered
St=State threatened Sc=State species of special concern

Plants			
Sandplain Gerardia (Fe, Se) *Agalinis acuta*	**Small-Flowered Pearlwort (Se)** *Sagina decumbens*	**Flax-Leaf White-Top (St)** *Aster solidagineus*	**Swamp Sunflower (St)** *Helianthus angustifolius*
Little-Leaf Tick Trefoil (St) *Desmodium ciliare*	**Seabeach Knotweed (Se)** *Polygonum glaucum*	**Stiff Tick-Trefoil (Se)** *Desmodium obtusum*	**Water Pigmy Weed (Se)** *Crassula aquatica*
Round-Leaf Boneset (Se) *Eupatorium rotundifolium var ovatum*	**Swamp Cottonwood (St)** *Populus heterophylla*	**Northern Blazing Star (St)** *Liatris borealis*	**Silver Aster (Se)** *Aster concolor*
Coast Flatsedge (Se) *Cyperus polystachyos var texensis*	**Rough Rush Grass (Se)** *Sporobolus clandestinus*	**Sandplain Wild Flax (St)** *Linum intercursum*	**Showy Aster (St)** *Aster spectabilis*
Bushy Rockrose (St) *Helianthemum dumosum*	**Marsh Straw Sedge (St)** *Carex hormathodes*	**Southern Yellow Flax (St)** *Linum medum var texanum*	
Velvety Lespedeza (St) *Lespedeza stuevei*	**Stargrass (St)** *Aletris farinosa*	**Few-Flowered Nutrush (Se)** *Scleria pauciflora var caroliniana*	
Opelousa Smartweed (St) *Polygonum hydropiperoides var opelousanum*	**Slender Pinweed (St)** *Lechea tenuifolia*	**Spring Ladies-Tresses (Se)** *Spiranthes vernalis*	

Fe=Federally endangered Ft=Federally threatened Se=State endangered St=State threatened Sc=State species of special concern

Appendix B

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Bald eagles are a federal- and state-threatened species. They principally use the refuges while migrating or wintering, and are associated with aquatic or wetland habitats and their adjacent terrestrial borders.

Federal Laws and Mandates

Americans With Disabilities Act 1992	This Act prohibits discrimination in public accommodations and services of individuals based on disability.
Clean Air Act	The primary objective of the Clean Air Act is to establish Federal standards for various pollutants from both stationary and mobile sources and to provide for the regulation of polluting emissions via state implementation plans. In addition, the amendments are designed to prevent significant deterioration in certain areas where air quality exceeds national standards, and to provide for improved air quality in areas which do not meet Federal standards ("nonattainment" areas). Federal facilities are required to comply with air quality standards to the same extent as nongovernmental entities. Part C of the 1977 amendments stipulates requirements to prevent significant deterioration of air quality and, in particular, to preserve air quality in national parks, national wilderness areas, national monuments and national seashores. The amendments establish Class I, II and III areas, where emissions of particulate matter and sulfur dioxide are to be restricted. The restrictions are most severe in Class I areas and are progressively more lenient in Class II and III areas. Mandatory Class I Federal lands include all national wilderness areas exceeding 500 acres. Such lands may not be redesignated. Additionally, national wildlife refuges which exceed 10,000 acres may only be redesignated by States as Class I or Class II areas. Federal land managers are charged with direct responsibility to protect the air quality and related values (including visibility) of Class I lands and to consider, in consultation with EPA, whether proposed industrial facilities will have an adverse impact on these values. Federal land managers are also required to determine whether existing industrial sources of air pollution must be retrofitted to reduce impacts on Class I areas to acceptable levels.
Clean Water Act 1977	This Act requires consultation with the Corps of Engineers (404 permits) for major wetland modifications.
Emergency Wetland Resources Act of 1986	This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act also requires the Secretary to establish a National Wetlands Priority Conservation Plan, requires the States to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amount equal to import duties on arms and ammunition.

Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended.	Public Law 93-205, approved December 28, 1973, repealed the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275). The 1969 act had amended the Endangered Species Preservation Act of October 15, 1966 (P.L. 89-669, 80 Stat. 926). The 1973 Endangered Species Act provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, both through Federal action and by encouraging the establishment of State programs. The Act: • Authorizes the determination and listing of species as endangered and threatened; • Prohibits unauthorized taking, possession, sale, and transport of endangered species; • Provides authority to acquire land for the conservation of listed species, using land and water conservation funds; • Authorizes establishment of cooperative agreements and grants-in-aid to States that establish and maintain active and adequate programs for endangered and threatened wildlife and plants; • Authorizes the assessment of civil and criminal penalties for violating the Act or regulations; and • Authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act of any regulation issued thereunder.
Environmental Education Act of 1990 (20 U.S.C. 5501-5510; 104 Stat. 3325)	Public Law 101-619, signed November 16, 1990, established the Office of Environmental Education within the Environmental Protection Agency to develop and administer a Federal environmental education program. Responsibilities of the Office include developing and supporting programs to improve understanding of the natural and developed environment, and the relationships between humans and their environment; supporting the dissemination of educational materials; developing and supporting training programs and environmental education seminars; managing a Federal grant program; and administering an environmental internship and fellowship program. The Office is required to develop and support environmental programs in consultation with other Federal natural resource management agencies, including the Fish and Wildlife Service.
Executive Order 11988, Floodplain Management	The purpose of this Executive Order, signed May 24, 1977, is to prevent Federal agencies from contributing to the adverse impacts associated with occupancy and modification of floodplains. In the course of fulfilling their respective authorities, Federal agencies shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.
Executive Order 12898, Environmental Justice	The purpose of this Executive Order, signed on February 11, 1994, requires Federal agencies to consider the effects of projects and policies on minority and lower income populations.

Executive Order 13112: Invasive Species	The purpose of this Executive Order, signed on February 3, 1999, is to prevent the introduction of invasive species and provide for their control, as well as to minimize the economic, ecological, and human health impacts that invasive species cause. Under this Executive Order Federal agencies whose actions may affect the status of invasive species shall: (1) identify such actions, (2) use relevant programs and authorities to prevent, control, monitor, and research such species, and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere. Federal agencies shall pursue these duties in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan.
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	The purpose of this Executive Order, signed January 10, 2001 instructs Federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners in Flight Bird Conservation Plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.
Federal Advisory Committee Act	The purpose of this Act is to authorize the establishment of a system governing the creation and operation of advisory committees in the executive branch of the Federal Government and for other purposes. Meetings held exclusively between federal officials and elected members of state, local and tribal governments, or their designated employees, where the purpose of the meetings is to exchange views, information or advice on the management or implementation of federal programs with intergovernmental responsibilities, are excluded.
Fish and Wildlife Act of 1956	The Fish and Wildlife Act of 1956 establishes a comprehensive national fish, shellfish, and wildlife resources policy with emphasis on the commercial fishing industry but also with a direction to administer the Act with regard to the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment and to maintain and increase public opportunities for recreational use of fish and wildlife resources. The 1998 amendments to the Act modified the powers of the Secretary of Interior in regard to volunteer service, community partnerships and education programs.
Fish and Wildlife Conservation Act of 1980 (16 USC 661-667e), as amended.	This Act requires the Service to monitor non-gamebird species, identify species of management concern, and implement conservation measures to preclude the need for listing under ESA.
Fish and Wildlife Improvement Act of 1978	This act was passed to improve the administration of fish and wildlife programs and amends several earlier laws, including the Refuge Recreation Act, the National Wildlife Refuge Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out volunteer programs.

Freedom of Information Act	This Act requires all Federal agencies to make available to the public for inspection and copying administrative staff manuals and staff instructions, official, published and unpublished policy statements, final orders deciding case adjudication, and other documents. It also requires the party seeking the information to pay reasonable search and duplication costs.
Historic Preservation Acts	There are various laws for the preservation of historic sites and objects.
Antiquities Act (16 U.S.C. 431 - 433)	The Act of June 8, 1906, (34 Stat. 225) authorizes the President to designate as National Monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States. The Act required that a permit be obtained for examination of ruins, excavation of archaeological sites and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.
Archaeological Resources Protection Act (16 U.S.C. 470aa - 470ll)	Public Law 96-95, approved October 31, 1979, (93 Stat. 721) largely supplanted the resource protection provisions of the Antiquities Act for archaeological items. This Act established detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from Federal or Indian lands. It also established civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from Federal or Indian land in violation of any provision of Federal law; and for interstate and foreign commerce in such resources acquired, transported or received in violation of any State or local law.
Public Law 100-588	Approved November 3, 1988, (102 Stat. 2983) lowered the threshold value of artifacts triggering the felony provisions of the Act from $5,000 to $500, made attempting to commit an action prohibited by the Act a violation, and required the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the Nation.
Archeological and Historic Preservation Act (16 U.S.C. 469-469c)	Public Law 86-523, approved June 27, 1960, (74 Stat. 220) as amended by Public Law 93-291, approved May 24, 1974, (88 Stat. 174) to carry out the policy established by the Historic Sites Act (see below), directed Federal agencies to notify the Secretary of the Interior whenever they find a Federal or Federally assisted, licensed or permitted project may cause loss or destruction of significant scientific, prehistoric or archaeologic data. The Act authorized use of appropriated, donated and/or transferred funds for the recovery, protection and preservation of such data.
Historic Sites, Buildings and Antiquities Act (16 U.S.C. 461-462, 464-467)	The Act of August 21, 1935, (49 Stat. 666) popularly known as the Historic Sites Act, as amended by Public Law 89-249, approved October 9, 1965, (79 Stat. 971) declared it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provided procedures for designation, acquisition, administration and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this Act. As of January, 1989, 31 national wildlife refuges contained such sites.

National Historic Preservation Act of 1966 (16 U.S.C. 470-470b, 470c-470n)	Public Law 89-665, approved October 15, 1966, (80 Stat. 915) and repeatedly amended, provided for preservation of significant historical features (buildings, objects and sites) through a grant-in-aid program to the States. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468-468d). The Act established an Advisory Council on Historic Preservation, which was made a permanent independent agency in Public Law 94-422, approved September 28, 1976 (90 Stat. 1319). That Act also created the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register. As of January, 1989, 91 historic sites on national wildlife refuges have been placed on the National Register.
Land and Water Conservation Fund Act of 1948	This act provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources of for land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies, including the Fish and Wildlife Service.
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d, 715e,715f-715r)	This Act established the Migratory Bird Conservation Commission which consists of the Secretaries of the Interior (chairman), Agriculture, and Transportation, two members from the House of Representatives, and an ex-officio member from the state in which a project is located. The Commission approves acquisition of land and water, or interests therein, and sets the priorities for acquisition of lands by the Secretary for sanctuaries or for other management purposes. Under this Act, to acquire lands, or interests therein, the state concerned must consent to such acquisition by legislation. Such legislation has been enacted by most states.
Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718-718j, 48 Stat. 452), as amended	The "Duck Stamp Act," as this March 16, 1934, authority is commonly called, requires each waterfowl hunter 16 years of age or older to possess a valid Federal hunting stamp. Receipts from the sale of the stamp are deposited in a special Treasury account known as the Migratory Bird Conservation Fund and are not subject to appropriations.
Migratory Bird Treaty Act 1918	This Act designates the protection of migratory birds as a Federal responsibility, and enables the setting of seasons, and other regulations including the closing of areas, Federal or non-Federal, to the hunting of migratory birds.
National and Community Service Act of 1990 (42 U.S.C. 12401; 104 Stat. 3127)	Public Law 101-610, signed November 16, 1990, authorizes several programs to engage citizens of the U.S. in full- and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Several provisions are of particular interest to the U.S. Fish and Wildlife Service.

National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, 83 Stat. 852) as amended by P.L. 94-52, July 3, 1975, 89 Stat. 258, and P.L. 94-83, August 9, 1975, 89 Stat. 424).	Title I of the 1969 National Environmental Policy Act (NEPA) requires that all Federal agencies prepare detailed environmental impact statements for "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." The 1969 statute stipulated the factors to be considered in environmental impact statements, and required that Federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unquantified environmental values are given appropriate consideration, along with economic and technical considerations. Title II of this statute requires annual reports on environmental quality from the President to the Congress, and established a Council on Environmental Quality in the Executive Office of the President with specific duties and functions.
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended.	This Act defines the National Wildlife Refuge System as including wildlife refuges, areas for protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. The Secretary is authorized to permit any use of an area provided such use is compatible with the major purposes for which such area was established. The purchase consideration for rights-of-way go into the Migratory Bird Conservation Fund for the acquisition of lands. By regulation, up to 40% of an area acquired for a migratory bird sanctuary may be opened to migratory bird hunting unless the Secretary finds that the taking of any species of migratory game birds in more than 40% of such area would be beneficial to the species. The Act requires an Act of Congress for the divestiture of lands in the system, except (1) lands acquired with Migratory Bird Conservation Commission funds, and (2) lands can be removed from the system by land exchange, or if brought into the system by a cooperative agreement, then pursuant to the terms of the agreement.

National Wildlife Refuge System Improvement Act of 1997	Public Law 105-57, amends the National Wildlife System Act of 1966 (16 U.S.C. 668dd-ee), providing guidance for management and public use of the Refuge System. The Act mandates that the Refuge System be consistently directed and managed as a national system of lands and waters devoted to wildlife conservation and management. The Act establishes priorities for recreational uses of the Refuge System. Six wildlife-dependent uses are specifically named in the Act: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. These activities are to be promoted on the Refuge System, while all non-wildlife dependant uses are subject to compatibility determinations. A compatible use is one which, in the sound professional judgment of the Refuge Manger, will not materially interfere with or detract from fulfillment of the Refuge System Mission or refuge purpose(s). As stated in the Act, *"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."* The Act also requires development of a comprehensive conservation plan for each refuge and management of each refuge consistent with the plan. When writing CCP, planning for expanded or new refuges, and when making management decisions, the Act requires effective coordination with other Federal agencies, state fish and wildlife or conservation agencies, and refuge neighbors. A refuge must also provide opportunities for public involvement when making a compatibility determination or developing a CCP.
New York State Wild Scenic and Recreational Rivers Act (Article 15 Title 27, Environmental Conservation Law Implementing Regulations–6NYCRR PART 666)	The state's Wild Scenic and Recreational Rivers Act protects those rivers of the state that possess outstanding scenic, ecological, recreational, historic, and scientific values. These attributes may include value derived from fish and wildlife and botanical resources, aesthetic quality, archaeological significance and other cultural and historic features. State policy is to preserve designated rivers in a free flowing condition, protecting them from improvident development and use. This policy is intended to preserve the enjoyment and benefits derived from these rivers for present and future generations. DEC's regulations implementing the Wild Scenic and Recreational Rivers Act affect management, protection, enhancement, and control, of land use and development on all designated river areas in New York State.

North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401-4412)	Public Law 101-233, enacted December 13, 1989, provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, U.S. and Mexico. The Act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the Act, along with an authorization for annual appropriation of $15 million plus an amount equal to the fines and forfeitures collected under the Migratory Bird Treaty Act. Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States share of the cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on Federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year.
Refuge Recreation Act of 1962	This Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Northern Cardinal

Refuge Revenue Sharing Act (16 U.S.C. 715s)	Section 401 of the Act of June 15, 1935, (49 Stat. 383) provided for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges. Public Law 88-523, approved August 30, 1964, (78 Stat. 701) made major revisions by requiring that all revenues received from refuge products, such as animals, timber and minerals, or from leases or other privileges, be deposited in a special Treasury account and net receipts distributed to counties for public schools and roads. Public Law 93-509, approved December 3, 1974, (88 Stat. 1603) required that moneys remaining in the fund after payments be transferred to the Migratory Bird Conservation Fund for land acquisition under provisions of the Migratory Bird Conservation Act. Public Law 95-469, approved October 17, 1978, (92 Stat. 1319) expanded the revenue sharing system to include National Fish Hatcheries and Service research stations. It also included in the Refuge Revenue Sharing Fund receipts from the sale of salmonid carcasses. Payments to counties were established as: 1) on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent of the net receipts produced from the land; and 2) on land withdrawn from the public domain, 25 percent of net receipts and basic payments under Public Law 94-565 (31 U.S.C. 1601-1607, 90 Stat. 2662), payment in lieu of taxes on public lands. This amendment also authorized appropriations to make up any difference between the amount in the Fund and the amount scheduled for payment in any year. The stipulation that payments be used for schools and roads was removed, but counties were required to pass payments along to other units of local government within the county which suffer losses in revenues due to the establishment of Service areas.
Rehabilitation Act of 1973 (29 U.S.C. 794) as amended.	Title 5 of P.L. 93-112 (87 Stat. 355), signed October 1, 1973, prohibits discrimination on the basis of handicap under any program or activity receiving Federal financial assistance.
Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948	This Act provides that upon determination by the Administrator of the General Services Administration, real property no longer needed by a Federal agency can be transferred, without reimbursement, to the Secretary of the Interior if the land has particular value for migratory birds, or to a State agency for other wildlife conservation purposes.
Volunteer and Partnership Enhancement Act of 1998	This Act, signed October 5, 1998, amended the Fish and Wildlife Act of 1956 to promote volunteer programs and community partnerships for the benefit of national wildlife refuges, and for other purposes.

Wilderness Act of 1964 Public Law 88-577, approved September 3, 1964, directed the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems for inclusion in the National Wilderness Preservation System.

Suffolk County Vector Control

Open marsh water management areas

Appendix C

Compatibility Determinations

- Wildlife Observation and Photography, Environmental Education and Interpretation C-1
- White-Tailed Deer Hunting C-15
- Waterfowl Hunting (Resident Canada Geese) C-23
- Sport Fishing C-29
- Non-Motorized Boating (Oyster Bay) C-35
- Non-Motorized Boating (Wertheim) C-39
- Fish Stocking C-43
- Research by Non-Service Personnel C-47
- Beach Use/Sunbathing C-53
- Mosquito Management C-57

Compatibility Determination

Use
Wildlife Observation and Photography, Environmental Education and Interpretation

Refuge Name
Long Island National Wildlife Refuge Complex

Dates Established

Wertheim National Wildlife Refuge	1947
Elizabeth A. Morton National Wildlife Refuge	1954
Conscience Point National Wildlife Refuge	1964
Target Rock National Wildlife Refuge	1967
Amagansett National Wildlife Refuge	1968
Oyster Bay National Wildlife Refuge	1968
Seatuck National Wildlife Refuge	1968
Lido Beach Wildlife Management Area	1969

Establishing and Acquisition Authorities
In 1947, Cecile and Maurice Wertheim donated land they had maintained as a private waterfowl hunting reserve to the U.S. Fish and Wildlife Service (Service, we, our). We established the Wertheim refuge under these authorities: the Migratory Bird Conservation Act (16 U.S.C. §715d) and the Refuge Recreation Act (16 U.S.C. §460k-1). Between 1954 and 1968, we also established these refuges under the authority of the Migratory Bird Conservation Act: the Conscience Point, Elizabeth A. Morton, Oyster Bay, Seatuck, and Target Rock refuges. We acquired the property for the Amagansett refuge in 1968 by the "Transfer of certain real property for wildlife conservation purposes; reservation of rights" (16 U.S.C §667b). Under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. §661), we established the Lido Beach Wildlife Management Area in the Town of Hempstead in December 1969.

Refuge Purposes

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).
- "…their particular value in carrying out the national migratory bird management program" (16 U.S.C §667b).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? Yes. The uses are "wildlife observation and photography and environmental education and interpretation," four of the six priority uses of the National Wildlife Refuge System (16 U.S.C. 668dd–668ee, as amended by Pub. L. 105–57; 111 Stat. 1252). Pedestrian travel to help facilitate these priority public uses on the Long Island National Wildlife Refuge

Complex (Complex) can include walking, cross country skiing, and snowshoeing which are not priority public uses.

(b) Where would the use be conducted? Wildlife observation and photography and environmental education and interpretation will be limited to established nature trails and beaches on these refuges: Amagansett, Morton, Oyster Bay, Target Rock, and Wertheim.

Amagansett refuge, in the Town of Easthampton, NY, consists of 36 acres of barrier beach habitat, including a double dune system, swales, and sandy beach (figure C-1). The refuge boundary extends to the mean high waterline of the Atlantic Ocean. In the summer of 2005, a pair of piping plovers (Charadrius melodus) nested on the beachfront for the first time in several years, and successfully fledged two young. We erected signs and symbolic fencing around the nesting area, to comply with our piping plover recovery plan (USFWS 1996). The State of New York lists piping plovers as endangered. The Federal Government lists as threatened the Atlantic Coast population of piping plovers. At Amagansett refuge, access for these priority uses would be restricted to the beachfront.

The 187 acre Morton refuge in the Town of Southampton, NY, encompasses a variety of habitats. Its beaches extend to the mean high waterline of the Noyack and Little Peconic bays. We would permit wildlife observation and photography along the 1.2 mile Wild Birds Nature Trail (figure C-2) year-round and along the 1.5 mile peninsula between the bays.

Sandy and rocky beaches fringe that peninsula, and provide nesting habitat for ospreys, piping plovers, and least terns between April 1 and August 31 each year. In 2005, six pairs of piping plover nested at the refuge, but due to predation and inclement weather, they fledged only four young. In the last decade, piping plovers have nested at the Morton refuge each year. The least tern colony at the refuge in 2005 succeeded in producing 28 fledglings, down from the 60 young fledged in 2003. Due to the federal and state listing status of these migratory shorebirds, walking in the nesting areas would be restricted.

The Target Rock refuge, located in Huntington, NY, includes 80 acres of mature oak-hickory forest, tidal wetlands and rocky beach habitats. The beach at Target Rock provides important foraging habitat for piping plovers. As many as two pairs of piping plovers have nested on the sandy beach next to refuge property, most recently in 2000. Historically, portions of that beach have been closed to reduce the disturbance of belted kingfishers and bank swallows nesting on the adjacent cliffs. We would allow foot access for these priority uses along the 1 mile Warbler's Loop Trail, the 0.75 mile Rocky Beach Trail, and the 0.5 mile Gardener's Path (figure C-3). We would prohibit walking near nesting areas.

Wertheim refuge, located in Shirley, NY, serves as the headquarters for the Long Island National Wildlife Refuge Complex. Wertheim is the largest refuge in the Complex, and encompasses 2,550 acres of forests, grasslands and wetlands. We would permit these priority uses along the White Oak Nature Trail (the 1.5 mile short loop and the 3.0 mile long loop) and on the 1 mile loop Indian Landing Tail (figure C-4). Our long-term plan for accommodating these priority uses includes constructing a visitor center on the east side of the Carmans River and adding trails, observation blinds, and an open-air education pavilion.

(c) When would the use be conducted? All open refuge units operate each day from half an hour before sunrise to half an hour after sunset (i.e., daylight hours only), unless otherwise specified.

We would open the Amagansett refuge beachfront to wildlife observation, photography, environmental education, and interpretation during the non-nesting season, from September 1 through March 31. From April 1 to August 31, we may close parts of the beachfront to public entry. We will erect symbolic fencing and post those areas with "Nesting Area Closed" signs. That closure will help ensure high-quality, undisturbed nesting habitat for piping plovers and other beach nesting migratory birds of management

concern (e.g., least terns). We will prohibit walking on and over the dunes, to protect the fragile dune ecosystem.

At the Morton refuge, we would open the Wild Birds Nature Trail to the beach, including the loop. The 1.5 mile beachfront peninsula would be available for use during the non-nesting season, from September 1 through March 31, during trail hours. From April 1 to August 31, we will close the beachfront to all public entry. That closure will help ensure high-quality, undisturbed nesting habitat for piping plovers and other beach nesting migratory birds of management concern (e.g., least terns).

At Target Rock refuge, the Warbler's Loop and Gardener's Path would be open year-round to walking for these priority uses during daylight hours only, from half an hour before sunrise to half an hour after sunset. The Rocky Beach Trail would be open for walking during the non-nesting season, from September 1 through March 31, during trail hours. From April 1 to August 31, we will close a quarter-mile of the trail (beachfront) to all public entry. That closure will help ensure high-quality, undisturbed nesting habitat for piping plovers and other beach nesting migratory birds of management concern (e.g., least terns, belted kingfishers, and bank swallows). At the Wertheim refuge, the White Oak and Indian Landing Trails would be open year-round to pedestrians for these four priority uses from 8:00 a.m. to 4:00 p.m., except during hunting seasons.

(d) How would the use be conducted? We would conduct these four priority uses much as we conduct them today. We allow them only on designated nature trails and beachfront areas. The dunes and vegetated areas on the Complex, including the salt marsh, are closed to public entry throughout the year. Walking on the dunes can harm stabilizing vegetation and result in the erosion and loss of important wildlife habitat. "Closed Area" signs mark areas closed to public entry.

Visitors who want to walk the trails typically enter the refuges by their entrance roads or by boats. We charge a minimal entrance fee for all persons entering the Morton or Target Rock refuges. We estimate the annual visitation for each refuge at 85,550 visitors for Wertheim, 73,400 for Target Rock, 105,500 for Morton, and 36,000 for Amagansett. We attribute 77 percent of that total to visitors who engage in these four priority uses.

We do not limit the numbers of pedestrians at each refuge. Our recent observations and discussions with refuge visitors indicate their number at any one time does not typically exceed 100 per refuge. We require organized groups of more than 10 to obtain a Special Use Permit (SUP) before entering the refuge. To gain better estimates of refuge visitation, beginning in 2007, refuge staff would record the numbers of pedestrians seen during patrols, the types of access, user interactions, and potential safety concerns. We would install safety and information signs as necessary. We will conduct these four priority uses on the Complex and ensure their compatibility in accordance with the stipulations below.

(e) Why is this use being proposed? Wildlife observation and photography and environmental education and interpretation are four of the six priority public uses of the National Wildlife Refuge System. If compatible, they are to receive enhanced consideration over other general public uses.

These four priority uses will provide compatible educational and recreational opportunities for visitors to enjoy refuge resources and improve their understanding and appreciation of fish and wildlife, wild lands ecology, wildlife management, and the relationships of plant and animal populations in the ecosystem. Refuge visitors will better understand the problems facing our wildlife and wild lands resources, realize what effect the public has on wildlife resources, and learn more about the Service role in conservation. They will better understand the biological facts underlying our management programs, and appreciate why wildlife and wild lands are important. Likewise, these four priority uses will provide opportunities for visitors to observe wildlife habitats firsthand and learn about wildlife and wild lands at their own pace in

an unstructured environment. Our authorizing these uses will produce more informed public advocacy of Service programs.

Foot travel is a fundamental method for the public to access the Complex. It is a historic and relatively unobtrusive means to view plants and wildlife in representative natural landscapes and to reach fishing sites. Walking, cross-country skiing, and snowshoeing are activities that can help facilitate these priority public uses. For example, cross-country skis and snowshoes allow visitors to access existing trails at Wertheim, Morton, and Target Rock during the winter months when there is snow on the ground, and offer a means to engage in wildlife observation and other priority wildlife-dependent public uses in areas inaccessible by foot.

Professional and amateur photographers will gain opportunities to photograph wildlife in their natural habitats. Those opportunities obviously will result in increased publicity and advocacy for Service programs. They will provide wholesome, safe, outdoor recreation in a scenic setting, enticing those who come solely for recreation to participate in the educational aspects of our public use program and become advocates for the Refuge System and the Service.

Availability of Resources

The continuation of access accommodating public use at the current level, no more than 100 visitors at any one time on each refuge, would not require a significant increase in maintenance or visitor services staff expenditures (outdoor recreation planner or law enforcement). Staff time associated with administration of this use is related to maintaining kiosks, gates, sign-posting, providing information to the public about the use, conducting visitor surveys, analyzing visitor use patterns, and monitoring the effects of the use on refuge resources. A lead Outdoor Recreation Planner would administer the program. A Wildlife Biologist assisted by seasonal interns would monitor the environmental effects of public access. A Park Ranger would conduct law enforcement activities to provide for visitor safety and resource protection.

Maintenance of trails and facilities are costs related to accommodating these uses. The major portion of the funds needed to support the four priority uses is in the form of salaries to maintain the trails and to provide protection and monitoring; additional funds are needed for maintenance materials and other supplies. At Wertheim, Morton and Target Rock, there are bathrooms which are maintained and open year-round for public users of the trail system. Additionally, there are kiosks at Wertheim, Morton and Target Rock which provide important information to help guide the users to locations of interest. The kiosks receive regular maintenance and brochure replenishment. It is estimated that approximately one day per week is spent at each location conducting routine maintenance, trail clearing, and general upkeep.

The CCP prescribes additional visitor facilities and activities. The estimated cost of constructing and maintaining these structures is detailed below. However, the development of many of the CCP's strategies is dependent upon receiving adequate funding and staffing. The Complex will continue to manage these activities at current levels until this funding is made available.

New Construction	Estimated Costs
Complex visitor facility at Wertheim NWR	$5,700,000
New interpretive trails at Wertheim NWR	$150,000
New outdoor classroom at Wertheim NWR	$150,000
Signage for new facilities (interpretive, directional and regulatory)	$200,000
Interpretive kiosk at Amagansett NWR	$40,000
Total	**$6,240,000**

Annual, recurring costs include the equipment, materials and supplies associated with maintaining the Complex's current and future visitor facilities. In addition, informational and educational products that

are produced and disseminated on a routine basis are incorporated in the following cost analysis. The maintenance costs are partially offset by the collection of entrance fees at Elizabeth A. Morton and Target Rock NWRs, approximately $8,000 in fees are collected annually.

Annual (recurring costs)	Estimated Costs
Trail and facility maintenance for public users at Wertheim NWR	$18,000
Trail and facility maintenance for public users at Morton NWR	$9,000
Trail and facility maintenance for public users at Target Rock NWR	$9,000
Equipment and supplies (including brochures and trail guides)	$20,000
Total	**$56,000**

Existing staff will administer the visitor services program for the Complex. Additional staff may be required in the future as the program expands with a visitor facility.

Staffing	Annual Salary
Existing staff costs to administer the program	$225,000

*FY06 Complex Budget

Salaries	$763,620
Fixed Costs	$117,291
Annual Maintenance	$31,200
Total	**$912,111**

Anticipated Impacts of the Use

Wildlife observation, photography, environmental education, and interpretation can affect the wildlife resource positively or negatively. A positive effect of public involvement in these priority public uses will be a better appreciation and more complete understanding of the refuge wildlife and habitats. That can translate into more widespread, stronger support for the Complex, the Refuge System and the Service. Pedestrian travel (walking, cross country skiing, and snowshoeing) as conducted on Long Island NWR Complex has not been studied in a rigorous fashion. Pedestrian travel has the potential of impacting shorebird, waterfowl, marshbirds and other migratory bird populations feeding and resting near the trails and on beaches during certain times of the year. Use of upland trails is more likely to impact songbirds than other migratory birds. Human disturbance to migratory birds has been documented in many studies in different locations. Since skiing and snowshoeing are winter activities that require snow, there are fewer adverse impacts to the Complex's species of concern compared to activities like jogging, bicycling, and horseback riding.

Direct Impacts

Direct impacts have an immediate affect on wildlife. We expect those impacts to include the presence of humans disturbing wildlife, which typically results in a temporary displacement without long-term effects on individuals or populations. Some species will avoid the areas people frequent, such as the developed trails and the buildings, while others seem unaffected by or even drawn to the presence of humans. Overall, those effects should not be significant, because most of the refuge will experience minimal public use.

Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities includes: departure from site (Owen 1973, Burger 1981, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid

disturbance by feeding at night instead of during the day. The location of recreational activities impacts species in different ways. Miller et al. (1998) found that nesting success was lower near recreational trails, where human activity was common, than at greater distances from the trails. A number of species have shown greater reactions when pedestrian use occurred off trail (Miller, 1998). In addition, Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern U.S. In regard to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived, in the late fall, than later in winter. She also found gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1997) found that singing behavior of some species was altered by low levels of human intrusion. Pedestrian travel can impact normal behavioral activities, including feeding, reproductive, and social behavior. Studies have shown that ducks and shorebirds are sensitive to pedestrian activity (Burger 1981, 1986). Resident waterbirds tend to be less sensitive to human disturbance than migrants, and migrant ducks are particularly sensitive when they first arrive (Klein 1993). In areas where human activity is common, birds tolerated closer approaches than in areas receiving less activity.

Indirect Impacts
People can be vectors for invasive plants by moving seeds or other propagules from one area to another. Once established, invasive plants can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring and treatment when necessary. Our staff will work at eradicating invasive plants and educating the visiting public.

Cumulative Impacts
Impacts may be minor when we consider them alone, but may become important when we consider them collectively. Our principal concern is repeated disruptions of nesting, resting, or foraging birds.

Our knowledge and observations of the affected areas show no evidence that these four, priority, wildlife-dependent uses cumulatively will adversely affect the wildlife resource. Private landowners have allowed the public to engage in these wildlife-dependent uses for many years without discernible negative effects. However, opening refuge lands to public use can often result in littering, vandalism, or other illegal activities on the refuges. Although we do not expect substantial cumulative impact from these four priority uses in the near term, it will be important for refuge staff to monitor those uses and, if necessary, respond to conserve high-quality wildlife resources.

Refuge staff, in collaboration with volunteers, will monitor and evaluate the effects of these priority public uses to discern and respond to any unacceptable impacts on wildlife or habitats. To mitigate those impacts, the refuge will close areas where such birds as piping plovers, terns, colonial water birds or ospreys are nesting. We expect no additional effects from providing these four priority uses.

Public Review and Comment
We are publishing this compatibility determination for review concurrently with our draft comprehensive conservation plan (CCP) and its environmental assessment. We have discussed these uses at CCP public meetings, and our Planning Update identifies them. We have already received several comments. Another opportunity for public comment will run concurrently with the public review and comment period of the CCP.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- We will permit these four priority uses on the Morton and Target Rock refuges beachfronts only from September 1 through March 31.
- We will install signs for visitor information, safety, and resource protection.
- We will conduct an outreach program to promote public awareness and compliance with public use regulations.
- We will limit maximum group size to 10 persons to promote public safety, accommodate other users, and limit wildlife disturbance.
- We will conduct baseline inventories of the physical condition of the beachfront, dunes, and trail systems bi-annually to monitor how pedestrian use affects plant life. Use any changes in physical conditions to identify any management interventions required to protect refuge resources.
- We will conduct biological inventories to provide baseline information for measuring change. If monitoring and evaluation of the use indicate that compatibility criteria are being exceeded, take appropriate action to restore compatibility, including modifying or discontinuing the use.
- We will conduct routine law enforcement patrols throughout the year. The patrols will promote compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interaction. The patrols will record visitor numbers, visitor activities, and activity locations to document current and future levels of refuge use.

Justification

The National Wildlife Refuge System Improvement Act of 1997 (Pub. L. 105–57) identifies six legitimate and appropriate uses of wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Where these uses have been determined compatible, they are to receive enhanced consideration over other uses in planning and management.

We have determined four of the six priority uses to be compatible at their current levels and under the stipulations listed above. Walking, snowshoeing and cross-country skiing are only means of facilitating these priority public uses. Under those conditions, we do not expect them to materially interfere with or detract from the mission of the System or diminish the purposes for which the refuges were established; nor do we expect them to cause significant adverse effects on refuge resources or cause any undue administrative burden.

Project Leader_____ 8/24/06
(Signature) (Date)

Concurrence

Regional Chief_____ 8/31/2006
(Signature) (Date)

Mandatory 15 year Re-evaluation Date August 31, 2021
(Date)

Literature Cited

Belanger, L., and J. Bedard. 1990. Energetic cost of man-induced disturbance to staging snow geese. Journal of Wildlife Management. 54:36.

Boyle, S.A., F.B. Samson. 1985. Effects of nonconsumptive recreation on wildlife: A review. Wildlife Society Bulletin 13:110.

Burger, J. 1981. The effect of human activity on birds at a coastal bay. Biological Conservation. 21:231-241.

Burger, J. 1986. The effect of human activity on shorebirds in two coastal bays in northeastern United States. Environmental Conservation. 13:123-130.

Erwin, R.M. 1980. Breeding habitat by colonially nesting water birds in 2 mid-Atlantic U.S. regions under different regimes of human disturbance. Biological Conservation. 18:39-51.

Gutzwiller, K.J., R.T. Wiedenmann, K.L. Clements. 1997. Does human intrusion alter the seasonal timing of avian song during breeding periods? Auk. 114:55-65.

Havera, S.P., L.R. Boens, M.M. Georgi, and R. T. Shealy. 1992. Human disturbance of waterfowl on Keokuk Pool, Mississippi River. Wildlife Society Bulletin. 20:290-298.

Henson, P.T., and A. Grant. 1991. The effects of human disturbance on trumpeter swan breeding behavior. Wildlife Society Bulletin. 19:248-257.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin. 19:242-248.

Klein, M.L. 1993. Waterbird behavioral responses to human disturbances. Wildlife Society Bulletin. 21:31-39.

Korschen, C.E., L.S. George, and W.L. Green. 1985. Disturbance of diving ducks by boaters on Comprehensive Conservation Plan - 215 - Appendix G: Final Compatibility Determinations a migrational staging area. Wildlife Society Bulletin. 13:290-296.

McNeil, Raymond; Pierre Drapeau; John D. Goss-Custard. 1992. The occurrence and adaptive significance of nocturnal habitats in waterfowl. Biological Review. 67: 381-419.

Miller, S.G., R.L. Knight, and C.K. Miller. 1998. Influence of recreational trails on breeding bird communities. Ecological Applications. 8(1) 162-169.

Morton, J.M., A.C. Fowler, and R.L. Kirkpatrick. 1989. Time and energy budgets of American black ducks in winter. Journal of Wildlife Management. 53:401-410.

Owen, M. 1973. The management of grassland areas for wintering geese. Wildfowl. 24:123-130.

U.S. Fish and Wildlife Service. 1996. Piping plover (Charadrius melodus) Atlantic Coast population revised recovery plan. U. S. Fish and Wildlife Service, Hadley, Massachusetts. 245 pp.

Ward, D.H., and R.A. Stehn. 1989. Response of Brant and other geese to aircraft disturbance at Izembek Lagoon, Alaska. U.S. Fish and Wildlife Service, Alaska Fish and Wildlife Research Center. Final report to the Minerals Management Service. Anchorage, Alaska. 193 pp.

Williams, G.J., and E. Forbes. 1980. The habitat and dietary preferences of dark-bellied Brant geese and widgeon in relation to agricultural management. Wildfowl. 31:151-157.

U.S. Fish & Wildlife Service

Amagansett National Wildlife Refuge

Suffolk County, New York

1:3,650

Refuge Boundary* (36 Acres)

*The refuge border stops at the mean high tide line

Produced by Long Island NWR, Shirley, New York
Base Map: USGS 2001 Digital Orthophotography
Vegetation Data: USFWS 1994 NVCS mapping
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

0 0.1 0.2 Miles

0 0.1 0.2 0.3 Kilometers

N W E S

Figure C-1. Map of the Amagansett refuge

Pedestrian access is restricted to the beachfront. If piping plovers nest in that area, it may be subject to additional restrictions between April 1 and August 31. Ownership to the mean high watermark accurately describes the refuge boundary along the waterline.

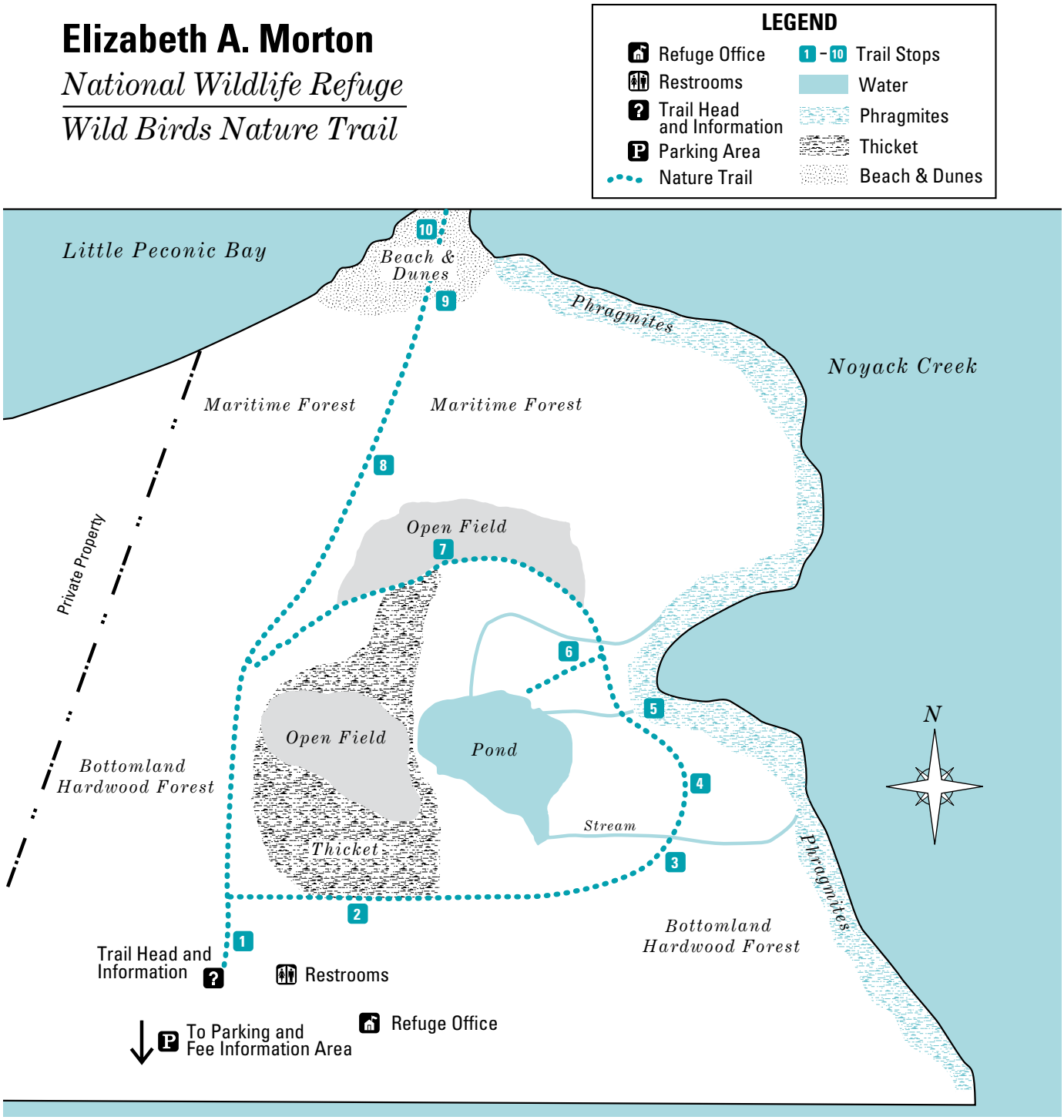


Figure C-2. Trail map for the Morton refuge
These trails would be open to pedestrian access year-round during daylight hours only. We would close the beachfront (beyond trail stop 10, not shown) each year from April 1 to August 31 to provide undisturbed nesting habitat for piping plovers and terns.

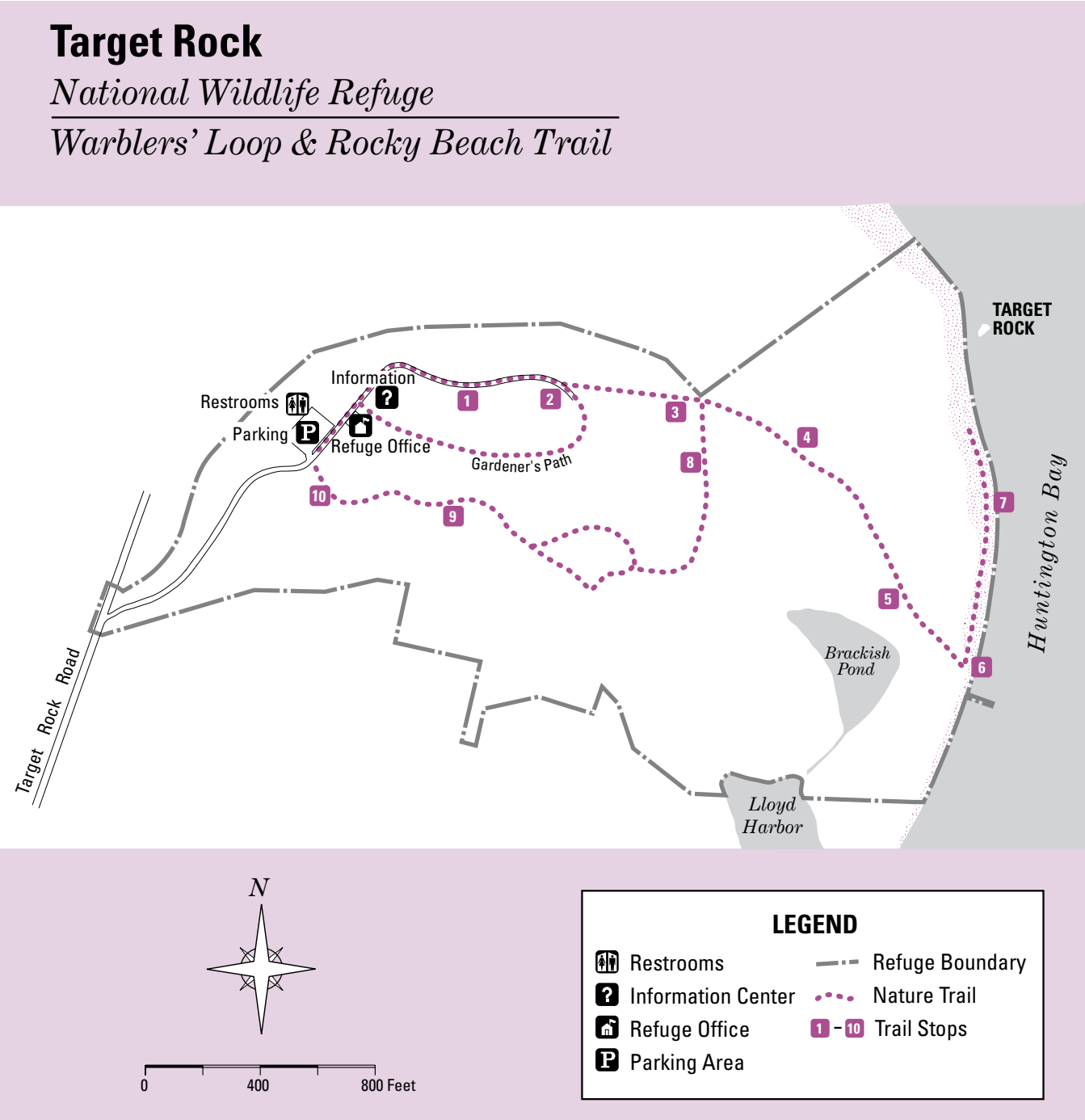


Figure C-3. Trail map for the Target Rock refuge
These trails would be open to pedestrian access year-round during daylight hours only. We would close a portion of the beachfront (Rocky Beach Trail) annually from April 1 to August 31 to provide undisturbed nesting and foraging habitat for migratory shorebirds.

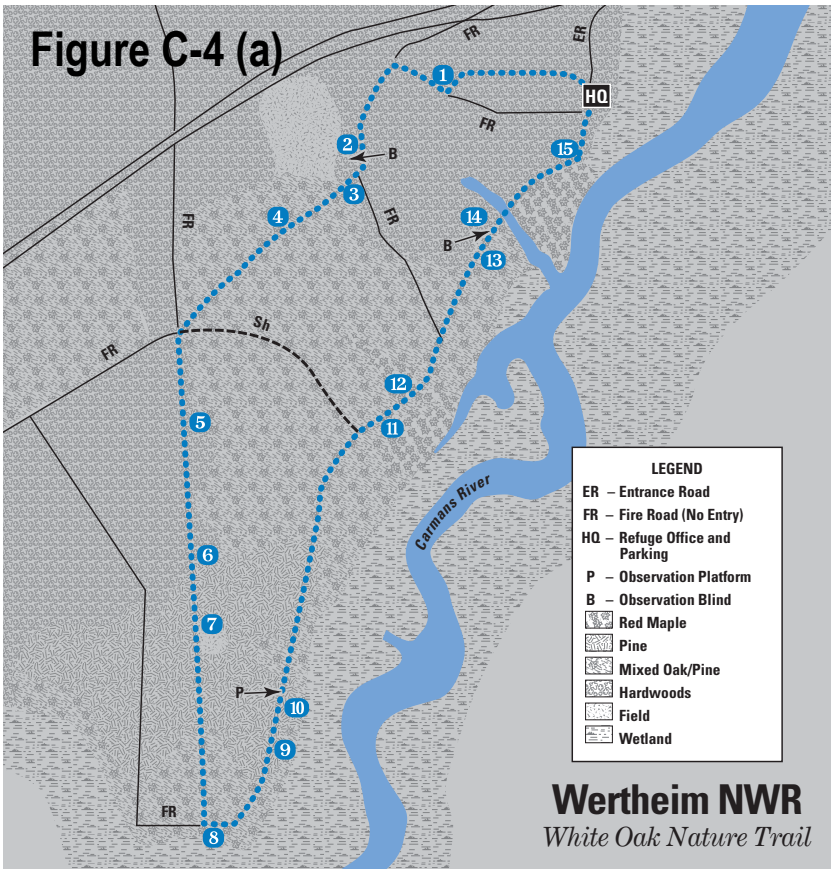
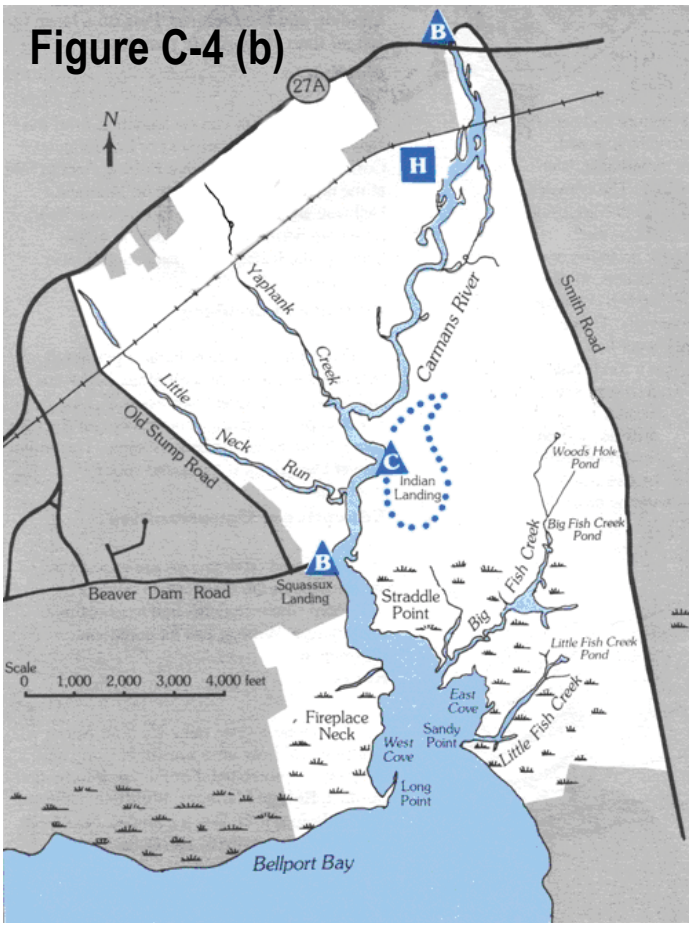


Figure C-4. Trail maps for the Wertheim refuge
The White Oak (**a**) and Indian Landing (**b**) trails would be open year-round to walking from 8:00 a.m. to 4:00 p.m., except in hunting seasons.



Compatibility Determination

Use
White-Tailed Deer Hunting

Refuge Name
Wertheim National Wildlife Refuge

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired Wertheim National Wildlife Refuge in 1947 by donation from Cecile and Maurice Wertheim, who had maintained the area as a private reserve for waterfowl hunting. We acquire land for the refuge under the authorities of the Migratory Bird Conservation Act (MBCA) (16 U.S.C. 715d) and the Refuge Recreation Act (16 U.S.C. 724f(a)(4)).

Refuge Purposes

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? The use is hunting white-tailed deer. Hunting is a priority public use of the National Wildlife Refuge System, under the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105–57; 111 Stat. 1282).

(b) Where would the use be conducted? We will conduct the deer hunt at the Wertheim refuge, the headquarters of the nine-unit Long Island National Wildlife Refuge Complex. We have divided that 2,550-acre refuge into six hunting zones based on its road network and watercourses. As we acquire more tracts nearby, we will evaluate them for inclusion in the deer-hunting program. We may close Zone 4 to hunting periodically throughout the season to allow other visitors to engage in other priority public uses on the White Oak Nature Trail. The annual refuge hunting permit will list those closures and regulations.

(c) When would the use be conducted? Hunting will take place within the seasonal framework established by the New York State Department of Environmental Conservation (NYSDEC): October – December, archery; January weekdays, firearms.

(d) How would the use be conducted? We would conduct the hunt in accordance with the refuge "White-Tailed Deer Hunt Plan," which includes the following.

Smith Road, Montauk Highway, and Old Stump Road, respectively, form much of the eastern, northern, and western boundaries of the refuge. Those roads adjoin suburban development. Additional residential development abuts the refuge at Golden Gate Drive to the southeast, Old Barto Road to the northwest,

and Beaver Dam Road, Meadow Lane and Burnett Lane to the southwest. To ensure public safety and adhere to New York State statute, we will visually delineate and enforce a 500-foot "no hunt" zone inside the refuge boundary.

We will honor all state and local laws applicable to hunting, including the following New York State law. No person shall

> *"…discharge a firearm or long bow within five hundred feet from a dwelling house, farm building or farm structure actually occupied or used, school building, school playground, or occupied factory or church"* (NYS ECL 11-0931-4(a)(2)).

We will permit hunting only for white-tailed deer on the refuge. The take will accord with state bag limits and seasons, although antlerless deer will be targeted, to reduce the overabundance of deer. Before the hunting season begins, we will determine that ratio of antlerless to antlered deer, based on refuge habitat management objectives and the annual deer survey. Portable tree stands are the only type permitted on the refuge, and hunters must remove them at the end of each day. Firearms hunters are required to wear a minimum of 400 square inches of blaze orange fabric visible from all sides.

Hunters with disabilities may arrange accommodations in Zone 4. Hunters recognized by NYSDEC as disabled will have preference regarding the use of those areas.

All persons interested in hunting on the refuge must possess a valid state hunting license and tag(s) before submitting their application and non-refundable fee. We will select hunters in a random drawing. Before hunting on the refuge, those selected must attend a scheduled refuge hunter orientation. We will assess each hunter a non-transferable, non-refundable, seasonal application fee to offset the hunt's administrative costs.

On arriving at the refuge for the hunt, hunters must check in with refuge personnel and display the following items: a state hunting license and tags, a Firearms Identification Card or License to Carry, a valid refuge permit, and the appropriate amount of hunter orange. Before leaving the refuge, hunters are required to check out at the designated refuge location.

As hunters sign in each day at the refuge office, we will provide them with a permit package of maps delineating hunt zones, current refuge regulations, hunt units, "no-hunt" zones, and other pertinent information. At all times while hunting on the refuge, hunters must have in their possession the permit issued by the refuge. That system will enable the refuge to control the quality and safety of the hunt. The signed hunting permit will comply with this "written permission" law.

> *"It shall be unlawful for any person to shoot, hunt, fish or trap upon the fenced, enclosed, or posted lands of another…without permission in writing from the owner, tenant or agent of such owner, and every person hunting, fishing, shooting or fowling upon such lands shall have in his possession such written permission when so doing"* (WV Code 20-2-7).

(e) Why is this use being proposed? We proposed hunting to reduce the overpopulation of the deer on the refuge and provide the public with opportunities for recreation identified as one of the six priority wildlife-dependent public uses of the Refuge System.

The refuge "Station Management Plan" (1992) contains a management objective with the dual strategies of (1) monitoring the size of the deer population and its effect on vegetation, and (2) reducing deer populations to levels consistent with habitat carrying capacity. Hunting has been a traditional form of recreation along the Carmans River corridor for generations. Before we acquired the refuge, the

Wertheim family hunted waterfowl, small game, and deer along the lower reaches of the river. Waterfowl hunting continues today north of the refuge in Southaven County Park and south of the refuge in Great South Bay. Service policy recognizes hunting as an acceptable, traditional form of recreation, particularly on lands that historically supported it. We may modify opportunities for hunting on refuge lands for various reasons, including such considerations as maintaining wildlife populations, habitat, safety, a high-quality hunting experience, or in rare instances, protecting a research population.

Habitats for wildlife have diminished considerably over the past few decades as urban and suburban development expanded into the wild lands remaining on Long Island. The protected lands remaining must support a wide variety of wildlife in a limited area. The competition among wildlife species for space and foraging habitat is intense, and white-tailed deer are a known source of damage to forest and grassland vegetation. When unchecked by predators or hunting pressures, white-tailed deer populations breed beyond the ability of the land to support them. Because they adapted well to suburban environments, their increasing abundance is especially problematic.

The availability of desirable forage and the absence of predators have allowed deer populations to thrive in such areas (Krausman et al. 1992). High-density herds (i.e., >30 deer /mi^2) have been associated with damage to habitats (e.g., lack of forest regeneration and loss of woody understories), economic impacts (e.g., timber resources, ornamental plantings, agricultural damage, and vehicle collisions), and tick-borne disease transmission (Woolf and Harder 1979, Cypher and Cypher 1988). The need for action at the Wertheim refuge is based principally on the negative impacts on vegetation by a high density of white-tailed deer (i.e., >30 deer /mi^2). Browse lines and reduced woody understories are evident on the refuge. Deer foraging habits and preferences are known to change plant composition and structure over time (Porter 1991a, Van Deelan et al. 1996, Brown and Parker 1997, Augustine 1998a, Russell and Fowler 1999). Such alterations have subsequent impacts on other wildlife, such as the richness and abundance of songbird species (De Calesta 1994). Several other studies (Casey and Hein 1983, McShea and Rappole 1992) have found reduced richness or abundance of songbird species in areas with high deer densities.

In 2001, refuge personnel evaluated forest regeneration at the refuge. The results of the initial investigation indicate a strong disparity between seedling production and sapling survivorship on the refuge. That is indicative of deer over browsing negatively impacting forest regeneration rates.

Estimated Growth in the Deer Population

Before 2000, deer population estimates were approximate. However, we believe that the deer population began to increase substantially in the late 1980s, as suburban development increased and we added additional parcels of land to the refuge. Those changes eliminated hunting in areas previously hunted, and provided more landscaping plants as food for deer.

Since 2000, the refuge staff has performed vehicle-based surveys to estimate deer density in November and December each year. Those surveys concentrated on roughly 64 percent, or 1,630 acres (2.5 mi^2), of the refuge that we considered deer habitat, and used scientific protocols and procedures that take into account a number of variables. We conducted the surveys along 8.5 miles of roads that traverse the preferred deer habitat, encompassing approximately 2.5 square miles.

Using that survey information, which included the numbers of deer sighted and their distance from the road, we were able to calculate estimated deer density. Although all survey techniques contain some form of bias, we were able to obtain a relative sense of deer population and density in the survey area ranging between 62 and 108 deer/mi^2 over the last 4 years. The Patuxent Research Refuge and Brookhaven National Laboratory (BNL), which conduct similar vehicle-based surveys, estimate that this survey technique has a bias because the survey fails to count approximately 25 percent of the actual deer density. (H. Obrecht, USFWS, personal comm., T. Green, BNL, personal comm.). When the refuge modifies the

actual vehicle-based survey results, we believe with scientific certainty that the deer density exceeds 100 deer/mi^2.

To validate our vehicle-based surveys, the refuge conducted an aerial survey that incorporated infrared technology in February 2004. An aircraft flew over the entire refuge and counted the number of deer observed by infrared cameras. That survey counted 231 deer on the refuge (Bernatas 2004). Using that number, we were able to calculate a 93 deer/mi^2 density based on 2.5 mi^2 of prime deer habitat. The majority of the deer were concentrated in the refuge upland habitats (1,630 acres), which was the same area covered by the vehicle-based survey.

Aerial surveys do not assume a 100-percent detection rate, with the exception of grassland cover types, due to the inability to document deer under forested or closed canopies (Bernatas 2004). Usually, a correction factor of 10 percent to 20 percent is added to account for detection in differing forest cover types. Using that correction factor, deer densities ranged between 102 and 111 deer/mi^2. The deer density determined by aerial surveys corroborated the vehicle-based surveys. It is important to note that, even with the inherent variability of population estimates, the lowest deer densities reported were still double the recommended refuge carrying capacity of <25 deer/mi^2, or roughly 60 deer for the refuge and neighboring areas.

All that information leads to the conclusion that we must implement an effective deer management program at the Wertheim refuge. At its current density, the deer herd is negatively affecting our ability to achieve the refuge objective of preserving the natural diversity of plants and animals in their unique habitats.

Availability of Resources

We expect the annual cost of this program to be $24,000. Refuge staff will prepare the annual refuge hunting regulations leaflet, revise the hunt plan and regulations as needed, prepare annual output reports, and respond to public inquiries about the hunt program. Refuge staff will collaborate with and receive assistance from the New York Department of Environmental Conservation in checking hunters in and out and collecting biological information about the deer harvested.

In addition to general staffing, we will ask Service or other authorized federal, state, county and local law enforcement personnel to assist during each day of the hunt. Our regional office will authorize Service law enforcement assistance to ensure a minimum of three refuge officers assist in administering the hunt. In addition to staff expenses, the refuge will incur costs for posting signs, maintaining vehicles, printing leaflets, and miscellaneous supplies.

Initial Costs

Delineating the No-Hunt Zone (materials)	$2,500
Creating parking spaces	2,500
Producing hunt permits	2,000
Designing the hunter orientation course	$1,000
Total	**$8,000**

Annual (recurring costs)

Hunt administration (reservations, check-in/out, check deer)	$4,000
Law Enforcement Officer (detail, overtime)	18,000
Permit printing	1,500
Miscellaneous (signs, equipment, vehicle, etc.)	$500
Total	**$24,000**

We will assess each hunter a non-transferable, non-refundable, seasonal application fee to partially offset the hunt's administrative costs.

Anticipated Impacts of the Use

Short-term Impacts
Hunting will cause a number of short-term impacts on refuge resources. One is increased erosion arising from minor damage to vegetation as hunters move about in the designated hunting zones. We will manage hunter density on the refuge at one per 37± acres. At that density, any vegetation damage or erosion would be insignificant. As hunters move about the refuge hunting zones, they will disturb some wildlife other than deer. However, that disturbance should be minor, without significant impact on other non-targeted wildlife. It is important to note that the hunting zones are located in the upland areas of the refuge, and should not affect migrating waterfowl. In addition, migrating songbirds should have moved through the refuge by the late deer season (November – January).

We expect another impact will be conflict among visitors engaged in hunting and visitors engaged in other priority public uses. The other priority public use visitors now have access to the Carmans River only by boat, and access on foot to the White Oak Nature Trail and the Indian Landing Nature Trail. We will close those trails to non-hunting visitors during the deer hunt in the hunting zones that include those trail systems. There is no hunting on the river, but we will post a sign noting the hunting season. A section of the refuge north of the Montauk Highway is open for fishing. However, that area is not in a hunting zone, so hunters will not conflict with anglers in that area.

Fall weather can extend boating on the Carmans River into January. We will post signs at the main river access points, (i.e., the public car-top launching areas at Montauk Highway and Beaver Dam Road), notifying the public that a deer hunt is in progress. We will coordinate with the local canoe/kayak outfitting business to ensure that its clients know about the hunt seasons on the refuge. We will further instruct hunters that they are not authorized to shoot across waterways, and will reinforce that the 500-foot safety zone from all the waterways defines hunt zone boundaries.

As with all new activities permitted on the refuge, current operations will increase to include law enforcement and maintenance. However, we plan to work with other local, state, and federal law enforcement organizations to provide an increased law enforcement presence during the hunting season. Maintenance will also increase: preparing parking areas, "no-hunt" zones, and the additional maintenance of facilities used by hunters and other priority public use visitors. The refuge will collaborate with other organizations to ensure that all visitors can use properly maintained facilities.

Long-term Impacts
We expect no negative long-term impacts on refuge wildlife or habitats. Instead, we expect positive long-term impacts. We also expect positive impacts on travelers on roads adjacent to the refuge and its surrounding neighbors.

Cumulative Impacts
We expect no negative cumulative impacts.

Public Review and Comment
We are publishing this determination for review concurrently with our comprehensive conservation plan. We discussed this use at CCP public meetings and identified it in our CCP Planning Update. We have already received several comments. An opportunity to comment further will run concurrently with the public review and comment period of the draft CCP and its environmental assessment.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- We will close the refuge to hunting between February 1 and September 30 each year, and establish by annual rule specific "open" hunting dates between October 1 and January 31.
- Hunters may take only white-tailed deer on the refuge. Hunters must first take the number of antlerless deer specified in the refuge hunting regulations before taking an antlered deer.
- Hunters will obtain valid refuge hunting permits from the refuge, and must carry them on their persons while hunting on refuge property.
- Hunters must possess proof of completion of the refuge hunting orientation program upon checking in daily at the designated refuge location.
- Hunters must limit driving to designated access roads, and park in areas designated on the map with the "Wertheim National Wildlife Refuge Hunting Regulations."
- Parking permits distributed by the refuge must be displayed face-up on the vehicle dashboard while hunting.
- Hunters must check in and be at the assigned parking area noted on the refuge permit, and must check out by the time designated on that permit.
- The use of dogs to hunt or pursue game is prohibited.
- Hunters are not allowed to carry a loaded weapon or discharge a firearm within the designated 500-foot "No Hunt Buffer" surrounding the refuge and noted on the hunt map. That includes vehicles and parking areas.
- Hunters must direct shots taken adjacent to the 500-foot "No Hunt Buffer" into the refuge interior and away from public roads or dwellings.
- No person shall kill or cripple any deer without making a reasonable effort to retrieve the deer and retain it in his/her actual custody.
- Hunters in Zone 5 are required to hunt from portable tree stands, and must direct fire away from public roads or dwellings.
- During the special firearms season on the refuge, hunters using shotguns can have in their possession shotgun shells loaded only with slugs.
- Deer hunters must wear a minimum of 400 square inches of hunter orange clothing, visible on head, chest, and back during refuge special firearms season. Camouflage orange does not qualify.
- Portable tree stands are the only type permitted on the refuge, and hunters must remove them at the end of each hunt day.
- Screw-in steps, bolts, or other screw-in materials for tree stands are prohibited.

- Hunters must report all accidents or injuries to refuge personnel as soon as possible, no later than departure from the refuge.
- Failure to comply with federal, state, and refuge regulations will lead to dismissal from the refuge and from participating in future hunts.
- The refuge hunting regulations listed on the hunting permit will be in effect.
- The use or possession of alcohol is prohibited.
- The use of any bait, salt, or enticement is prohibited.
- A non-hunting adult who has a valid NY state hunting license must accompany junior hunters selected.
- The use of flagging or reflective trail markers is prohibited.
- Scouting is allowed only during the designated times and days noted in the refuge hunting regulations.

Justification

White-tailed deer hunting subject to those stipulations will not interfere with the primary purposes for which the refuge was established. Because over browsing by deer has already degraded some refuge habitats, a deer harvest is essential for improving and maintaining the desired habitat conditions and biodiversity on the refuge. The hunting of white-tailed deer will not materially interfere with or detract from fulfilling the mission of the Refuge System or the purposes of the Wertheim refuge.

Project Leader_____ (Signature) _____ 8/24/06 (Date)

Concurrence

Regional Chief_____ (Signature) _____ 8/31/2006 (Date)

Mandatory 15 year Re-evaluation Date _____ August 31, 2021 (Date)

Literature Cited

Augustine, D.J. and P.A. Jordan. 1998. Predictors of white-tailed deer grazing intensity in fragmented deciduous forests. Journal of Wildlife Management 62:1076-1085.

Bernatas, S. B. 2004. White-tailed deer survey for Brookhaven National Laboratory, Wertheim National Wildlife Refuge, and Rocky Point Wilderness Area, Long Island, New York. Vision Air Research, Inc. Boise, Idaho

Brown, S.E. and G.R. Parker. 1997. Impact of white-tailed deer on forest communities within Brown County State Park, Indiana. Proceedings of the Indiana Academy of Sciences. 106:39-51.

Casey, D. and D. Hein. 1983. Effects of heavy browsing on a bird community in deciduous forest. Journal of Wildlife Management 47:829-836.

Connecticut Department of Environmental Protection, Wildlife Bureau. 1988. Publication DR-11.

Cypher, B.L. and E.A. Cypher. 1988. Ecology and Management of White-tailed Deer in Northeastern Coastal Habitats: A Synthesis of the Literature Pertinent to National Wildlife Refuges from Maine to Virginia. USFWS Biological Report 88(15).

Green, Tim. Cultural and Natural Resource Manager. Brookhaven National Laboratory

Krausman, P.R., L.K. Sowls, and B.D. Leopold. 1992. Revisiting overpopulated deer ranges in the United States. California Fish & Game Journal. 78:1-10.

McShea, W.J., and J.H. Rappole. 1992. White-tailed deer as keystone species within forested habitats of Virginia. Virginia Journal of Science 43:177-186.

New York State Department of Environmental Conservation. 1999. Eastern Mud Turtle Fact Sheet. Http://www.dec.state.ny.us/website/dfwmr/wildlife/endspec/mutufs.html.

Obrecht, Holliday. Wildlife Biologist. Patuxent Research Refuge. U.S. Fish and Wildlife Service.

Porter, W.F.1991. White-tailed deer in eastern ecosystems: implications for management and research in National Parks. Natural Resources Report NPS/NRSSUNY/NRR-91/05.

Russell, F.L. and N.L. Fowler. 1999. Rarity of oak saplings in savannas and woodlands of the eastern Edwards Plateau, TX. Southwestern Naturalist 44:31-41.

US Fish and Wildlife Service. 1992. Station Management Plan - Long Island, NY National Wildlife Refuges. Unpubl. Rept. 64pp.

Van Deelen, T.R., K.S. Pregitzer, and J.B. Haufler. 1996. A comparison of presettlement and present-day forests in two northern Michigan deer yards. American Midland Naturalist 135:181-194.

Woolf, A., and J.D. Harder. 1979. Population dynamics of a captive white-tailed deer herd with emphasis on reproduction and mortality. Wildlife Monographs 67:53 pp.

Compatibility Determination

Use
Waterfowl Hunting (Resident Canada Geese)

Refuge Name
Wertheim National Wildlife Refuge

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired Wertheim National Wildlife Refuge in 1947 as a donation from Cecile and Maurice Wertheim, who had maintained the area as a private waterfowl hunting reserve. The authorities for acquiring land at the refuge are the Migratory Bird Conservation Act (16 U.S.C. §715d) and the Refuge Recreation Act (16 U.S.C. §724f(a)(4)).

Refuge Purposes
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? The use is waterfowl hunting for resident Canada geese. Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. §§668dd–668ee) as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted? We will conduct the proposed hunt on the Wertheim refuge along its shoreline of Bellport Bay west of the mouth of the Carmans River and in the Big Fish Creek Impoundment, where we would establish two hunting blinds. We will require hunters who want to hunt from the refuge shoreline of Bellport Bay to provide their own temporary blinds and remove them each day.

(c) When would the use be conducted? Our hunting program will fall within the seasonal framework established by the New York State Department of Environmental Conservation (NYSDEC) for the resident population of Canada geese. Within that seasonal framework, we will specify the days and times when we will permit hunting according to refuge rules.

(d) How would the use be conducted? We must list specific closures and hunting regulations in the annual refuge hunting regulations package, on information kiosks, and in advance media notices. We will reserve at least one blind in the Big Fish Creek Impoundment for disabled or youth hunters (accompanied by a parent or guardian, pursuant to NYS law), and will establish a lottery system to

provide equal access to the impoundment blinds. Hunters would be able to drive to the Big Fish Creek Impoundment to hand-launch a non-motorized boat.

We will allow hunters on the refuge shoreline of Bellport Bay to use motorized watercraft. However, no public launching areas would be provided. Public launching facilities are available nearby at Squassux Landing, the Smith Point County Marina, and other local facilities. We will permit the use of dogs in hunting waterfowl, but the dogs must remain under the control of their owners at all times.

We will honor all state and local laws applicable to hunting. We will enforce the allowable take of Canada geese within NYS bag limits and seasons. All persons interested in hunting on the refuge must possess a valid NYS hunting license and Harvest Information Program (HIP) number. Hunters using the Big Fish Creek Impoundment must provide proof of having taken a NYS-approved Waterfowl Identification Course or equivalent course from another state.

(e) Why is this use being proposed? We are proposing waterfowl hunting for resident Canada geese to provide the public with recreation opportunities identified as priority, wildlife-dependent public uses of the System.

Hunting has been a traditional form of recreation along the Carmans River corridor for generations. The Wertheim family hunted waterfowl and deer along the lower reaches of the Carmans River. Today, waterfowl hunting continues north of the refuge in Southaven County Park and south of the refuge in Great South Bay. Under Service policy, hunting is an acceptable, traditional form of recreation, particularly in areas that historically supported hunting. We may modify hunting opportunities on the refuge for various reasons: considering wildlife populations, maintaining habitat, maintaining a safe and high-quality hunting experience or, in rare instances, protecting a research population.

Resident Canada geese have adapted well to suburban environments. Their populations throughout New York State have increased (USFWS 2002), and have become large enough to negatively affect plantings at wetland restoration sites on and next to the refuge. They are also important game species that provides recreational hunting opportunities for New York hunters.

Availability of Resources

Initial costs include the construction of facilities and purchase of supplies to support the hunt. We estimate annual costs at $4,000. Refuge staff will prepare the annual refuge hunting regulations leaflet, change the hunt plan and regulations as needed, construct or repair hunting blinds, prepare annual output reports, and respond to public inquiries about the hunt program.

In addition to staff expenses, the refuge will incur the costs of posting signs, maintaining vehicles, printing leaflets, and providing miscellaneous supplies. We will request the assistance, as needed, of Service or other authorized law enforcement personnel from federal, state, county or local agencies during the hunt.

Initial Costs

Construct blinds (materials)	$1,500
Create parking space (at impoundment)	500
Produce hunt permits and informational products	500
Design hunter orientation course	$1,000
Total	**$3,500**

Annually Recurring Costs

Administer hunt (reservations; check-in/out)	$500
Construct or remove blinds	$500
Pay law enforcement overtime details	$2,000
Print permits	$500
Miscellaneous (signs, equipment, vehicle, etc.)	$500
Total	**$4,000**

Anticipated Impacts of the Use

The refuge also provides important wintering habitat for the bald eagle, a federal-listed threatened species, and state-listed species including the northern harrier, short-eared owl, and pied-billed grebe. In most years, two or three bald eagles winter on the refuge. They have been observed most often along the main stem of the Carmans River, its major tributaries, and the Big Fish Creek Impoundment from late November to April. Although most research has focused on the disturbance of breeding bald eagles, much of that research would also apply to wintering eagles.

The principal impacts likely would be the disruption of feeding patterns and the displacement from roosts or feeding sites. Both the presence of humans and boating activity have been documented as disturbing eagles (USFWS 1987, Buehler et al. 1991; Debreceni and Badzinski 2003), which at some level may be considered "take" under the Endangered Species Act (16 U.S.C. §1531, et seq.; 87 Stat. 884, as amended). The act defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct." Pursuant to the requirements of that act, we will complete an intra-Service consultation with our New York Field Office. Because bald eagles usually are not present on the refuge in September, we believe that our hunting program is unlikely to affect them adversely.

Pied-billed grebes generally are observed between late September and April on the Big Fish Creek Impoundment (unpublished refuge data). Northern harriers and short-eared owls typically are present from November to April. Given the small size of pied-billed grebes, hunters are not likely to mistake them for Canada geese. Northern harriers and short-eared owls generally are not present on the refuge during the resident Canada goose season. We believe that the waterfowl hunt will not negatively affect those species.

Short-term Impacts

Hunting will have a number of short-term impacts on refuge resources. Two impacts we expect are minor damage to vegetation and increased amounts of litter. Migrating songbirds and shorebirds may be present in September, and hunting may disturb some of them. Because Bellport Bay is a shared waterway, conflicts may arise among hunters and recreational boaters or anglers. However, conflicts among those users should be minimal: along its shoreline, the bay is shallow, with little boat traffic. The Big Fish Creek Impoundment is not open to the public, and we expect no conflicts among users there. The sound of gunfire may disturb some of our residential neighbors, but we will mitigate that by outreach and by restricting the days and times when we permit hunting.

We will post signs at the main river access points, (i.e., public car-top launching areas at Montauk Highway and Beaver Dam Road), to notify the public that a waterfowl hunt is in progress. We will coordinate with the local canoe and kayak outfitter to ensure that its clients receive notice of the hunt seasons on the refuge.

Grazing by large numbers of resident Canada geese has affected wetland plantings and limited the establishment of native wetland annual plant species in the refuge freshwater impoundment and the Beaver Dam Creek restoration site nearby. Removing some of the geese will help us manage and restore habitat for fall and spring migrants, wintering waterfowl, and such water birds as coots and grebes.

As with all new activities permitted on the refuge, our current refuge operations will expand to include law enforcement and maintenance. However, we plan to work with other local, state, and federal law enforcement organizations to provide an increased presence during the hunting season. Maintenance will also increase, primarily in preparing parking areas and maintaining the facilities used by hunters and other priority public use visitors.

Long-term Impacts
We expect no negative, long-term impacts on wildlife or habitats. Instead, removing some resident Canada geese may help alleviate grazing pressure on wetland restoration sites and benefit local schools, golf courses, or other establishments these large numbers of geese affect.

Cumulative Impacts
We anticipate no negative, cumulative impacts.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- We will close the refuge to waterfowl hunting except on specific hunting dates we will establish by annual rule between September 1 and September 30.
- Hunters may take only Canada geese on the refuge. Refuge bag and possession limits will conform to New York State regulations.
- Hunters must have on their persons a valid Wertheim National Wildlife Refuge Hunting Permit while hunting the Big Fish Creek Impoundment. Hunters will obtain permits from the refuge.
- Hunters must possess a New York State hunting license and HIP number. Hunters using the Big Fish Creek Impoundment must also possess proof of having completed an approved Waterfowl Identification course.
- Hunters must limit driving to designated access roads and park in designated areas noted on the map provided with the Wertheim National Wildlife Refuge Hunting Regulations.
- Hunters using the shoreline of Bellport Bay must remove their blinds daily. Permanent blinds are not allowed.
- Hunters using the shoreline of Bellport Bay are restricted to the refuge shoreline of the bay west of the mouth of the Carmans River, no more than 15 feet on the landward side of the mean high tide line.
- Hunters using the Big Fish Creek Impoundment must check out at the refuge and report the numbers of birds taken.
- We will permit the use of dogs in hunting waterfowl; but the dogs must be under the control of their owners at all times.
- No person shall kill or cripple any waterfowl without making a reasonable effort to retrieve it and retain it in his or her actual custody.
- Hunters using the Big Fish Creek Impoundment must use our established blinds. Modifying them or constructing additional blinds is prohibited.

- Hunters must report all accidents and injuries to refuge personnel as soon as possible, but in all cases before leaving the refuge.
- Failure to comply with federal, state, or refuge regulations will lead to dismissal from the refuge and from participation in future hunts.
- The refuge hunting regulations listed on the refuge hunting permit will be in effect.
- The use or possession of alcohol is prohibited.
- The use of any bait is prohibited.
- The use of flagging or reflective trail markers is prohibited.
- An adult with a valid New York State hunting license must accompany junior hunters.

Justification

Hunting during the resident Canada goose season, under the stipulations above, will not interfere with the primary purposes for which the refuge was established. The hunting of resident Canada geese will not materially interfere with or detract from fulfilling the mission of the System or the purposes of the refuge.

Project Leader_____ (Signature) _____ 8/24/06 (Date)

Concurrence

Regional Chief_____ (Signature) _____ 8/31/06 (Date)

Mandatory 15 year Re-evaluation Date _____ August 31, 2021 (Date)

Literature Cited

Buehler, D.A., T.J. Mersmann, J.D. Fraser, and J.K.D. Seegar. 1991. Effects of human activity on bald eagle distribution on the northern Chesapeake Bay. J. Wildl. Manage. 55: 282-290.

Debreceni, S.M. and D.S. Badzinski. 2003. Southern Ontario Bald Eagle Monitoring Project – 2003 Final Report. Bird Studies Canada, Port Rowan, Ontario.

USFWS. 1987. Habitat Management Guidelines for the Bald Eagle in the Southeast Region. Department of the Interior - Fish and Wildlife Service. Arlington Virginia.

USFWS. 2002. Draft Environmental Impact Statement on Resident Canada Goose Management. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia.

Compatibility Determination

Use
Sport Fishing

Refuge Name
Long Island National Wildlife Refuge Complex

Dates Established

Wertheim National Wildlife Refuge	1947
Elizabeth A. Morton National Wildlife Refuge	1954
Target Rock National Wildlife Refuge	1967
Amagansett National Wildlife Refuge	1968
Oyster Bay National Wildlife Refuge	1968
Seatuck National Wildlife Refuge	1968

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired the Wertheim, Morton, Target Rock, Oyster Bay and Seatuck refuges under the authority of the Migratory Bird Conservation Act (16 U.S.C. §715d). Cecile and Maurice Wertheim, who had maintained 2,550 acres as a private waterfowl hunting reserve, donated that land for the Wertheim refuge. We established the refuge under the authority of the MBCA and the Refuge Recreation Act of 166, as amended (16 U.S.C. §724f(a)(4)). We also acquired the Morton refuge (187 acres) and the Target Rock refuge (80 acres) by donation from the Morton and Eberstadt families, respectively. The Town of Oyster Bay donated 2,400 acres for the Oyster Bay refuge, which has deed restrictions for mineral rights and shell fishing leases. We established the Amagansett refuge in 1968 for the management of migratory birds under 16 U.S.C. §667b, which authorizes the transfer of real property for wildlife, or other purposes.

Refuge Purposes

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).
- "…their particular value in carrying out the national migratory bird management program" (16 U.S.C §667b).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? The use is recreational sport fishing, to include fishing from shore or while wading, and fishing from a boat. Fishing is a priority public use of the National Wildlife Refuge System, under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. §668dd–668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted? The Amagansett refuge, in the Town of Easthampton, NY, consists of 36 acres of barrier beach habitat, including a double dune system, swales, and sandy beach (figure C-1). The refuge boundary extends to the mean high waterline of the Atlantic Ocean. In the summer of 2005, a pair of piping plovers (*Charadrius melodus*) nested on the beachfront for the first time in several years, and successfully fledged two young. We erected signs and symbolic fencing around the nesting area, to comply with our Piping Plover Recovery Plan (USFWS 1996). The State of New York lists piping plovers as endangered. The Federal Government lists the Atlantic Coast population of piping plovers as threatened. We would restrict shoreline fishing at the refuge to the beachfront, away from plover nesting areas.

The Elizabeth A. Morton refuge, situated in the Town of Southampton, NY, encompasses a variety of habitats on its 187 acres. Its beaches extend to the mean high waterline of the Noyack and Little Peconic bays. We would permit shoreline fishing along the 1.5 mile peninsula between the bays. Sandy and rocky beaches fringe that peninsula, and provide nesting habitat for ospreys, piping plovers, and least terns between April 1 and August 31 each year. In 2005, six pairs of piping plover nested at the refuge, but due to predation and inclement weather, they fledged only four young. In the last decade, piping plovers have nested at the Morton refuge each year. The least tern colony at the refuge in 2005 succeeded in producing 28 fledglings, down from the 60 young that fledged in 2003. Due to the federal and state listing status of those migratory shorebirds, we would restrict shoreline fishing from nesting areas.

The Oyster Bay refuge, located in the Town of Oyster Bay, NY, includes 3,209 acres of tidal wetlands and marine sub-tidal habitats. We would permit recreational fishing from boats on all navigable refuge waters, which include areas in Cold Spring Harbor, Bayville, Oyster Bay Harbor, and Mill Neck Creek. Those are principally marine waters, although brackish water runs in Mill Neck Creek. Game species in the bay include American eel, bluefish, striped bass, scup, tautog, and flounder. We would also permit fishing along the northern shore of Mill Pond.

The Seatuck refuge, situated in the Town of Islip, NY, comprises 198 acres of tidal wetland, pine barren, warm season grass and open water habitats. We would permit recreational fishing from boats on the navigable waters of the refuge, including a 300-foot by 2200-foot section of the Great South Bay adjacent to the refuge beach. Game species in the bay include American eel, bluefish, striped bass, scup, tautog, and flounder. The flounder species account for the bulk of the recreational harvest in Great South Bay.

The Target Rock refuge, located in the town of Huntington, NY, includes 80 acres of mature oak-hickory forest, tidal wetland, and rocky beach habitats. We would allow shoreline fishing on the rocky beach of the refuge, to give the public access to fishing locations from the rocky beach into Huntington Bay. Shoreline fishing excludes the brackish tidal pond on the nature trail. The beach at Target Rock is also important foraging habitat for piping plovers. As many as two pairs of piping plovers have nested on the sandy beach next to refuge property, most recently in 2000. Historically, portions of that beach were closed to reduce the disturbance of belted kingfishers and bank swallows nesting on the adjacent cliffs. We would prohibit fishing from the shoreline near nesting areas.

The Wertheim refuge, located in the Town of Brookhaven, NY, serves as the headquarters of the Complex. The largest refuge in the Complex, Wertheim encompasses 2,550 acres of forests, grasslands, and wetlands. We would permit shoreline fishing at the fishing access site on the north side of Montauk Highway across from Smith Road.

(c) When would the use be conducted? We would permit sport fishing from sunrise to sunset when the refuges are open to the public. Seasonal restrictions to protect listed species or important nesting habitat for migratory birds would be in place from April 1 to September 1 at the Morton, Target Rock, and

Amagansett refuges. Sport fishing at the Oyster Bay and Seatuck refuges would conform to regulations set yearly by the New York State Department of Environmental Conservation.

(d) How would the use be conducted? Fishing would be conducted in accordance with refuge regulations that apply to all visitors: e.g., no littering, no pets, no feeding or disturbing wildlife or venturing into closed areas. We would also require anglers to adhere to the fishing regulations set by the New York State Department of Environmental Conservation (NYSDEC) each year.

Visitors typically enter the refuges by their entrance roads or by boat. We charge a minimal entrance fee for all persons entering the Morton and Target Rock refuges.

(e) Why is this use being proposed? Sport fishing, whether it is angling from shore, wading in the water, or fishing from a boat, is a priority wildlife-dependent public use of the System.

Availability of Resources

Our maintenance staff installs and maintains fences and signs to designate public access areas at the Wertheim refuge. We estimate that maintaining the present fishing access costs $5,000 a year. That figure assumes no major vandalism of parking areas, fencing, or overlooks. It does not include the amount the state contributes to construct and maintain the boardwalks at that refuge. Law enforcement staff will ensure compliance with refuge regulations.

At the Oyster Bay and Seatuck refuges, refuge maintenance staff maintains boundary signs to designate public access areas. Those refuges are closed to foot travel, thus keeping resources for sport fishing at these refuges to a minimum. Law enforcement staff will ensure compliance with refuge regulations.

The maintenance of refuge trails and facilities includes costs that do not relate directly to shoreline fishing. However, the trails are the only way to access the shoreline fishing locations. Pedestrian travel may add incremental needs for additional trail maintenance. Those include salaries, maintaining trails and facilities, and purchasing materials and other supplies. We keep a bathroom open year-round at each location for public users of the trail system. The kiosks that provide important information to help guide trail users to locations of interest also require regular maintenance and the replenishment of their brochures.

We estimate approximately one day per week at each location for conducting routine maintenance, clearing trails, and providing general upkeep. We estimate the annual cost of maintaining the trails and facilities at $9,000 per refuge, or a total of $27,000, and the cost for law enforcement, resource protection and monitoring at $20,700. The collection of approximately $8,000 in entrance fees at the Morton and Target Rock refuges partly offsets those costs. All visitors at those refuges must have a valid Migratory Bird Stamp or Annual Pass, or pay a $4 use fee.

Anticipated Impacts of the Use

Sport fishing will affect refuge resources. Shoreline and wading anglers, like other visitors, damage vegetation and increase erosion. They disturb wildlife in the vicinity, and deposit litter, which is unsightly and may pose a hazard to wildlife (e.g., fishing line, hooks). They clean fish on refuge lands, which attracts vermin and may detract from the experience of other visitors. The fishing access area at Wertheim is one example: areas of the bank denuded of herbaceous vegetation are eroding, and visitors frequently dispose of litter and fishing line on the bank.

The principal potential impact of recreational sport fishing at the Seatuck and Oyster Bay refuges is the over harvesting of species. The Complex lacks recent fish population data for those areas; therefore, future studies will concentrate on evaluating the likelihood of over harvesting from recreational angling. We can only estimate the likelihood of over harvesting from angling, because all anglers must comply with

New York State fishing regulations. Those are conservative, and limit the take of species with declining populations. Other potential impacts of fishing from boats are the spills of gasoline and motor oil, the release of toxic fumes into the water, and litter that may injure wildlife species.

Sport fish also provide food for many wildlife species, including terns, gulls, wading birds, ospreys, and waterfowl. Whether angling will reduce the prey base for those species is unclear. The removal of adult fish that prey on forage fish similar to those eaten by bird species may reduce competition for prey, but the removal of adult fish of breeding age may reduce the amount of forage fish (i.e., fewer sport fish fry and juveniles available for fish-eating birds).

Cumulative Impacts
We expect no negative cumulative impacts.

Public Review and Comment
We are publishing this compatibility determination for review concurrently with our comprehensive conservation plan (CCP). We have discussed this use at our CCP public meetings, and have identified it in our CCP Planning Update. We have already received several comments. The public review and comment period of the draft CCP and its environmental assessment will offer another opportunity for comments.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- Anglers must comply with all New York State angling regulations.
- Anglers must comply with all refuge regulations concerning restrictions on the time of day or time of year for fishing.
- At the Wertheim refuge, fishing from the shoreline or while wading is permitted only at the fishing access area north of Montauk Highway. Angling at other locations on the refuge is allowed only from a boat.
- At the Morton refuge, anglers are restricted to the shoreline west and south of the observation platform from April 1 to September 1, to protect federal- and state-listed species and nesting ospreys.
- At the Target Rock refuge, anglers are restricted to the shoreline south and east of the observation platform from April 1 to September 1, to protect federal-listed species and nesting bank swallows. The brackish pond is closed to angling year-round.
- The Amagansett refuge is closed to angling between April 1 and September 1 to protect federal-listed species.
- Anglers must not clean their catch or dispose of offal on refuge lands or in refuge waters, and must carry all litter off the refuge.
- Anglers must report all accidents or injuries to refuge personnel as soon as possible, but in all cases before leaving the refuge.

Justification
Fishing is a priority, wildlife-dependent use of the System, through which the public can develop an appreciation for fish and wildlife (Executive Order No. 12996, March 25, 1996; and the National Wildlife

Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997.

Service policy is to provide expanded opportunities for priority uses when they are compatible and consistent with sound fish and wildlife management, and ensure that they receive enhanced consideration during planning and management. Sport fishing from the shoreline, while wading, or while angling from a boat will not materially interfere with or detract from the mission of the System or the purposes for which the refuges were established.

Project Leader_____ _____8/24/06_____
(Signature) (Date)

Concurrence

Regional Chief_____ _____8/31/06_____
(Signature) (Date)

Mandatory 15 year Re-evaluation Date _____August 31, 2021_____
(Date)

Compatibility Determination

Use
Non-Motorized Boating

Refuge Name
Oyster Bay National Wildlife Refuge

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired the Oyster Bay National Wildlife Refuge in 1968 as a donation from the Town of Oyster Bay. The authorities for acquiring refuge lands are the Migratory Bird Conservation Act (MBCA) (16 U.S.C. 715d) and the Refuge Recreation Act (16 U.S.C. 724f(a)(4)).

Refuge Purpose
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? The use is non-motorized boating in Oyster Bay with sailboats, canoes, kayaks, and rowboats. Although boating is not a priority public use of the National Wildlife Refuge System under the Improvement Act, many boaters engage in wildlife observation and photography, and environmental interpretation, which are priority public uses. In 2004, an estimated 26,000 boaters used refuge waters. Part of that use involved non-motorized watercraft, in particular, sailboats.

(b) Where would the use be conducted? We would conduct the use at the Oyster Bay refuge, a unit of the nine-unit Long Island National Wildlife Refuge Complex. Specifically, boating would occur on Oyster Bay and parts of Cold Spring Harbor. The waters are tidal. The refuge manages the water column from the bottom to mean high tide within its borders (see map C-1). Refuge visitors can access most of its waters by using non-motorized boats. Approximately 2,800 acres of open water on Oyster Bay and Mill Neck Creek are available to boaters.

(c) When would the use be conducted? We would allow non-motorized boating all year. Approximately 80 percent of that use occurs between April and September, mostly on weekends and holidays. Parts of Oyster Bay freeze for short periods, but open water generally is present in each month of the year.

(d) How would the use be conducted? Boaters would launch at various launch sites, marinas or legal private docks located in and around Oyster Bay and Cold Spring Harbor, and would be required to operate their craft and possess all safety equipment in accordance with New York State and U.S. Coast Guard regulations.

(e) Why is this use being proposed? The Oyster Bay refuge is mainly open water that provides fish and wildlife habitat and public uses such as fishing, crabbing, oystering, wildlife observation, photography, interpretation and recreational boating. Boating facilitates four priority public uses the refuge offers.

Availability of Resources
We estimate the annual cost of this program at $5,000. Refuge staff will respond to public inquiries about the boat access program, perform law enforcement patrols, and post signs to delineate the refuge boundaries.

Anticipated Impacts of the Use
Non-motorized boating may affect refuge resources in a number of ways. Canoes and rowboats have been shown to disturb wildlife (Bouffard 1982, Kaiser and Fritzell 1984, Knight 1984, Kahl 1991). Boaters may affect waterfowl broods, wintering waterfowl, shorebirds, raptors, and long-legged waders, but the slow speed of non-motorized watercraft and the concentration of their use during the warmer months would tend to mitigate those impacts, especially for wintering waterfowl and raptors.

Cumulative Impacts
We expect no negative cumulative impacts.

Public Review and Comment
We are publishing this compatibility determination for review concurrently with our comprehensive conservation plan. We discussed this use at CCP public meetings and identified it in our CCP Planning Update. We have received several comments to date. An opportunity for further public comment will run concurrently with the public review and comment period of the draft CCP and environmental assessment.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility
- Boaters must comply with all New York State and U.S. Coast Guard requirements.
- Boaters must restrict their activity to daylight hours only.
- Boaters must report all accidents and injuries to refuge personnel as soon as possible, but no later than departure from the refuge.
- Boaters are prohibited from landing or launching their boats on refuge lands.

Justification
The use of non-motorized watercraft on Oyster Bay refuge waters is unlikely to interfere with the primary purposes for which the refuge was established. Many refuge visitors use non-motorized watercraft as part of their participation in priority public uses such as fishing, wildlife observation and photography, and interpretation. Allowing non-motorized boating to occur within the Oyster Bay refuge will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

Project Leader_____ (Signature) _____ (Date)

Concurrence

Regional Chief_____ (Signature) _____ (Date)

Mandatory 10 year Re-evaluation Date _____ (Date)

Literature Cited

Bouffard S.H. 1982. Wildlife values versus human recreation: Ruby Lake National Wildlife Refuge. Trans. North American Wildlife and Natural Resources Conference 47:553-558.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin 19:243-248.

Kaiser, M.S., and E.K. Kaiser 1984. Effects of river recreationists on green-backed heron behavior. J. Wildlife Management 48:561-567.

Knight, R.L. 1984. Responses of wintering bald eagles to boating activity. J. Wildlife Management. 48:999-1004.

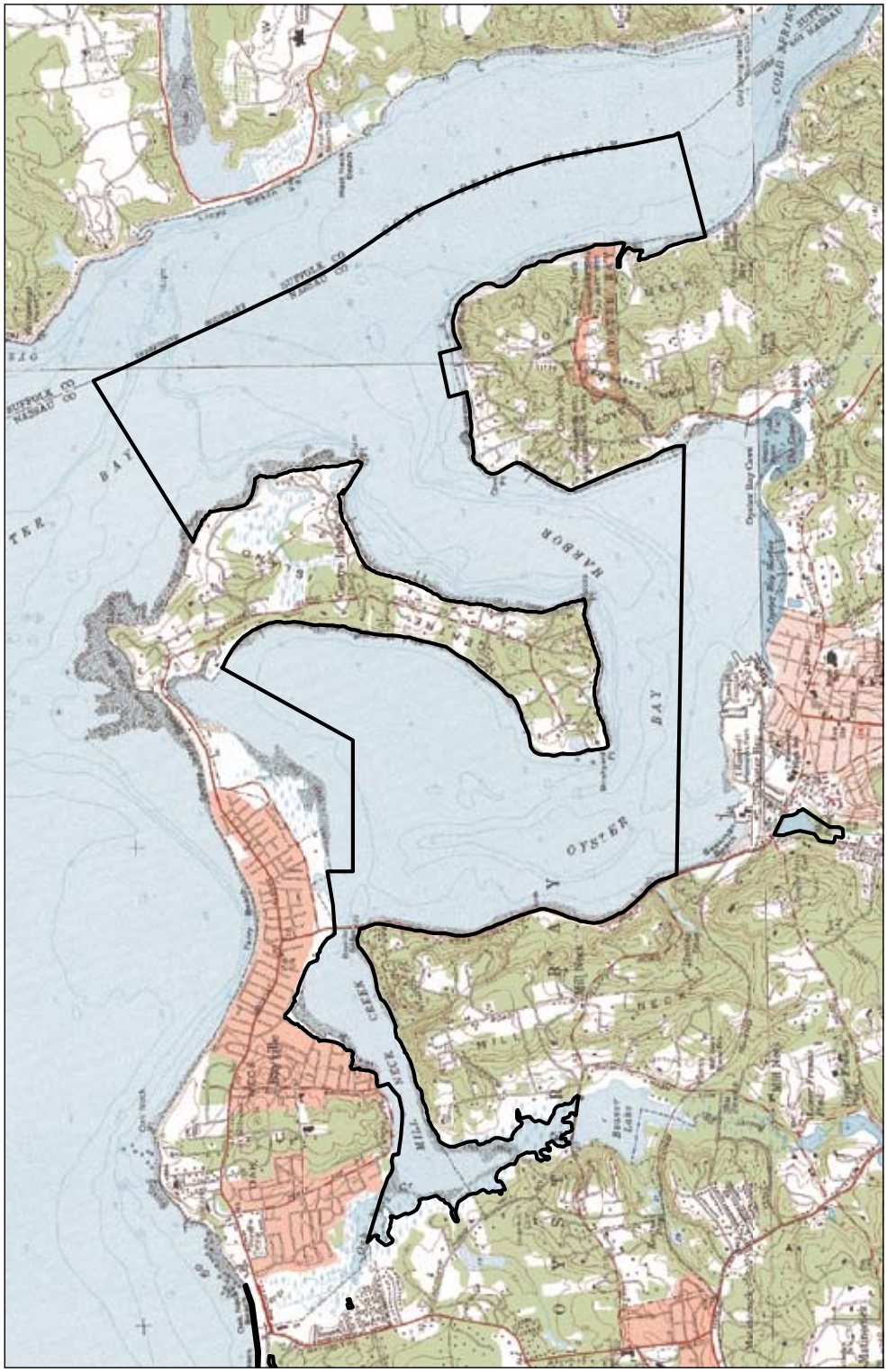
U.S. Fish & Wildlife Service

Oyster Bay National Wildlife Refuge

Nassau County, New York

Map C-1

Non-Motorized Boating



1:54,043

0 1 2 Miles

0 1 2 3 Kilometers

Refuge Boundary
(3,204 Acres)

Produced by Long Island NWR Complex, Shirley, New York
Bathymetric DEM: USGS National Mapping Program
Refuge boundary: USFWS, Region 5, Div. of Realty 2006
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 7/2006

Compatibility Determination

Use
Non-motorized Boating

Refuge Name
Wertheim National Wildlife Refuge

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired the Wertheim National Wildlife Refuge as a donation from Cecile and Maurice Wertheim, who had maintained the area as a private waterfowl hunting reserve. We acquire land for the refuge under the authorities of the Migratory Bird Conservation Act (16 U.S.C. §715d) and the Refuge Recreation Act (16 U.S.C. §724f(a)(4)).

Refuge Purposes

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? The use is non-motorized boating on the Carmans River and its major tributaries. Non-motorized boating is not a priority public use of the National Wildlife Refuge System, under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–668ee) as amended by the National Wildlife Refuge System Improvement Act of 1997. However, many boaters engage in viewing, photographing, or interpreting wildlife, which are priority public uses. In 1993, an estimated 15,000 boaters used the refuge waters.

(b) Where would the use be conducted? We would conduct non-motorized boating at the Wertheim refuge, headquarters for the nine-unit Long Island National Wildlife Refuge Complex. Specifically, boating would occur on the Carmans River and its major tributaries, including the lower reaches of Yaphank Creek, Little Neck Run, and Big Fish Creek. The refuge manages both banks and bottoms within its borders (see map C-2). The lower reaches of the tributaries are tidal, and boats can access some portions of the creeks only at high tide. Approximately 435 acres of open water on the Carmans River, Little Neck Run, and Yaphank Creek are available for non-motorized boating.

(c) When would the use be conducted? We would allow non-motorized boating all year as conditions permit. The Carmans River occasionally freezes for short periods, but open water generally is present in each month of the year. Approximately 80 percent of the use occurs between April and September, mostly on weekends and holidays.

(d) How would the use be conducted? Boaters would launch at the Fishing Access Area north of Montauk Highway. They would be required to operate their craft and possess all safety equipment in accordance with New York State and U.S. Coast Guard regulations.

(e) Why is this use being proposed? The Carmans River is a New York State-designated Scenic River that provides fish and wildlife habitat and public uses such as fishing, crabbing, wildlife observation and photography, interpretation and recreational boating. In addition, the refuge Indian Landing Nature Trail is accessible only by boat. Boating facilitates four of the six priority public uses the refuge offers.

Availability of Resources

We estimate the annual cost of this program at about $5,000. Refuge staff will respond to public inquiries about the program, perform law enforcement patrols, and assist partners with the maintenance of the fishing access site. Refuge staff will receive assistance from the New York Department of Environmental Conservation under a cooperative agreement.

The fishing area launch is an unimproved, hand-launch facility. The Service does not manage the improved launches on the Carmans River. We charge no fees for using the fishing access area.

Anticipated Impacts of the Use

Non-motorized boating can affect refuge resources in a number of ways. Studies show that canoes and rowboats disturb wildlife (Bouffard 1982; Kaiser and Fritzell 1984; Knight 1984; Kahl 1991). They may affect waterfowl broods, wintering waterfowl, shorebirds, raptors, and long-legged waders, but their low speed and their use primarily during the warmer months would mitigate those impacts, especially on wintering waterfowl and raptors. Boaters also may try to access closed portions of the refuge, causing additional disturbance of wildlife.

Cumulative Impacts

We expect no negative cumulative impacts.

Public Review and Comment

We are publishing this compatibility determination for review concurrently with our comprehensive conservation plan (CCP). We have discussed this use at our CCP public meetings, and have identified it in our CCP Planning Update. We have already received several comments. The public review and comment period of the draft CCP and associated environmental assessment will offer another opportunity for comment.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- Boaters must comply with all New York State and U.S. Coast Guard requirements.
- Boaters must restrict their activity to daylight hours only.
- Boaters must report all accidents and injuries to refuge personnel as soon as possible, but before leaving the refuge.

- Boaters are prohibited from landing or launching on refuge lands other than at the Fishing Access Area and Indian Landing.

Justification

The use of non-motorized watercraft on the Carmans River and its major tributaries is unlikely to interfere with the primary purposes for which the refuge was established. Many refuge visitors use non-motorized watercraft to participate in such priority public uses as fishing, wildlife observation, photography and interpretation. Allowing non-motorized boating in Wertheim refuge will not materially interfere with or detract from the mission of the System or the purposes for which the refuge was established.

Project Leader_____ (Signature) _____ 8/24/06 (Date)

Concurrence

Regional Chief_____ (Signature) _____ 8/31/06 (Date)

Mandatory 10 year Re-evaluation Date _____ August 31, 2016 (Date)

Literature Cited

Bouffard S.H. 1982. Wildlife values versus human recreation: Ruby Lake National Wildlife Refuge. Trans. North American Wildlife and Natural Resources Conference 47:553-558.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin 19:243-248.

Kaiser, M.S., and E.K. Kaiser 1984. Effects of river recreationists on green-backed heron behavior. J. Wildlife Management 48:561-567.

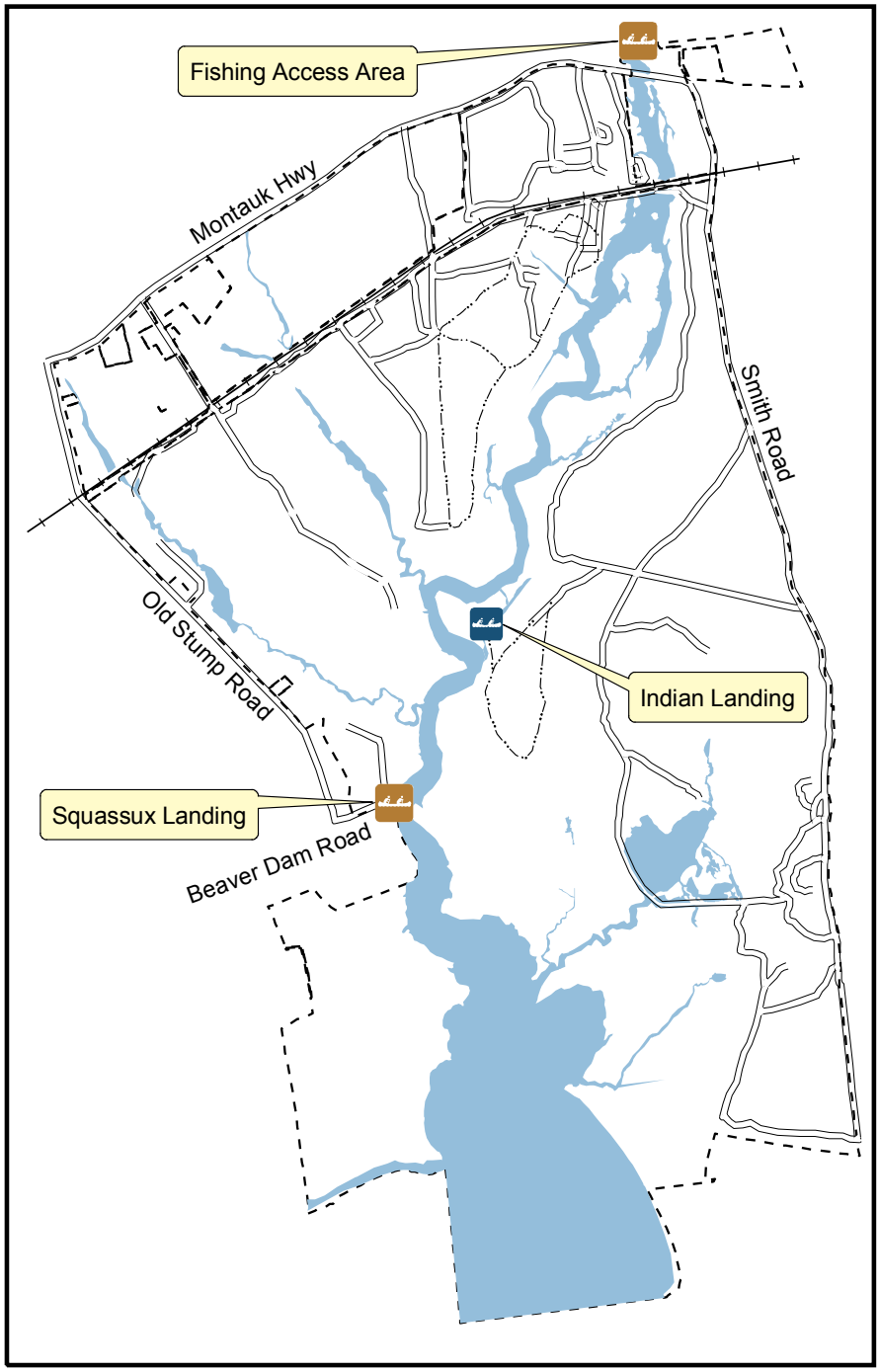
Knight, R.L. 1984. Responses of wintering bald eagles to boating activity. J. Wildlife Management. 48:999-1004.

U.S. Fish & Wildlife Service

Wertheim National Wildlife Refuge
Suffolk County, New York

Map C-2

Boat Launches



Refuge Boundary (2,572 Acres)

See Map 3-15

Nature Trails

Access Road

Railroad

Water

Trail Access via Canoe/Kayak

Shore Fishing Access, Canoe/Kayak Launch

1:28,047

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 2.5 Kilometers

N W E S

Produced by Long Island NWR Complex, Shirley, New York
Refuge boundary: USFWS, Region 5, Div. of Realty 2004
Datum and projection: NAD 1983, UTM Zone 18, Meters
Map Date: 3/2006

Compatibility Determination

Use
Fish Stocking

Refuge Name
Wertheim National Wildlife Refuge

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired Wertheim National Wildlife Refuge in 1947 as a donation from Cecile and Maurice Wertheim, who had maintained the land as a private waterfowl hunting reserve. We established the refuge and acquired its land under the authorities of the Migratory Bird Conservation Act (16 U.S.C. §715d) and the Refuge Recreation Act (16 U.S.C. §724f(a)(4)).

Refuge Purposes

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is this use? Is it a priority public use? No. The stocking of freshwater fish is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–668ee) as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted? We will stock freshwater fish, primarily trout species, at the Wertheim refuge, the headquarters of the nine-unit Long Island National Wildlife Refuge Complex. That 2,550-acre refuge includes the Carmans River and Yaphank Creek, which currently support non-native populations of brown trout and rainbow trout, and small native populations of brook trout; and Big Fish Creek and Little Neck Run, which historically supported brook trout populations and may incidentally support various trout species.

(c) When would the use be conducted? People now fish for trout in the upper reaches of the Carmans River and Yaphank Creek. The New York State Department of Environmental Conservation (NYSDEC) stocks brown trout and rainbow trout in March, April, and May. NYSDEC staff and volunteers stock the upper portion of the Carmans River (between the Long Island Railroad Bridge and Montauk Highway) with 1,000 to 3,000 trout in the 7- to 12-inch size range. About half are brown trout and half are rainbow trout hatched and grown in a NYSDEC hatchery. The trout stocking is part of an agreement between the Service and the NYSDEC on the operation and maintenance of the fishing access area on the north side of Montauk Highway (January 14, 1985).

(d) How would the use be conducted? The NYSDEC would continue stocking as agreed. In undertaking any habitat restoration, we would consider opportunities for restoring native brook trout populations to refuge waters.

(e) Why is this use being proposed? Because the present water quality limits the potential for trout reproduction, stocking provides the public with recreation opportunities identified as priority wildlife-dependent public uses of the System (Pub. L. 105–57; 111 Stat. 1252).

Availability of Resources

No additional resources are necessary to allow the use. The NYSDEC assumes all costs associated with rearing and stocking fish and related activities. The only costs to the refuge would be minimal: administrative costs associated with site visits to the release locations. Our present budget can easily accommodate those minimal costs.

Anticipated Impacts of the Use

Short-term Impacts

Potential direct impacts on the natural resources of the refuge include impacts on the native fish community and the transmission of disease to those fish. Indirect impacts include anglers contributing to increased erosion, littering, and trampling vegetation along the banks and the access trail.

Disease transmission is not a major concern, because the NYSDEC obtains all the trout it stocks from a state hatchery; the state guarantees their health. Our first concern is whether the stocked, non-native trout species will displace or negatively affect the existing fish community. Both species compete with native species for space and prey (Fausch and White 1981, Fausch 1989).

The fish community at the northern part of the refuge, where the NYSDEC stocks the trout, consists of warm and cool freshwater species and various estuarine species. The dominant warm and cool freshwater species include golden shiner, largemouth bass, yellow perch, pumpkinseed, bluegill, common carp, black crappie and chain pickerel. The estuarine species include American eel, various killifish, inland silverside, white perch, striped bass, alewife, blueback herring and bluefish. Native brook trout historically were present there in large numbers, but now are present only in low numbers in the main stem of the Carmans.

One mile south, in the middle section of the Carmans River where its salinity levels start to increase, the fish community is dominated to a much greater extent by such estuarine and marine species as inland silversides, menhaden, alewife, American eel, striped bass, various killifish species, white perch, blueback herring, bluefish and hogchokers. Rainbow and brown trout are present here only in low numbers. They have been sampled with greater frequency in the upper portion of the Carmans River, but only in spring, and usually not as dominants. No rainbow or brown trout reproduction has been documented in the Carmans River on the refuge.

The surface water temperatures of the upper Carmans River in summer frequently exceed 75 degrees. Both trout species tend to prefer cooler water temperatures. Cold-water species occasionally must seek out groundwater seeps or other refuge from high temperatures. Anglers and fish-eating birds largely harvest the stocked trout; their survivorship through the summer months is low. Their impact on the aquatic community is not well known.

Long-term Impacts

Potential long-term impacts include continued competition between non-native trout and native brook trout and competition with such interjurisdictional fish species as alewife and American eel. We are working with partners to improve water quality and fish passage in the Carmans River watershed. If they

improve to the point where the spawning of non-native trout is documented and quality habitat for native brook trout is restored, the stocking of non-native trout species may be curtailed in favor of a "heritage" strain of brook trout.

Cumulative Impacts
We expect no negative, cumulative impacts.

Public Review and Comment
We are publishing this compatibility determination for review concurrently with the comprehensive conservation plan (CCP). We have discussed this use at CCP public meetings and have identified it in our CCP Planning Update. We have already received several comments. Further opportunities for public comment will run concurrently with the public review and comment period of the draft CCP and its environmental assessment.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- We are working with partners to improve water quality in the Carmans River and its tributaries. If it improves to the level where native brook trout populations could be established or enhanced, we would reconsider the stocking of rainbow trout and brown trout, which prey upon and compete with brook trout.

- The NYSDEC will stock only brown and rainbow trout from a state or state-approved hatchery between Montauk Highway and the Long Island Railroad Bridge. The NYSDEC must guarantee the trout as disease-free and suitable for human consumption, and stock them just before or during the trout-angling season in the spring to reduce their competition with native species. All accidents and injuries associated with the stocking program on refuge lands must be reported to refuge personnel as soon as possible, but in any case before leaving the refuge.

Justification
The stocking of non-native trout species will be subject to the stipulations above, and will not interfere with the primary purposes for which the refuge was established. The stocking program has no documented negative impacts, and it increases recreational opportunities for anglers. The stocking of non-native trout will not materially interfere with or detract from fulfilling the mission of the System or the purposes of the refuge. Should additional information become available, we will reconsider this compatibility determination.

Project Leader _____ (Signature) 8/24/06 (Date)

Concurrence

Regional Chief _____ (Signature) 8/31/06 (Date)

Mandatory ~~15~~ 10 year Re-evaluation Date August 31, 2016 (Date)

Literature Cited

Faust, K.D. and R.J. White. 1981. Competition between brook trout and brown trout for positions in a Michigan stream. Canadian Journal of Fisheries and Aquatic Science. 38:1220-1227.

Fausch, K.D. 1989. Do gradient and temperature affect distributions of, and interactions between brook charr (Salvilinus fontinalis) and other resident salmonids in streams? Biology of charrs and masu salmon. H. Kawanabe, F. Yamazaki, and D.L.G. Noakes. Physiological Ecology of Japan Vol. 1: 303-322.

Compatibility Determination

Use
Research by Non-Service Personnel

Refuge Name
Long Island National Wildlife Refuge Complex

Dates Established

Wertheim National Wildlife Refuge	1947
Elizabeth A. Morton National Wildlife Refuge	1954
Conscience Point National Wildlife Refuge	1964
Target Rock National Wildlife Refuge	1967
Amagansett National Wildlife Refuge	1968
Oyster Bay National Wildlife Refuge	1968
Seatuck National Wildlife Refuge	1968
Lido Beach Wildlife Management Area	1969

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired the Wertheim National Wildlife Refuge (refuge) in 1947 as a donation from Cecile and Maurice Wertheim, who had maintained the area as a private waterfowl hunting reserve. We established that refuge under the authorities of the Migratory Bird Conservation Act (16 U.S.C. § 715d) and the Refuge Recreation Act (16 U.S.C. § 460k-1).

Between 1954 and 1968, we also established these refuges under the authority of the Migratory Bird Conservation Act: Conscience Point, Elizabeth A. Morton, Oyster Bay, Seatuck, and Target Rock. We acquired the property for Amagansett refuge in 1968 under the authority of "An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes." The Fish and Wildlife Coordination Act (16 U.S.C. § 661) provides the authority to establish the Lido Beach WMA in the Town of Hempstead in December 1969.

Refuge Purposes

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).
- "…their particular value in carrying out the national migratory bird management program" (16 U.S.C §667b).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use

(a) What is this use? Is it a priority public use? The use is research conducted by non-Service personnel. It is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–668ee) as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted? The locations of the research will vary by project. Usually, a research project is limited to a particular habitat type, plant or wildlife species. On occasion, research projects may encompass an assemblage of habitat types, plants or wildlife. We will limit the locations of research to those areas of the refuge necessary to conduct any specific, approved research project. Nevertheless, we may make the entire Complex available for specific, scientific research projects that require it.

(c) When would the use be conducted? The timing of the research will depend on the project. We may allow scientific research on the refuge throughout the year. A research project could be short-term in design, requiring one or two visits over the course of a few days. Others could be multi-year studies that require daily visits to the study site. The timing of each research project will be limited to the minimum required to complete it. If a research project overlaps a refuge hunting season, special precautions or limitations may be required to ensure the safety of researchers or staff.

(d) How would the use be conducted? The methods of a research project will depend on the project. We will evaluate the methods of each research project before allowing it on the refuge. We will not allow any research project if the refuge manager has not approved its study plan, or if the refuge manager determines the project may adversely affect wildlife, wildlife habitat, on-going or planned refuge management activities, previously approved research programs, approved priority public uses, or public health and safety.

(e) Why is this use being proposed? The purposes of research by non-Service personnel are to further the understanding of the natural resources and improve the management of those resources on the refuges or in the System. We will assign priority to research applicable to wildlife, habitat, or public use management on or near the refuges of the Complex.

Most research projects approved on the refuges of the Complex have examined the management of avian resources, mosquitoes, water quality, public uses, and rare, threatened, or endangered species. Research by non-Service staff now concentrates on five of its refuges and one unit: the Seatuck refuge, Oyster Bay refuge, Target Rock refuge, Conscience Point refuge, Wertheim refuge and its Sayville Unit. Much of that research focuses on the management of migratory birds, but the refuge manager has also approved other, more specific research projects. Much of the research on the Complex is also part of larger, landscape-based projects.

At the Wertheim refuge, the refuge manager has issued special use permits (SUPs) for such research as

- investigating and evaluating Open Marsh Water Management (OMWM) techniques in wetlands to increase the biological control of breeding mosquitoes and eliminate or drastically reduce the spraying of insecticides,
- investigating deer populations and habitat use,
- investigating the American eel populations in the Carmans River, and
- investigating the habitat use and food consumption of American black ducks in winter.

At the Seatuck and Conscience Point refuges and the Sayville Unit, research has included genetic work on sandplain gerardia (*Agalinus acuta*) and investigations of migratory bird populations. At the Oyster Bay refuge, research has focused on studying water quality and determining its impacts on the native oyster population in the bay. At the Target Rock refuge, research has included studies of mosquito and tick populations. Although the refuge manager has not issued SUPs for biological research on the Morton or Amagansett refuges, future research there is likely.

We will encourage and support research and management studies on refuge lands that improve and strengthen our natural resource management decisions. The refuge manager will encourage and assign priority to research that

- relates to approved refuge objectives, clearly improves land management, and promotes adaptive management
- enables better management of the Nation's biological resources
- is generally considered important to agencies of the Department of Interior, including the U.S. Fish and Wildlife Service, the Refuge System, and State Fish and Wildlife Agencies, or
- addresses important management issues or demonstrates techniques for managing species or habitats.

The refuge manager may also consider research for other purposes, which may not relate directly to refuge-specific objectives, but would contribute to the broader enhancement, protection, use, preservation or management of populations of fish, wildlife and plants, and their natural diversity in the region or flyway. Those proposals also must conform to Service compatibility policy.

We may develop a list of research needs that we will provide to prospective researchers or organizations upon request. Our support of research directly related to refuge objectives may take the form of funding, such in-kind services as housing or use of other facilities, staff assistance with the project in collecting data, providing historical records, conducting management treatments, or providing other assistance as appropriate.

Availability of Resources

Staff time spent reviewing research proposals and administering permits will be minimal. In most cases, a research project may require an hour or two of staff time to coordinate all aspects of a project, including review of proposal, issuing a Special Use Permit, coordinating access to the refuge, and reviewing project results. Currently, a senior refuge biologist spends an average of one week a year working full time on research projects conducted by outside researchers. At an hourly wage of approximately $38 (for a GS-11), this adds up to about $1,520.00 annually for resources spent on outside research. Researchers will be required to furnish their own materials and supplies. Supplies and staff time associated with cooperative studies involving the refuge and other agencies or universities should be covered by appropriate refuge/ joint funds.

Anticipated Impacts of the Use

Disturbance to wildlife and vegetation by researchers could occur through observation, a variety of wildlife capture techniques, banding, and accessing the study area by foot or vehicle. Many studies have demonstrated adverse effects of human disturbances, including researcher activity, on wildlife species. For example, Tremblay and Ellison (1979) documented that visits to black-crowned night-heron colonies just before or during laying provoked abandonment of newly constructed nests or either predation of eggs or abandonment of eggs followed by predation. In some instances, investigator disturbance caused mortality of young. Ellison and Cleary (1978) studied the double-crested cormorant to assess the influence of investigators visiting colonies during the breeding season. They discovered that frequent visits caused nest abandonment, predation by gulls, and discouraged late nesting birds from settling in disturbed

experimental colonies. Human presence can affect foraging behavior such as location, duration, and time of day (Burger and Gochfield 1991). It is possible that direct or indirect mortality could result as a byproduct of research activities. If the research project is conducted with professionalism and integrity, potential adverse impacts are likely to be outweighed by the knowledge gained about an entire species, habitat or public use.

However, not all research activities negatively affect a species or its habitat. Frederick and Collopy (1989) found no differences in reproductive parameters in nests of tricolored herons visited frequently (16 times) to those visited infrequently (7 times). Parsons and Burger (1982) reported no differences in black-crowned night heron chick weight between chicks which were handled every two days and those which were handled once during the study.

Studies suggest that the adverse effects of human disturbance are species specific (Gutzwiller et al. 1998). Thus different species are affected by human presence in specific factors such as timing, location, and duration (Gutzwiller and Stanley 1999). Knowing what factors disrupt a species, the probability of disturbing that species during research can be decreased. For instance, Erwin (1989) and Buckley and Buckley (1976) provided management guidelines to minimize disturbance to colonial nesting waterbirds by the general public and investigators. By restricting this activity and monitoring researchers, impacts are expected to be minimal.

Public Review and Comment

We are publishing this determination for review concurrently with our comprehensive conservation plan (CCP). We have discussed this use at CCP public meetings, and have identified it in our CCP Planning Update. We have already received several comments. The public review and comment period of the draft plan and associated environmental assessment will offer additional opportunities for comment.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- We will require all non-Service researchers to submit a detailed research proposal following Service policy (FWS Refuge Manual Chapter 4, Section 6, as may be amended). The refuge must receive at least 45 days to review proposals before research starts. If the collection of wildlife is involved, researchers must give the refuge 60 days to review their proposal. We will assign priority and approve proposals based on their need, benefit, compatibility, and funding required.

- We will issue SUPs for all research conducted by non-Service personnel. Each SUP will list the conditions the refuge manager determines necessary to ensure compatibility, and identify a schedule for progress reports and the submittal of a final report or scientific paper.

- We may ask regional refuge biologists, other Service divisions, state agencies or non-governmental organizations and biologists to provide additional review and comment on any research proposal.

- We will require all researchers to obtain appropriate state and federal permits.

- All research-related SUPs will contain a statement regarding the Service policy on the disposition of biotic specimen. Our current policy states "You may use specimens collected under this permit, any components of any specimens (including natural organisms, enzymes, genetic material or seeds), and research results derived

from collected specimens for scientific or educational purposes only, and not for commercial purposes unless you have entered into a Cooperative Research and Development Agreement (CRADA) with us. We prohibit the sale of collected research specimens or other transfers to third parties. Breach of any of the terms of this permit will be grounds for revocation of this permit and denial of future permits. Furthermore, if you sell or otherwise transfer collected specimens, any components thereof, or any products or any research results developed from such specimens or their components without a CRADA, you will pay us a royalty rate of 20 percent of gross revenue from such sales. In addition to such royalty, we may seek other damages and injunctive relief against you" (USFWS 1999).

- We may terminate any research project at any time for non-compliance with the SUP conditions, or modify, redesign, relocate or terminate it, if the refuge manager determines that it is causing unanticipated adverse impacts on wildlife, wildlife habitat, approved priority public uses, or other refuge management activities.

Justification

Scientific research will comply with the stipulations listed, and will not interfere with the primary purposes for which the refuges were established. We encourage approved research to further understanding of refuge natural resources. It adds greatly to the information available for refuge managers in making proper decisions. Research conducted by non-Service personnel will not materially interfere with or detract from the mission of the System or the purposes for which the refuges were established.

Project Leader_____ (Signature) _____ 8/24/06 (Date)

Concurrence

Regional Chief_____ (Signature) _____ 8/31/06 (Date)

Mandatory ~~2~~ 10 year Re-evaluation Date _____ August 31, 2016 (Date)

Literature Cited

Buckley, P. and F. Buckley. 1976. Guidelines for the protection and management of colonially nesting waterbirds. North Atlantic Regional Office. NPS. Boston, MA 54 pp.

Burger, J. and M. Gochfield. 1991. Human activity influence and diurnal and nocturnal foraging of Sanderlings. Condor. 93: 259-265.

Ellison L. N. and L. Cleary. 1978. Effects of human disturbance on breeding of double-crested cormorants. Auk 95:510-517.

Erwin, R. M. 1989. Responses to human intruders by birds nesting in colonies: Experimental results and management guidelines. Col. Waterbirds 12(1):104-108.

Frederick, R. B. and M. W. Collopy. 1989. Researcher disturbance in colonies of wading birds: Effects of frequency of visit and egg-marking on reproductive parameters. Col. Waterbirds. 12(2):152-157.

Gutzwillwer, K. J. and H. A. Stanley. 1999. Spatial extent of human-intrusion effects on subalpine bird distributions. Condor. 101: 378-389.

Gutzwiller, K. J., H. A. Marcum, H. B. Harvey, J. D. Roth, and S. H. Anderson. 1998. Bird tolerance to human intrusion in Wyoming montane forests. Condor. 100: 519-527.

Parsons, K. C. and J. Burger. 1982. Human disturbance and nestling behavior in black-crowned night herons. Condor 84: 184-187.

U. S. Fish and Wildlife Service. 1982. National Wildlife Refuge System - Refuge Manual Dept. of Interior, USFWS, Washington, D.C.

Tremblay, J. and L. N. Ellison. 1979. Effects of human disturbance on breeding of black-crowned night-herons. Auk 96:364-369.

Compatibility Determination

Use
Beach Use/Sunbathing

Refuge Names
Amagansett National Wildlife Refuge
Elizabeth A. Morton National Wildlife Refuge

Establishing and Acquisition Authorities
The U.S. Fish and Wildlife Service (Service, we, our) acquired the Amagansett refuge in 1968 by accepting the transfer of a former U.S. Coast Guard lifeboat station. We acquire land for the refuge under the authority of the Migratory Bird Conservation Act (16 U.S.C. §§715–715r).

We acquired the Morton refuge in 1954 as a gift from Elizabeth A. Morton. We also acquire land for the refuge under the authority of the Migratory Bird Conservation Act.

Refuge Purposes
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).

- "…their particular value in carrying out the national migratory bird management program" (16 U. S.C §667b).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is the use? Is it a priority public use? The use is sunbathing on the refuge beaches. It is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. §§668dd–668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. However, it is a traditional use at both refuges, mainly from June through August.

(b) Where would the use be conducted? Amagansett refuge, located in the Town of Easthampton, NY, consists of 36 acres of barrier beach habitat, including a double dune system, swales, and sandy beach area (figure C-1). In the summer of 2005, for the first time in several years, a pair of piping plovers (*Charadrius melodus*) nested on the beachfront and successfully fledged two young. Refuge staff erected signs and symbolic fencing around the nesting area to comply with our Piping Plover Recovery Plan (USFWS 1996). The State of New York lists piping plovers as endangered. The Federal Government lists the Atlantic Coast population of piping plovers as threatened.

At the Amagansett refuge, sunbathing occurs on the sandy part of the beach adjacent to the refuge and its waters. Although that part of the beach is inaccessible from refuge land, it is accessible from properties along the beach adjacent to the refuge. The boundary of the refuge part of the beach extends to the mean high tide line. We will close the areas where piping plovers nest to public use. The rest of the beach will be open for sunbathing.

The 187-acre Morton refuge, in the Town of Southampton, NY, encompasses a variety of habitats. We will permit walking along the 1.2-mile Wild Birds Nature Trail (figure C-2) and along the 1.5-mile peninsula between the Noyack and Little Peconic bays. The sandy and rocky beaches that fringe that peninsula provide nesting habitat for ospreys, piping plovers, and least terns between April 1 and August 31 each year. Piping plovers have nested at the refuge each year for the last decade. In 2005, six pairs of piping plovers attempted to nest at the refuge, but due to predation and inclement weather, fledged only four young. The least tern colony at the refuge successfully fledged 28 young in 2005, down from the 60 young that fledged in 2003.

At the Morton refuge, sunbathing occurs on the sandy portion of the refuge beach. One parking lot with a nature trail provides access to the beach. Sunbathing tends to concentrate near that access. During the piping plover nesting season, normally from April 1 to August 31, we close the refuge beach north of the overlook to all public use. The small section of the beach adjacent to the overlook is open year-round for public use.

(c) When would the use be conducted? We would open the Amagansett beachfront to unrestricted sunbathing during the non-nesting season, from September 1 through March 31. From April 1 to September 1, we may close parts of the beachfront to public entry, post "Nesting Area Closed" signs, and erect symbolic fencing. That closure helps ensure high-quality, undisturbed nesting habitat for piping plovers and other beach nesting migratory birds of management concern (e.g., least terns).

At the Morton refuge, the Wild Birds Nature Trail, including the loop and to the beach, will be open daily to pedestrian travel from half an hour before sunrise to half an hour after sunset: i.e., daylight hours only. The 1.5-mile beachfront peninsula will be open to sunbathing during the non-nesting season, from September 1 through March 31, during daylight hours. From April 1 to September 1, we will close the beachfront north of the overlook to all public entry. That closure helps ensure high-quality, undisturbed nesting habitat for piping plovers and other beach nesting migratory birds of management concern (e.g., least terns). Symbolic signs will designate the closed area.

(d) How would be use be conducted? We would conduct the use much as we conduct it today. We allow access along designated nature trails to the beachfront. We close the dunes and vegetated areas on the Complex, including the salt marsh, to public entry throughout the year. Walking on the dunes can harm stabilizing vegetation and cause the erosion and loss of important wildlife habitat. "Closed Area" signs mark the areas closed to public entry.

Visitors traveling on foot typically enter the refuges on their entrance roads, and walk down the trail to the beach. At the Morton refuge, we charge a minimal entrance fee for all persons entering the refuge.

(e) Why is this use being proposed? Thousands of visitors each year enjoy this traditional activity on refuge beaches. About 60 percent of the visitors at the refuges are beach users.

Availability of Resources

To provide beach access, the Morton refuge staff and summer interns spend approximately one day per week clearing trails and performing routine maintenance and general upkeep to maintain the parking lot, kiosk, bathrooms, hiking trail and overlook. The kiosk provides important material and information to help guide refuge visitors to locations of interest. It requires regular maintenance and the replenishment of its brochures.

Due to the dynamic nature of the beach ecosystem, all of those facilities annually require more than 400 hours of maintenance. We estimate the annual cost of that maintenance at $9,000, most of which goes

to salaries. Maintenance materials and other supplies require additional funds. Collecting approximately $4,000 each year in entrance fees partly offsets those costs.

One law enforcement officer patrols weekly during the summer to ensure that visitors comply with refuge regulations. Most of our law enforcement time is associated with beach users during the summer months. We estimate its cost at $4,000 per year.

The Amagansett refuge does not maintain any public facilities. The refuge staff spends very little time on maintenance. In the summer, a refuge volunteer is available to monitor plover nesting activity.

Anticipated Impacts of the Use

Direct Impacts
Public use of the beaches at the Morton and Amagansett refuges is highest from June through August. That high concentration may displace wildlife, including the federal-listed threatened piping plover, which now nests in low numbers at both beaches. Chronic disturbance partly or entirely may displace a bird from an area (Pfister et al. 1992). In 1996, several national wildlife refuges, including the Parker River refuge, investigated the impacts of human disturbance on migrating shorebirds. That study found that shorebirds using the beach are more likely to respond to human disturbance (82 percent) than those using impoundments (30 percent). It also found that, compared with other refuge and non-refuge sites, the disturbance of shorebirds on the Parker River beach is among the highest (8 times per hour) (Harrington and Drilling 1996).

Indirect Impacts
Heavy use of the beachfront can dry out the sand and contribute to beach erosion. Trash left on the beach, particularly food or wrappers can attract predators that feed on nesting piping plovers and least terns or roosting shorebirds. The removal of shells and other natural debris from the refuge beach may also have indirect biological and ecological effects. As they decompose, shells contribute to the nutrient cycle of the beach ecosystem. They create microhabitats that support invertebrate populations, which are important prey for nesting and migrating shorebirds.

Public Review and Comment
We are publishing this compatibility determination for review concurrently with our comprehensive conservation plan (CCP). We have discussed this use at our CCP public meetings and have identified it in our CCP Planning Update. We have already received several comments. The public review and comment period of the draft plan and associated environmental assessment will offer additional opportunities for comment.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- We will continue beach closures to avoid or minimize the disturbance of nesting piping plovers and least terns at the Morton refuge, and consider beach closures at the Amagansett refuge.

- We will continue the volunteer plover warden program to educate the public about the importance of minimizing the disturbance of piping plovers and least terns.

- Visitors will access the beach only via the established trail. We will enforce all closures of dune areas to minimize disturbance.
- We will monitor shorebird use during fall migration to better assess foraging and resting areas.
- We will enforce federal regulations prohibiting the removal of any plant, animal, or parts thereof from the refuge, except under a Special Use Permit.
- We know that beach use disturbs shorebirds that are resting, feeding, and migrating through national wildlife refuges. We do not know the impact of that disturbance on shorebird health and survival. We will continue to look into this issue and, as new information becomes available, may further restrict or eliminate this use in the future.

Justification

We have determined this use to be compatible at its current level, with the stipulations listed above. Under those conditions, we do not expect the use to materially interfere with or detract from the mission of the System, diminish the purposes for which the refuges were established, pose significant adverse effects on refuge resources, or cause any undue administrative burden.

Project Leader_____ (Signature) _____ 8/24/06 (Date)

Concurrence

Regional Chief_____ (Signature) _____ 8/30/06 (Date)

Mandatory 10 year Re-evaluation Date _____ August 31, 2016 (Date)

Literature Cited

Harrington, B.A., and N. Drilling. 1996. Investigations of effects of disturbance to migratory shorebirds at migration stopover sites on the U.S. Atlantic Coast. A report to the U.S. Fish and Wildlife Service, Region 5, Migratory Bird Program. Hadley, Massachusetts. 87 pp.

Pfister, C. B.A. Harrington, and M. Levine. 1992. The impact of human disturbance on shorebirds at a migration staging area. Biological Conservation. 60(2): 115–126.

Compatibility Determination

Use
Mosquito Management

Refuge Names
Wertheim National Wildlife Refuge
Seatuck National Wildlife Refuge

Establishing and Acquisition Authorities
The authorities for establishing and acquiring land at the refuges are "An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes" (16 U.S.C. § 667b; Pub. L. 80–537) and the Migratory Bird Conservation Act (16 U.S.C. §§ 715–715r).

Refuge Purposes
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. §715d).
- "…incidental fish and wildlife-oriented recreational development" (16 U.S.C. §460k-1).
- "the protection of natural resources" (16 U.S.C. §460k-1).
- "the conservation of endangered species or threatened species…" (16 U.S.C. §460k-1).

National Wildlife Refuge System Mission
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252).

Description of Use
(a) What is the use? Is it a priority use? The use is mosquito management, which includes surveillance and, if warranted, control. Mosquito management is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended by the National Wildlife Refuge System Improvement Act of 1997.

Suffolk County Vector Control (SCVC) is the agency tasked with the management or control of mosquitoes, particularly those that breed in salt marshes. This is a controversial topic among Suffolk County residents. We are working with SCVC to manage mosquito populations more vigorously while minimizing impacts on fish and wildlife resources.

One alternative to chemical control is Open Marsh Water Management (OMWM). In cooperation with SCVC and the Suffolk County Heath Department, we started an OMWM demonstration and pilot project at the Wertheim refuge in 2004. Its goals are to reduce mosquito breeding and enhance the wetlands: restore wetland hydrology, increase plant diversity, and create wildlife habitat (see figure C-5). The project examines marsh dynamics and details the effectiveness of different marsh treatments in controlling mosquitoes. We have scheduled the construction phase of the project for completion in March 2006. We are not proposing physical marsh manipulations at the Seatuck refuge.

Mosquito monitoring or control by the aerial application of larvicides or adulticides by SCVC in the tidal salt marshes of the Wertheim refuge and the Seatuck refuge are not priority public uses of the System. However, our interim "National Wildlife Refuge System Mosquito Management Guidelines for 2005"

states "when necessary to protect human, wildlife, or domestic animal health, the Service will reduce mosquitoes associated health threats using an integrated pest management (IPM) approach, including when practical compatible, non-pesticide actions that reduce mosquito production. Except in officially determined health emergencies, any procedure the Service uses to reduce mosquito production will meet compatibility requirements as found in 603 FW 2 and must give full consideration to the safety and integrity of non-target organisms and communities, including federally listed threatened and endangered species."

(b) Where would the use be conducted? Mosquito surveillance or control would be conducted in approximately 450 acres of salt marsh and open water at the Wertheim refuge and 67 acres of salt marsh and open water at the Seatuck refuge. If approved by the refuge manager, SCVC would apply larvicides aerially in designated breeding areas of the marshes at both refuges (see maps C-3 and C-4), or control mosquitoes through source reduction methods such as OMWM. The OMWM demonstration project is located in the eastern marshes of the Wertheim refuge.

(c) When would the use be conducted? Surveillance activities associated with this use would be conducted from May through September under the conditions of this compatibility determination and a special use permit (SUP). Any mosquito control would be based on surveillance data. The SCVC would treat refuge marshes with larvicides only after refuge personnel have determined that mosquito larvae populations are widespread within a marsh unit, and in numbers exceeding 0.2 larvae per dip, a level found to result in an increased risk of disease transmission. Other factors in determining whether treatment would be allowed include marsh hydrology (drying vs. flooding), rainfall, temperature, in-star larval stages and the history of spraying each marsh unit.

In the Wertheim refuge eastern marshes, the construction of the OMWM demonstration project is limited to the months of January through March. The mosquito breeding surveillance, wildlife monitoring, and other scientific data collection will be conducted from May through October. (figure C-6). Three years of post-construction monitoring of each treatment and control site will likely be required.

(d) How would the use be conducted?

Ongoing Monitoring
Currently, SCVC and FWS personnel share the responsibility for conducting weekly mosquito larvae surveys using dip samplers from May through September at seven monitoring units at the Wertheim refuge and six at the Seatuck refuge. SCVC will assume the sole responsibility for conducting those surveys starting in 2008. The sampling consists of walking a prescribed route through each salt marsh unit and periodically taking a dip sample, usually 25 to 50 dip samples per unit, and documenting the number of sample dips, larvae, age classes, marsh description, and GPS location. SCVC compiles those data and provides them to the refuge manager. If the criteria for a specific unit are met—breeding density, marsh hydrology, weather, in-star stage, and temperature—the refuge manager can approve the aerial spraying of larvicide that week at that unit. Each unit can be treated only once per week. Typically, SCVC makes 4 to 10 larvicide applications a year on refuge units.

As part of the mosquito monitoring program, the refuge manager permits SCVC to operate mosquito adult traps on the refuge from May through October. We use those traps to gauge trends in adult mosquito numbers, species composition (which provides information on where they are being produced), and periodically send out specimens to be checked for diseases. If those samples return positive results for the potential transmittal of health risks, and a public health emergency is declared by the appropriate public health agency official within an 8-mile radius of the refuge, the refuge manager may approve the aerial spraying of adulticide after consulting with the regional supervisor. After consulting with officials from SCVC and the public health department, the refuge manager will have the final approval of

treatment areas on the refuge. Adulticide will be sprayed only on the upland sections of the refuge, not in its wetlands.

SCVC is required to report on all mosquito control activities on the refuge for the year. That report usually lists treatment days, units treated on the refuge, the number of acres treated, and the type and quantity of larvicide applied. Tables C-1 and C-2 provide data on the number of acres treated with various larvicides, the pounds of active ingredients, and the number of treatments from 1990–2005.

Demonstration Project Activities
The OMWM demonstration project at the Wertheim refuge has two components: construction and monitoring. The construction component includes creating tidal creeks, tidal channels, shallow spurs, sill channels, and ponds. In addition, many old grid ditches will be filled, and some mosquito-breeding depressions will be regraded using materials excavated during pond construction. Those recommended alterations are based on the hydrology, vegetation, habitat needs for fish and wildlife, existing mosquito breeding sites, and anticipated new breeding sites that would develop once the marsh hydrology has been restored.

To assess the effects of the project on fish, wildlife and vegetation, we have established treatment and control sites in four habitat blocks (Areas 1 through 4). The New York State Department of Environmental Conservation is requiring up to 3 years of post-construction monitoring as a condition of permit. Details about the construction and the monitoring plan are provided in the Suffolk County Vector Control and Wetlands Management Long Term and Generic Environmental Impact Statement Task 12 for the Wertheim National Wildlife Refuge Open Marsh Water Management Demonstration Project Data Report 2003–2004.

(e) Why is the use being proposed? We are proposing this use because one of the management goals for refuge marshes is to provide quality habitat for migratory birds, marsh dwelling water birds, particularly shorebirds, and the American black duck, while at the same time, in the most environmentally sensitive manner possible, minimize significant hatching of biting mosquitoes, thereby reducing the potential for the transmission of disease to humans and wildlife. Both the Wertheim and Seatuck refuges are close to high-density residential areas where interactions among humans and mosquitoes are a health concern.

Availability of Resources
No additional resources will be needed to complete the project. Preparing annual Pesticide Use Proposals, Pesticide Use Reports, and Special Use Permits, and reviewing monitoring reports and annual action reports are functions that we can accomplish at the present levels of refuge funding and staffing.

Anticipated Impacts of the Use
This use has three principal, potential impacts on refuge lands, waters or interests: the disturbance of wildlife caused by the aerial application of larvicides, the impacts on wildlife from the periodic elimination of mosquito larvae from the salt marsh community, and the impacts of larvicides on non-target organisms. All three potential impacts are mitigated by allowing treatments of the marsh only when the criteria for spraying described above have been met, and by requiring the refuge manager's approval. Thus, instead of weekly treatments for 20 consecutive weeks, as at most Long Island salt marshes, the refuge salt marsh typically receives less than half that treatment level. The disturbance of wildlife by aircraft usually lasts only for 20 minutes per salt marsh unit treated, and likely produces fewer disturbances than a ground sprayer. Larvicide treatments are more target-specific and less persistent in the environment than most chemical insecticides, and thus, affect the salt marsh biota less (see "Literature Cited," below).

We also reduce the level of larvicide treatment needed at the refuges by managing the salt marsh as distinct units, monitoring their larvae populations weekly, and allowing treatments only when marsh conditions warrant treatment and widespread mosquito breeding has been documented.

The potential impacts of the OMWM demonstration project consist of the disturbance, displacement, and potential mortality of wildlife during construction, landscape or habitat alterations, hydrologic changes, soil compaction, and in some areas (e.g., fish ponds) reduced vegetation. Specialized, low ground pressure equipment is used during construction to mitigate such factors as vegetation trampling and soil compaction. Measures are in place to avoid or contain discharges of pollutants into the project areas during construction.

We designed the monitoring program to assess the effects of construction on fish, wildlife, vegetation, and their habitats to ensure that the proposed action results in quality habitat for trust species. We integrate the results of that program into the design and construction phases to reduce short-term impacts and ensure no long-term adverse impacts on trust species or their habitats.

However, as in any habitat manipulation, some species will gain habitat and some will lose it. In the OMWM project, species that require areas of open water, such as wading birds, waterfowl and salt marsh fish species, will likely gain some habitat; species such as yellow rail that require high salt marsh may lose some habitat. We will conduct avian surveys before construction and, if necessary, make changes to avoid impacts on state- or federal-listed species or other species of concern.

Public Review and Comment

We are publishing this compatibility determination for review concurrently with our comprehensive conservation plan (CCP). We have discussed this use at our CCP public meetings and in our CCP Planning Update. We have already received several comments. The public review and comment period of the draft plan and its environmental assessment will offer further opportunities for comments.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility

- SCVC must apply for and receive a special use permit annually from the refuge manager.
- Larvae control is to be conducted only when the refuge staff has determined that breeding in specific units is widespread.
- Mosquito surveillance sampling is to be conducted weekly.
- Only Service-approved larvicides may be applied on refuge marshes.
- SCVC will contact the refuge manager at least one day in advance of each application.
- The refuge manager has final approval over all larvae treatments.
- The refuge manager, in consultation with SCVC and public health officials, may authorize the application of mosquito adulticide on the refuges only after evidence shows a potential health risk to the public and wildlife and when the appropriate public health official declares a human health emergency.

- SCVC must provide the refuge manager with a final report before the end of the year of all control activities on the refuges.
- We may rescind this compatibility determination (CD) at any time based on future Service policy determinations or scientific studies of the effects of larvicides on the environment or non-target organisms.
- This CD will be reviewed when the Service finalizes its pending policy on mosquito management, and a new CD will be issued if this CD is not in full compliance with the new policy.

Justification

Mosquito control by SCVC at the refuges as indicated is compatible with the purposes for which the refuges were established. With the stipulations above, this use will not materially interfere with or detract from the mission of the System or the purpose for which the refuges were established.

Project Leader_____ (Signature) 8/24/06 (Date)

Concurrence

Regional Chief_____ (Signature) 8/31/06 (Date)

Mandatory 5 year Re-evaluation Date August 31, 2011 (Date)

Literature Cited

Fleming, W.J.; Heinz, G.H.; Franson, J.C.; Rattner, B.A. 1985. Toxicity of Abate 4E in mallard ducklings and the influence of cold. Environ. Toxicology and Chemistry 4:193-200.

Fortin, C.; Marie, A.; and Leclair, R. 1987. The residual effect of Abate on nontarget communities. J. Am. Mosquito Control Assoication 3:282-288.

Lee, B.M.; and Scott, G.I. 1989. Acute Toxicity of Temephos, Fenoxycarb, Diflubenzuron, and Methoprene and Bacillus thuringiensis var. israelensis to the Mummichog. Bull. Environ. Contamination and Toxicology 43:827-832.

Marten, G.G.; Che, W.; and Bordes, E.S. 1993. Compatibility of cyclopoid copepods with mosquito insecticides. J. Am. Mosquito Control Association 9:150-154.

Mittal, P.K.; Adak, T.; and Sharma, V.P. 1991. Acute toxicity of certain organochlorine, organophosphorus, synthetic pyrethroid and microbial insecticides to the mosquito fish. Indian J. of Malariology 28:167-170.

Parsons, J.T. and Surgeoner, G.A. 1991. Acute toxicities of permethrin, fenitrothion, carbaryl and carbofuran to mosquito larvae during sing pulse or multiple pulse exposures. Environ. Toxicology and Chemistry 10:1229-1233.

Purcell, B.H. 1981. Effects of Bacillus thuringiensis on Aedes taeniorhynchus and some nontarget organisms in the salt marsh. Mosquito News 41:476-484).

Suffolk County Vector Control and Cashen & Associates. 2005. Suffolk County Vector Control and Wetlands Management Long Term and Generic Environmental Impact Statement Task 12 for the Wertheim National Wildlife Refuge Open Marsh Water Management Demonstration Project Data Report 2003 -2004.

U.S. Fish and Wildlife Service. 1992. Station Management Plan — Long Island, NY National Wildlife Refuges. Unpubl. Rept. 64pp.

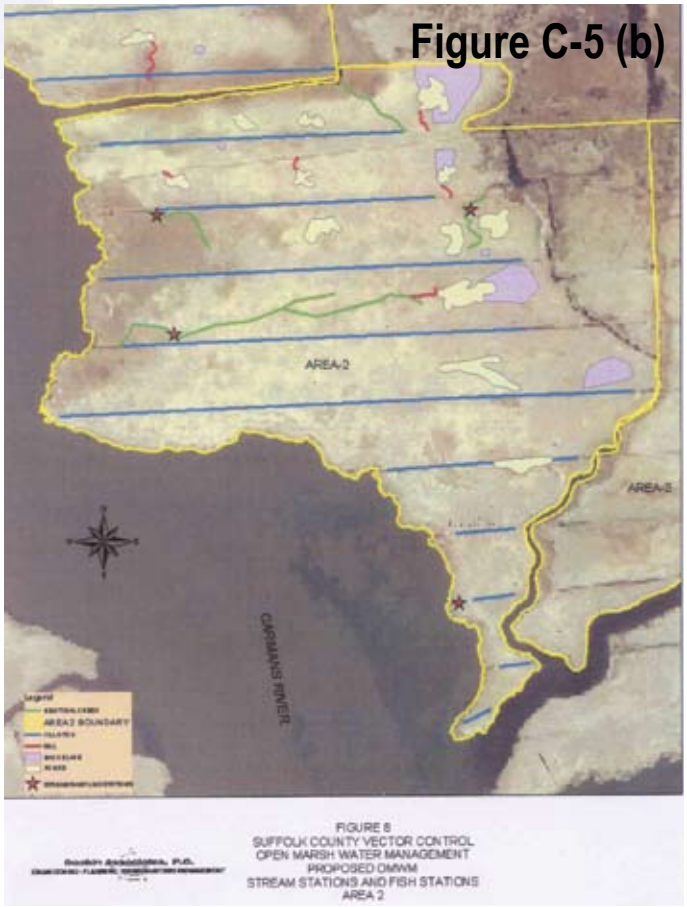
Table C-1. Wertheim refuge acres treated with larvicides between 1990 and 2005.

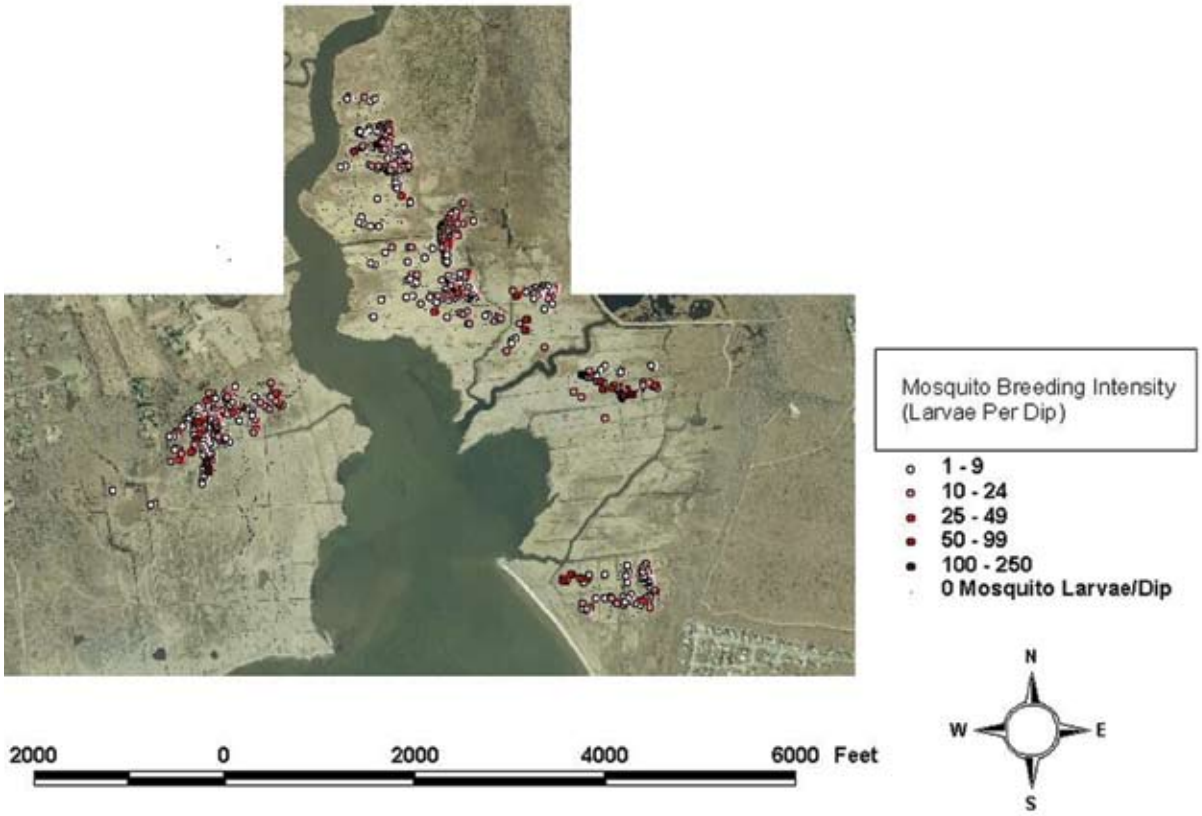
Year of Treatment	*Pesticide Used*	*Pounds of Ingredients*	*Number of Acres Treated*	*Number of Treatments*
1990	VectoBac (CG)	30,000 lbs of AI/acre	3000	12 applications
1991	VectoBac(CG)	14,900 lbs of AI/acre	2250	9 applications
1992	VectoBac (CG)	6,000 lbs of AI/acre	1750	7 applications
1993	VectoBac (CG)	15,000 lbs of AI/acre	1500	6 applications
1994	VectoBac(CG)	31,700 lbs of AI/acre	6300	14 applications
1995	Altosid VectoBac (CG)	12 lbs of AI/acre 32,000 lbs of AI/acre	3600 2700	8 applications 6 applications
1996	VectoBac (CG) Altosid Scourge	3, 600 lbs of AI/acre 14.42 lbs of AI/acre 600 fl. oz	520 3825 1000	1 application 8.5 applications 1 application (EEE) potential threat
1997	Altosid	19.56 lbs of AI	5175	11 applications
1998	Altosid VectoBac (CG)	11.33 lbs of AI/acre 101.3 lbs of AI/acre	3735 450	9 applications 1 application
1999	VectoBac (AS) Altosid	17.01 billion ITU 39 lbs of AI/acre	450 2925	1 application 6.5 applications
2000	Altosid	11.46 lbs of AI/acre	3,415	14 applications
2001	Altosid 20% Conc. VectoBac (AS)	55 lbs of AI/acre 613.7 billion ITU	4,144 1013	15 applications 3 applications
2002	Altosid 20% Conc. VectoBac (AS)	24 lbs of AI/acre 580 billion ITU	1, 769 960	9 applications 4 applications
2003	Altosid 20% Conc. VectoBac(AS) Scourge	10 lbs of AI/acre 38.82 billion ITU 1.27 lbs of AI/acre	3,728 642 1,010	17 applications 4 applications 1 application (West Nile) potential threat
2004	Altosid 20% Conc. VectoBac(AS)	2.4 lbs of AI/acre 283 billion ITU	926 468	6 applications 2 applications
2005	Altosid 20% Conc. VectoBac (AS)	2.8 lbs of AI/acre 10.68 billion ITU	1047 1475	7 applications 8 applications

Table C-2. Seatuck refuge acres treated with larvicides between 1990 and 2005.

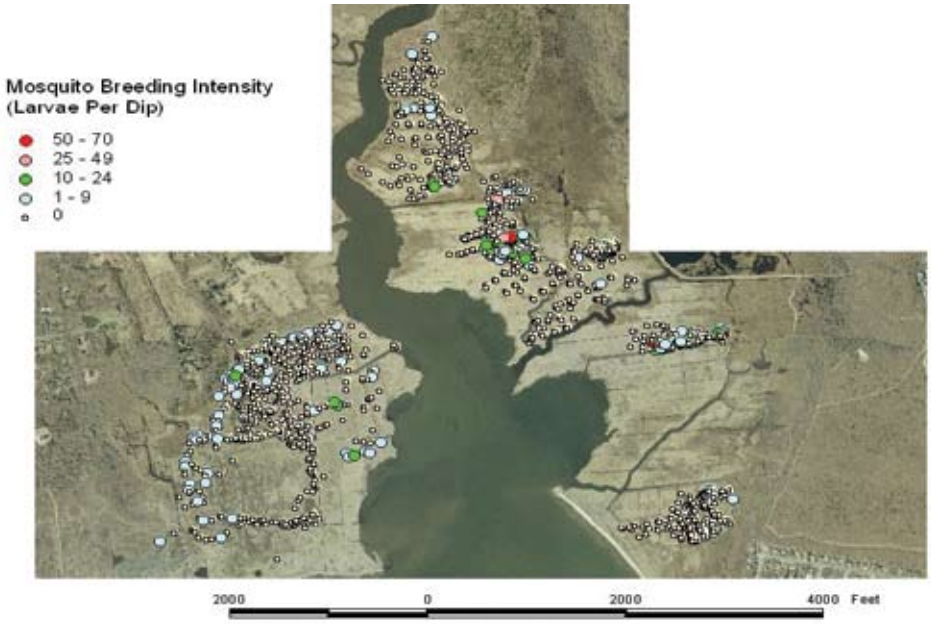
Year of Treatment	*Pesticide Used*	*Pounds of Ingredients*	*Number of Acres Treated*	*Number of Treatments*
1990	VectoBac (CG)	10,500 lbs of AI/acre	1190	17 applications
1991	VectoBac(CG)	11,900 lbs of AI/acre	1190	17 applications
1992	VectoBac (CG)	11,400 lbs of AI/acre	1190	17 applications
1993	VectoBac (CG)	5,840 lbs of AI/acre	630	9 applications
1994	VectoBac(CG)	7,230 lbs of AI/acre	840	10 applications
1995	Altosid VectoBac (CG)	3 lbs of AI/acre 4,600 lbs of AI	910 420	13 applications 6 applications
1996	VectoBac (CG) Altosid	728 lbs of AI/acre 1.6 lbs of AI/acre	140 469	2 application 6 applications
1997	Altosid	2.18 lbs of AI/acre	651	9 applications
1998	Altosid	0.47 lbs of AI/acre	140	2 applications
1999	Altosid	1.6 lbs of AI/acre	490	7 applications
2000	Altosid VectoBac (AS)	2.8 lbs of AI/acre 38.7 billion ITU	834 49	10 applications 1 application
2001	Altosid 20% Conc. VectoBac (AS)	2.23 lbs of AI/acre 139.5 billion ITU	663 230	12 applications 3 applications
2002	Altosid 20% Conc. VectoBac (AS)	6.55 lbs of AI/acre 81.55 billion ITU	487 135	9 applications 4 applications
2003	Altosid 20% Conc. VectoBac(AS)	1.92 lbs of AI/acre 6.055 billion ITU	713 100	4 applications 4 applications
2004	Altosid 20% Conc. VectoBac(AS)	0.65 lbs of AI/acre 120.0 billion ITU	245 130	7 applications 3 applications
2005	Altosid 20% Conc. VectoBac (AS)	0.49 lbs of AI/acre 1.92 billion ITU	182 265	4 applications 5 applications

Figure C-5. New OMWM demonstration wetland restoration project areas. Maps showing the proposed alterations to **(a)** area 1 and **(b)** area 2 of Wertheim's East Marsh. Alterations include filling in mosquito ditches, creating tidal creeks, grading mosquito breeding depressions, and creating fish reservoirs for the purpose of reducing mosquito breeding. *Source: Suffolk County Vector Control and Cashen & Associates.*





Map C-4. Locations of mosquito breeding and non-breeding sites at Wertheim NWR East and West Marshes for 2004.



Map C-5. Locations of mosquito breeding and non-breeding sites at Wertheim NWR East and West Marshes for 2005.

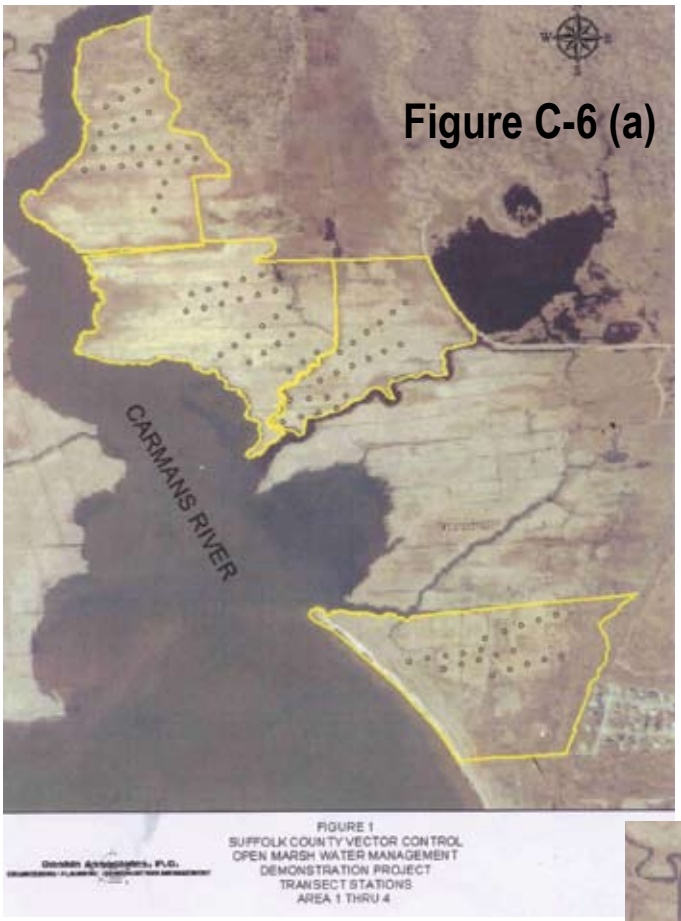


Figure C-6. Biological monitoring transect sites for the new OMWM demonstration wetland restoration project.
(a) Monitoring transect sites for mosquito breeding, vegetation diversity, invertebrate composition, and soil. *Source: Suffolk County Vector Control and Cashen & Associates.*

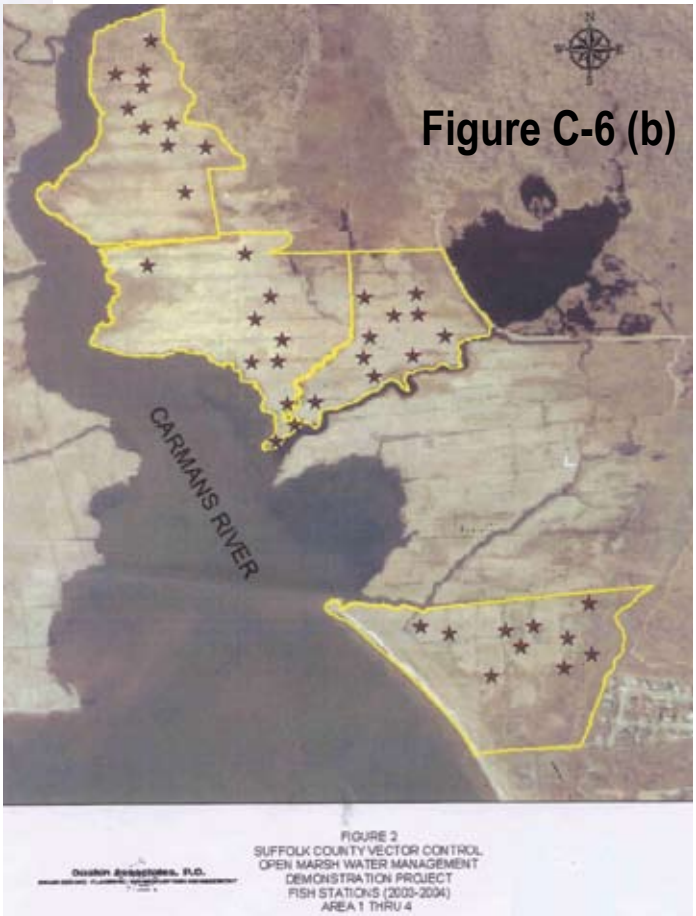


Figure C-6. Biological monitoring transect sites for the new OMWM demonstration wetland restoration project.
(b) Surface water monitoring station locations to measure water salinity and stream water run-off. *Source: Suffolk County Vector Control and Cashen & Associates.*

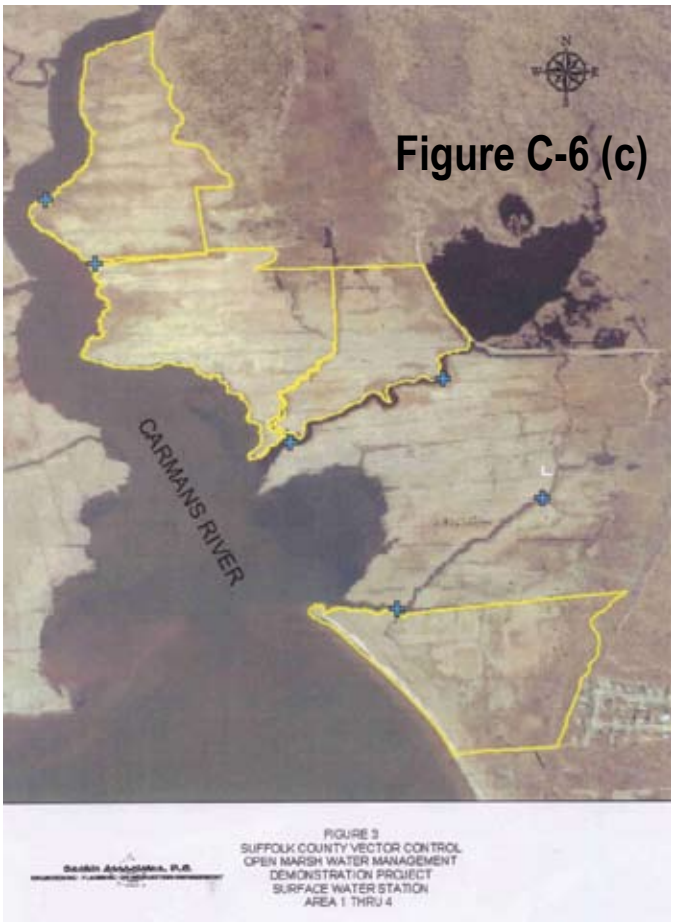


Figure C-6. Biological monitoring transect sites for the new OMWM demonstration wetland restoration project.
(c) Locations of fish monitoring stations.
Source: *Suffolk County Vector Control and Cashen & Associates*.

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Conscience Point National Wildlife Refuge

Appendix D

Wilderness Review

Introduction

The wilderness review process consists of three phases: inventory, study, and recommendation. The purposes of the inventory phase are:

- to identify areas of System lands and waters with wilderness character and establish these areas as Wilderness Study Areas;
- to identify areas of Refuge System lands and waters that do not qualify as WSAs; and
- document the inventory findings for the planning record.

Inventory Criteria

WSAs are areas that meet the criteria for wilderness identified in the Wilderness Act. Section 2(c) provides the following definition.

> *"A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions, and which: (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological or other features of scientific, educational, scenic, or historical value."*

Permanent roads are prohibited in wilderness under Section 4(c) of the Act, so WSAs must also be roadless. For the purposes of the wilderness inventory, a "roadless area" is defined as:

> *"A reasonably compact area of undeveloped Federal land that possesses the general characteristics of a wilderness and within which there is no improved road that is suitable for public travel by means of four-wheeled, motorized vehicles intended primarily for highway use. A route maintained solely by the passage of vehicles does not constitute a road."*

In summary, the inventory to identify WSAs is based on an assessment of the following criteria: absence of roads, size, naturalness, and either outstanding opportunities for solitude or primitive and unconfined recreation.

Because the largest refuge within the Long Island National Wildlife Refuge Complex is only 3,209 acres, the individual refuge units within the Complex were initially assessed based on the size criteria. The size criterion is satisfied for areas under Service jurisdiction in the following situations:

- An area with over 5,000 contiguous acres or 2,000 hectares. State and private land inholdings are not included in calculating acreage.
- A roadless island of any size. A roadless island is defined as a roadless area that is surrounded by permanent waters or that is markedly distinguished from surrounding lands by topographical or ecological features such as precipices, canyons, thickets, or swamps.

- An area of less than 5,000 contiguous acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.
- An area of less than 5,000 contiguous acres that is contiguous with a designated wilderness, recommended wilderness, or area of other Federal lands under wilderness review by the U.S. Forest Service, Bureau of Land Management, or National Park Service.

Inventory Conclusions

As shown in the following table, none of the Wilderness Inventory Areas in the Complex are large enough to meet the size criteria for a WSA.

Wilderness Inventory Area	Acreage in Fee Title
Amagansett NWR	36 acres
Conscience Point NWR	60 acres
Elizabeth A. Morton NWR	187 acres
Lido Beach WMA	22 acres
Oyster Bay NWR	3,204 acres
Sayville Unit	26 acres
Seatuck NWR	209 acres
Target Rock NWR	80 acres
Wertheim NWR	2,572 acres

Wilderness Act of 1964

Public Law 88-577, approved September 3, 1964, directed the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island, regardless of size, within National Wildlife Refuge and National Park Systems for inclusion in the National Wilderness Preservation System.

John Mosesso, Jr./NBII

Eastern box turtles, a state species of special concern, are in decline mainly from habitat loss and collection for the pet trade (Niedzieleski 2002)

Appendix E

Refuge Operations Needs System (RONS) and Service Asset Maintenance Management System (SAMMS)

Table E.1. Tier 1 Refuge Operations Needs System for the Long Island National Wildlife Refuge Complex

Project #	Project Title	Costs $ (x1,000)		
		Year 1	Recurring	FTE
Complex				
95019	Resolve white-tailed deer impacts	$62	$0	
99005	Enhance Visitor Services for refuges (Outdoor Recreation Planner)	$65	$86	1.00
94001	Improve wildfire and prescribed fire program (Refuge Manager)	$65	$86	1.00
98011	Enhance productivity of endangered/threatened beach nesting birds	$36	$0	
93008	Develop a public outreach program (Outdoor Recreation Planner)	$65	$102	1.00
98046	Wetland restoration and monitoring–Long Island Wetland Restoration Program (Equipment Operator)	$65	$70	1.00
98019	Visitor Center/Office Complex (Outdoor Recreation Planner)	$65	$73	1.00
00009	Create auto tour route for proposed visitor center	$540	$0	0.00
Seatuck National Wildlife Refuge				
93283	Provide basic resource and visitor protection (Refuge LE Officer)	$65	$68	1.00
98002	Restore native grasslands and sandplain gerardia habitat	$60	$0	
93183	Provide basic resource and visitor protection (Refuge LE Officer)	$65	$68	1.00
99003	Prepare and implement forest management plan (Resource Specialist)	$65	$73	1.00
93301	Pine barren and wetland vegetative analyses using military satellite imagery (Biologist)	$65	$86	1.00
99002	Prepare and implement a pine barren management plan (Resource Specialist)	$65	$86	1.00
Target Rock National Wildlife Refuge				
95021	Conduct surveys and post boundaries to enhance resource protection	$100	$0	
99001	Enhance natural resource monitoring program (Refuge Manager)	$65	$86	1.00
95017	Provide safe public use trails (Maintenance Worker)	$65	$63	1.00
93210	Enhance public service capabilities and refuge efficiency (Clerk)	$65	$57	1.00

Table E.2. Tier 2 Refuge Operations Needs System for the Long Island National Wildlife Refuge Complex

Project #	Project Title	Costs $ (x1,000)		
		Year 1	Recurring	FTE
Complex				
98025	Investigate impacts of boat mooring and docks on refuge	$100	$100	
00010	Establish and maintain resource management program (Outdoor Recreation Planner)	$156	$107	1.00
03001	Establish public outreach program for the New York Metro Area (Outreach Specialist)	$191	$92	1.00
03003	Protect refuge resources and increase visitor safety (2 Refuge Officers)	$100	$160	2.00
00005	Post boundaries of newly acquired lands	$60	$0	0.00
98053	Develop public outreach video/CD	$71	$0	
00001	An assessment of piping plover productivity–Morton	$53	$0	0.00
98007	Enhance wildlife habitat and restore derelict lands	$36	$0	
02001	Develop and implement forest management plan	$35	$0	0.00
00007	Permanent, professional panels to convey information at annual public meetings	$32	$0	0.00
99003	Increase visitor awareness of natural resources–complex brochures	$81	$0	0.00
98016	Develop public outreach displays	$68	$0	
93176	Construct and maintain fire breaks to protect natural resources, visitors and the community	$155	$3	
00006	Information kiosk on wildlife of strand and marine habitats–Amagansett	$37	$0	0.00
98003	Post boundaries to increase resource protection	$100	$0	
96016	Public outreach program–equipment	$81	$0	
02002	Enhance environmental education opportunities (term ORP)	$69	$6	
95010	Develop, establish, and maintain an effective public use and outreach program	$67	$0	
96010	Implement biomonitoring of environmental status and trends	$59	$0	
94012	Enhance and perform fish, wildlife, and habitat surveys	$71	$0	
93086	Improve nesting opportunities for waterfowl and migratory birds	$36	$0	
90028	Warm season grassland restoration	$27	$76	0.00
93178	Enhance basic natural resource and visitor protection	$78	$1	
98017	Red fox investigation	$48	$0	
98033	Monitor migrant songbirds	$36	$0	
98086	Support public use program by protecting refuge property and equipment–Morton	$33	$0	
98001	Implement wildlife, habitat, and public use projects	$36	$0	
98049	Eastern box turtle study	$36	$0	
93131	Prepare for oil spill response on Long Island	$36	$0	
98071	map underground utilities to improve safety	$35	$0	

Project #	Project Title	Costs $ (x1,000)		
		Year 1	Recurring	FTE
92000	Perform archaeological survey to support natural resource and public use programs	$36	$0	
93126	Communications basics–enhance station's network, computers, and upgrade software	$36	$0	
93312	Reestablish waterfowl banding	$36	$0	
98085	Provide visitor services–construct comfort station at Wertheim	$95	$0	
Seatuck National Wildlife Refuge				
95006	Restore shoreline habitats–Seatuck	$61	$0	
92214	Warm season grassland restoration–Seatuck and Wertheim	$36	$0	
00002	Control invasive plants in uplands	$37	$0	0.00
96043	Protect heavy equipment used for Long Island Wetland Restoration–provide storage area	$71	$0	
99007	Protect endangered species–Sayville unit	$119	$0	0.00
98035	Black duck habitat affinity investigation	$97	$0	
98038	Monitor shorebird abundance across Long Island	$102	$0	
98039	Restore derelict land for wildlife–Seatuck	$32	$0	
93083	Provide basic resource and visitor protection	$75	$184	3.00
98023	Create freshwater impoundments for wildlife–Seatuck	$46	$0	
Target Rock National Wildlife Refuge				
95022	Enhance protection of resources–Oyster Bay boundary survey	$56	$0	
98059	Legal inventory of manmade structures–Oyster Bay	$102	$0	
98080	Enhance resource protection (seasonal Refuge Officers)	$102	$0	
98040	Create recreational and educational information–Oyster Bay	$58	$0	
00012	Create fishing access for the Mill Pond Unit–Oyster Bay	$32	$0	0.00
00011	Develop fishing access site and increased fishing opportunities–Target Rock	$36	$8	0.00
98042	Improve visitor safety and services–public use facilities	$49	$0	
98093	Monitor the plankton and invertebrate community–Oyster Bay	$55	$0	
98029	Coliform investigation–Oyster Bay	$66	$25	
98024	Investigation of the impacts of boat docks, boating and mooring on natural resources	$65	$0	
96999	Mill Pond contaminant investigation	$42	$0	
98050	Waterfowl surveys for Long Island's Great South Bay	$38	$0	
96013	Increase resource protection–patrol boat–Oyster Bay	$59	$0	
96998	Habitat affinities of wintering waterfowl on Long Island	$54	$	

Table E.4. Service Asset Maintenance Management System for the Complex (Deferred Maintenance Backlog)

Location*	Work Order #	Description	$ WO Total Cost
52560	2006507008	Construct Headquarters/Visitor Center Facility - Centennial Legacy Project - [p/d] (child)	$500,000.00
52560	2006506745	Construct Headquarters/Visitor Center Facility - Phase III (cc) (child)	$2,595,000.00
52560	2006507049	Construct Dormitory for Volunteer/Intern Quarters (p/d/c) (child)	$750,000.00
52560	2006507064	Construct Trail and Signs - Wertheim (child)	$62,000.00
52560	2006507066	Construct Trail, Fishing Access and Kiosk for the Wertheim National Wildlife Refuge (child)	$45,000.00
52560	2006507044	Construct Headquarters/Visitor Center Facility - Centennial Legacy Project - Phase II [cc] (child)	$2,595,000.00
52560	2006507015	Construct Visitor Contact at Morton (p/d/c) (child)	$7,057,000.00
52560	2005179563	Replace Bombay Hook Office Specialized Inspection - Archaelogy (child)	$25,000.00
52560	2005179566	Replace Long Island Office Specialized Inspection-Archaelogy (child)	$25,000.00
52561	2005259354	Remove Wertheim Old Buildings at Western Border - Contract (child)	$66,000.00
52561	2005179791	Replace Canary Cottage Quarters - Modular Contract (child)	$740,000.00
52561	2006507078	Construct Signs and Storage Facility at Sayville NWR (child)	$124,000.00
52561	2005259219	Rehabilitate Wertheim Nature Trails - Contract (child)	$32,000.00
52561	2005172515	Repair and Rehabilitate Security Fencing and Fire Breaks - Contract (child)	$92,700.00
52561	2005214242	Remove and Replace Severely Deteriorated Shop/Fire Cache - Removal Contract (child)	$46,000.00
52561	2005251579	Remove and Replace Severely Deteriorated Shop/Fire Cache - Replace Shop/Fire GSA (child)	$525,000.00
52561	2005259363	Remove Quarters 1 and Office/Residence - Contract (child)	$50,000.00
52561	2005259314	Replace Wertheim Boat Dock - Contract (child)	$26,000.00
52561	2005259278	Replace Refuge Signs - Purchase Order (child)	$66,000.00
52561	2005259324	Rehabilitate Wellington Interior - Contract (child)	$167,000.00
52561	2005259296	Rehabilitate Security Alarm System at Complex - Contract (child)	$26,000.00
52561	2005259246	Replace Wertheim Squassux Landing Fencing and Gate - Purchase Order (child)	$26,000.00
52561	2005259255	Replace Eentrance Signs - Purchase Order (child)	$38,000.00
52561	2005173897	Rehabilitate Wertheim Office/Residence - Engineering (child)	$25,000.00
52561	2005172509	Rehabilitate Wertheim Office/Residence - Contract (child)	$171,853.00
52561	2005259268	Remove Wellington Root Cellar, Corn Crib and Shed - Contract (child)	$28,000.00
52561	2005259334	Remove Old Concrete House Foundations - Contract (child)	$27,000.00
52564	2005255707	Replace Boundary Signs at Conscience Point NWR (child)	$27,000.00
52565	2006507068	Construct 3 Wildlife Viewing Pull-Offs and & 1 Observation Towerat Seatuck (child)	$129,000.00
52565	2005213126	Rehabilitate Seatuck Exterior Office/Residence: L-Barn - Replace window & trim (child)	$31,000.00
52565	2005213124	Rehabilitate Seatuck Exterior Office/Residence: L-Barn - Painting (child)	$30,000.00
52565	2005213128	Rehabilitate Seatuck Exterior Office/Residence: L-Barn - Replace Roof (child)	$26,000.00

Location*	Work Order #	Description	$ WO Total Cost
52565	2005213123	Rehabilitate Seatuck Exterior Office/Residence: L-Barn -Replace Shakes (child)	$32,000.00
52565	2005213125	Rehabilitate Seatuck Exterior Office/Residence: L-Barn - Repair brick/ mortar (child)	$49,000.00
52565	2005258541	Rehabilitate Refuge Office/Quarters - Contract (child)	$236,000.00
52565	2005258475	Replace Deer Fencing and Gate at Seatuck - Contract (child)	$58,000.00
52565	2005258467	Replace Regulatory and Boundary Signs Seatuck - Purchase Order (child)	$52,000.00
52565	2005258501	Replace Entrance Gate - GSA Contract (child)	$34,000.00
52565	2005258523	Remove Bulkhead at Seatuck - Contract (child)	$39,000.00
52565	2005258456	Remove Fencing and Structures Seatuck - Contract (child)	$26,000.00
52566	2005255893	Replace Boundary Signs Morton NWR - Contract (child)	$26,000.00
52566	2005255899	Replace Regulatory Signs - Purchase Order (child)	$26,000.00
52566	2005213377	Replace Restroom at Morton - Demolition (child)	$9,000.00
52566	2005213375	Replace Restroom at Morton - GSA Contract (child)	$320,000.00
52566	2005255904	Replace Morton Septic System - Contract (child)	$26,000.00
52566	2005255892	Replace Fencing at Morton NWR - Contract (child)	$26,000.00
52568	2005258966	Construct Information Kiosk at Fishing Access Site - Purchase order (child)	$32,020.00
52568	2006507070	Construct Information Kiosk at Fishing Access Site - Purchase order (child)	$32,400.00
52568	95105039	R5 Target Rock Rehbailitate Refuge Entrance Road (.8 mi.) CN	$87,000.00
52568	2005258973	Replace Target Rock Facility - Refuge Office - Contract (child)	$141,000.00
52568	2005258978	Rehabilitate Target Rock Garage Cow Bar - Contract (child)	$27,000.00
52568	2005258968	Rehabilitate Target Rock Refuge Housing Facility - Contract (child)	$109,000.00
52568	2005258963	Replace Target Rock Bent Pole Automatic Gate - Contract (child)	$26,000.00
		GRAND TOTAL	**$17,586,973.00**

*52560=Complex 52561=Wertheim 52564=Conscience Point 52565=Seatuck 52566=Morton 52568=Target Rock

John Mosesso, Jr./NBII

Canada geese, normally migratory, can become a nuisance as residents.

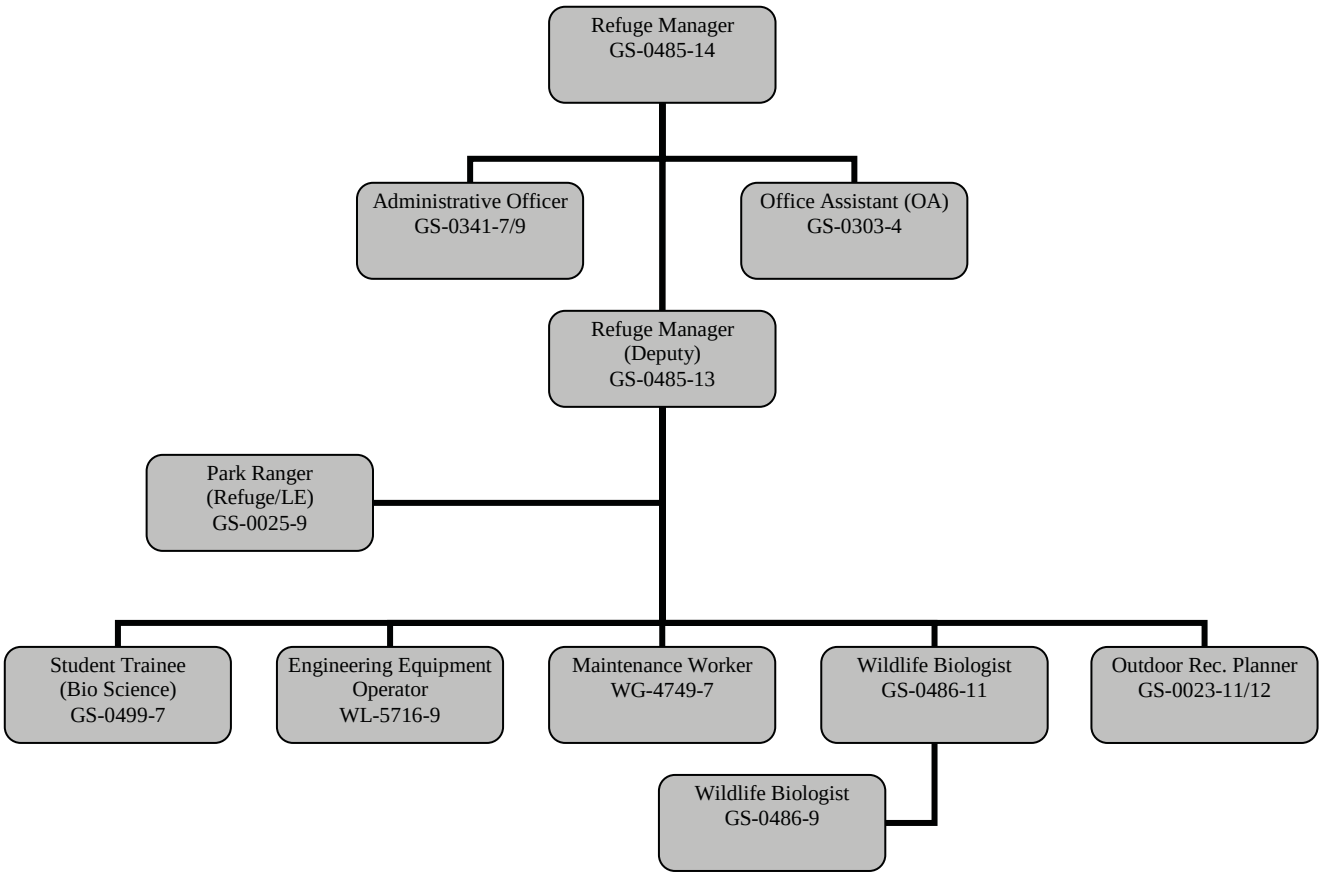
Appendix F

Staffing Chart

U.S. Fish & Wildlife Service
Long Island National Wildlife Refuge Complex

(Wertheim, Oyster Bay, Elizabeth A. Morton, Amagansett, Conscience Point, Target Rock, Sayville, Seatuck)

Staffing Chart



© Mark Wilson

Wigeons forage in freshwater marshes and other wetlands.

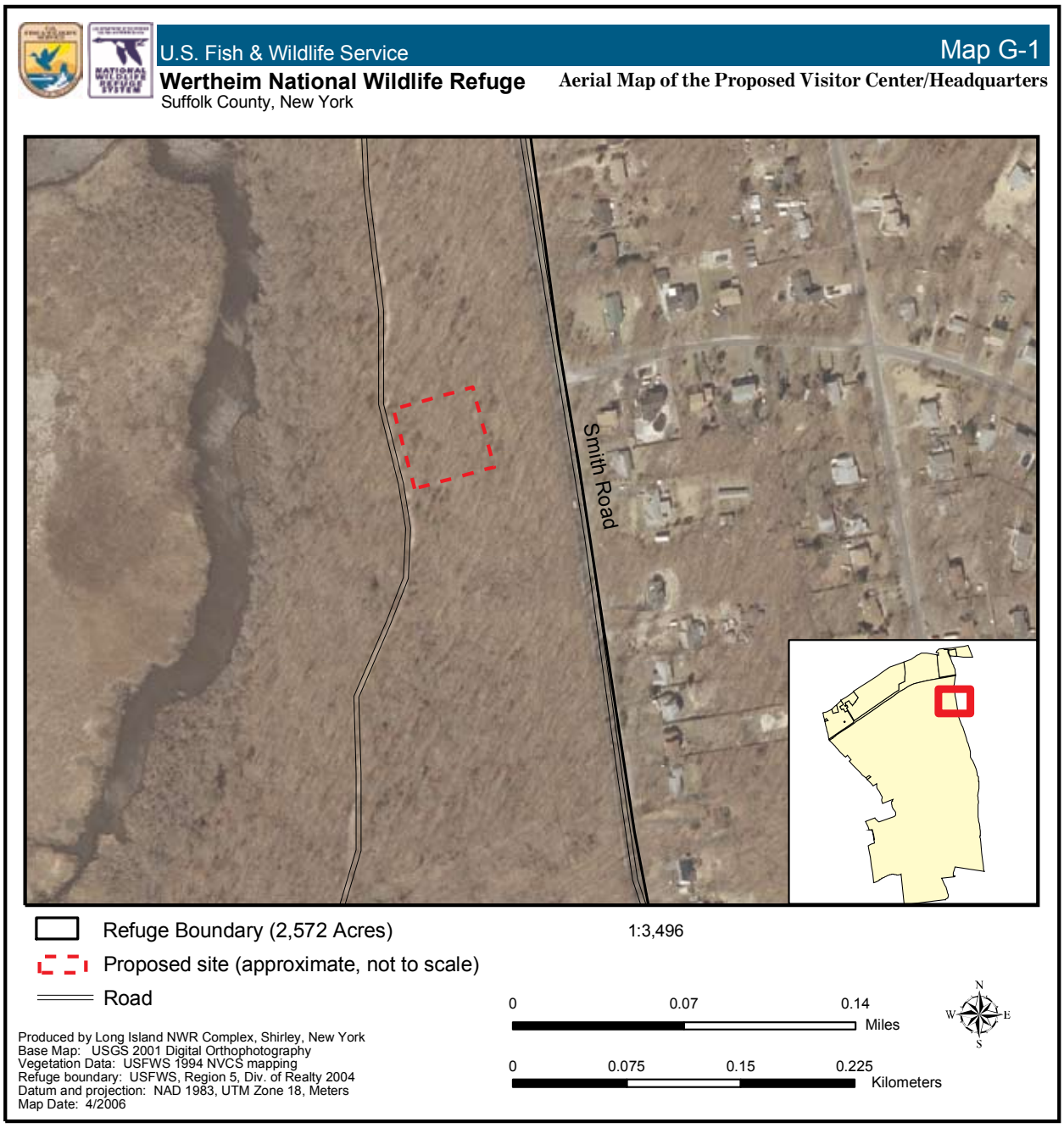
Appendix G

Conceptual Plans

Introduction

The plans for the visitor center/headquarters will closely follow those for a similar facility recently completed at the Rhode Island National Wildlife Refuge Complex. Map G-1 below provides an aerial view of the proposed site described in chapter 4. Please refer to map 4-2 in chapter 4 for details on other proposed facilities associated with the visitor center/headquarters.

The figures that follow are standard plans from the Region 5 family of buildings for a medium-sized facility. Those plans give a general overview of what the proposed visitor center and headquarters will look like. Please note that the final design will vary.



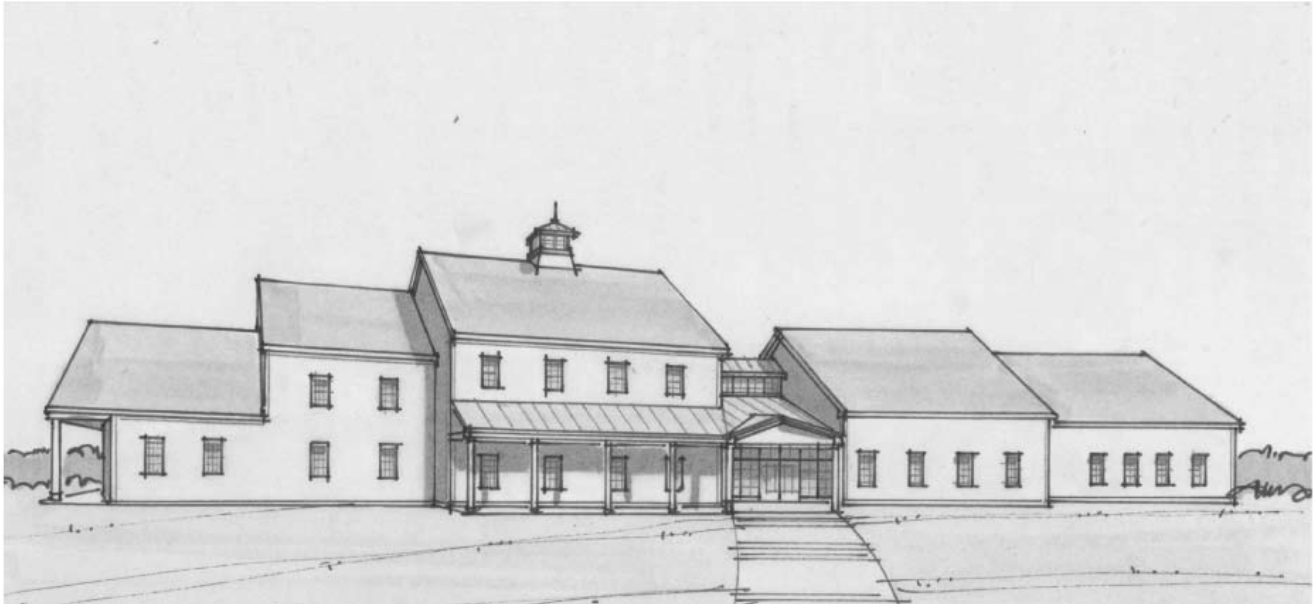


Figure G.1. Medium visitor center/headquarters - Perspective

Figure G.2. Medium visitor center/headquarters - Elevations

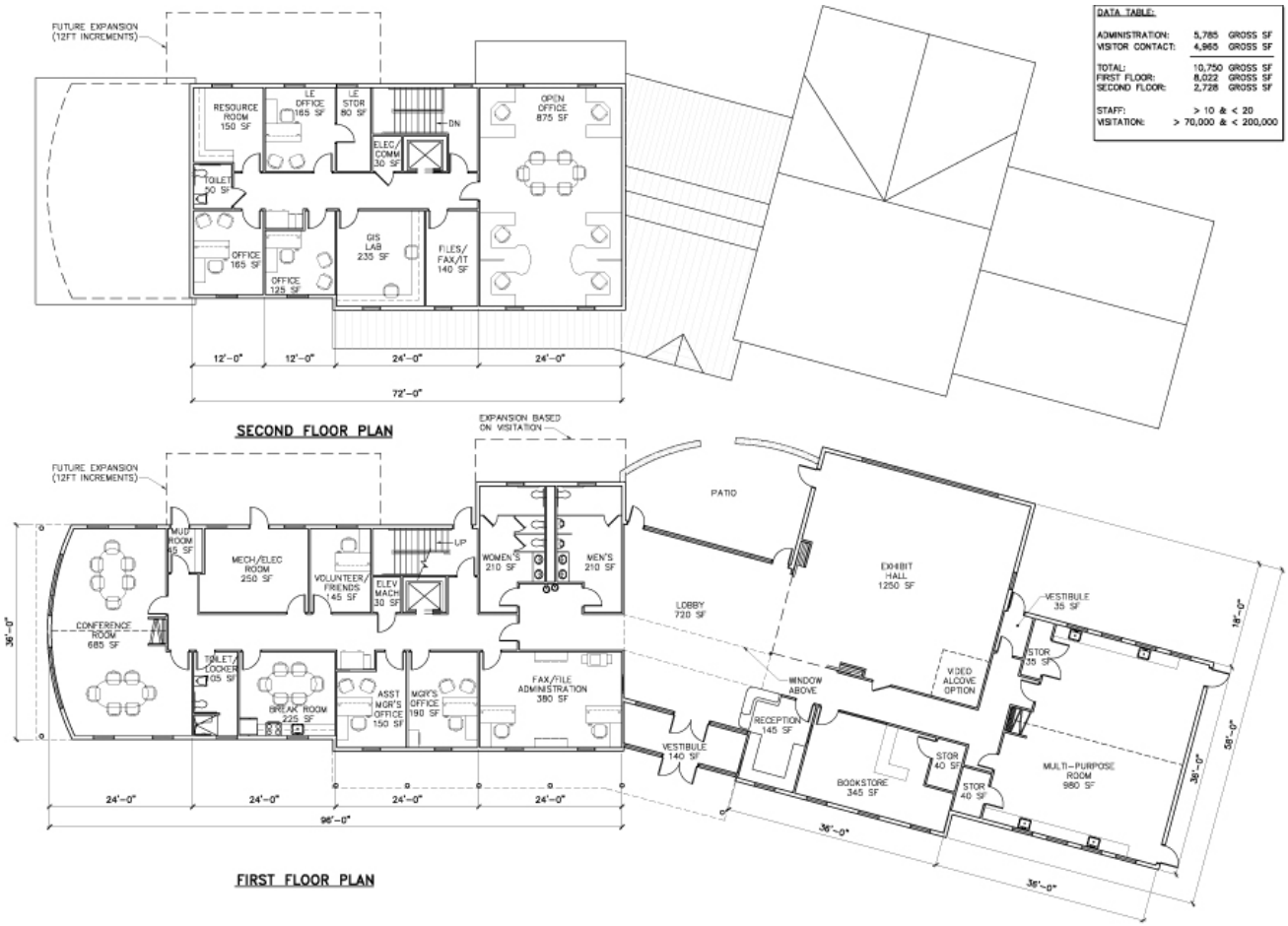


Figure G.3. Medium visitor center/headquarters-floor plans

© Jim Fenton

Piping plovers are a Federal-listed threatened and state-listed endangered species.

Appendix H

Intra-Service Section 7 Biological Evaluation Form

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Deborah Long
Telephone Number: 631/286-0485
Date: August 21, 2006

I. Region:
Region 5 (Northeast)

II. Service Activity (Program):
National Wildlife Refuge System

III. Pertinent Species and Habitat:

A. Listed species potentially present within the action area:

Federal-Designated Endangered and Threatened Species:

1) Bald eagle (*Haliaeetus leucocephalus*) [Threatened (T)]
2) Roseate tern (*Sterna dougallii dougallii*) [Endangered (E)]
3) Piping Plover (*Charadrius melodus*) [Threatened (T)]
4) Atlantic Hawksbill (*Eretmochelys inbricata*) [Endangered (E)]
5) Atlantic Ridley (*Lepidochelys kempii*) [Endangered (E)]
6) Leatherback (*Dermochelys coriacea*) [Endangered (E)]
7) Loggerhead (*Caretta caretta*) [Threatened (T)]
8) Green Sea Turtle (*Chelonia mydas*) [Threatened (T)]
9) Sandplain gerardia (*Agalinis acuta*) [Endangered (E)]
10) American Eel (*Anquilla rostrata*) [Status Review]
11) Shortnose Sturgeon (*Acipenser brevirostrum*) [Endangered (E)]

The Long Island National Wildlife Refuge Complex is in the process of preparing a Comprehensive Conservation Plan (CCP) that is vital for the management of each refuge unit (a total of nine). The final CCP will provide strategic management direction over the next 15 years, by

- providing a clear statement of desired future conditions for habitat, wildlife, visitor services, and facilities;
- providing refuge neighbors, visitors, and partners with a clear understanding of the reasons for management actions;
- ensuring refuge management reflects the policies and goals of the System and legal mandates;
- ensuring the compatibility of current and future public use;
- providing long-term continuity and direction for refuge management; and

- providing direction for staffing, operations, maintenance, and developing budget requests.

The need to develop a CCP for the Complex is two-fold. First, the Refuge Improvement Act requires that all national wildlife refuges have a CCP in place by 2012 to help fulfill the mission of the System. Second, the Complex lacks a master plan that clearly establishes priorities and ensures consistent, integrated management among its nine units.

The refuges of the Complex provide significant, even critical amounts of habitat for the majority of wildlife species known to occur on Long Island. Nearly 500 vertebrate species and approximately 500 species of vascular plants have been documented at the Complex. Many invertebrate species also live on the Complex, including several species of commercial shellfish. The nine refuges are widely spread, and encompass most of the vegetation types on Long Island, which in-turn provide habitat for a variety of wildlife ranging from forest interior nesting Neotropical migrant birds to marine mammals. The coastal location of the refuges also makes them part of a major migration corridor for a variety of birds, including waterfowl, waterbirds, raptors, and songbirds. Appendix A lists birds, mammals, reptiles, amphibians, fish, butterflies, and plants that can be found at the Complex.

State-listed endangered or threatened animal species at the Complex–not already federally-listed–include the golden eagle, black rail and king rail, black, common, and least tern; and short-eared owl, loggerhead shrike, pied-billed grebe, least bittern, northern harrier, upland sandpiper, sedge wren, eastern mud turtle, tiger salamander, northern cricket frog, Hessel's hairstreak, and frosted elfin (USFWS 1995, NYSDEC 2003). See chapter 3, "Affected Environment" of the draft CCP/Environmental Assessment (EA) for more information.

There is no Federally-designated critical habitat within the action area.

B. Proposed species and/or proposed critical habitat within the action area
None

C. Candidate species within the action area:
None

American Eel Status Review
A Status review for the American eel (*Anquilla rostrata*) is currently being undertaken pursuant to the Endangered Species Act. The American eel may be found in a variety of aquatic habitats ranging from coastal to freshwater riverine, bays, and stream estuaries. Eight of the nine refuge units qualify as habitat for the American eel. They are: Amagansett, Conscience Point, Morton, Oyster Bay, Seatuck, Target Rock, and Wertheim refuges and Lido Beach Wildlife Management Area.

D. Include species/habitat occurrence on a map.

IV. Geographic area or station name and action:
Long Island National Wildlife Refuge Complex – Comprehensive Conservation Plan. Units of the Complex in Nassau County include Lido Beach Wildlife Management Area and Oyster Bay National Wildlife Refuge. Units of the Complex in Suffolk County include Amagansett, Conscience Point, Morton, Seatuck, Target Rock, and Wertheim National Wildlife Refuges, and the Sayville unit of Wertheim refuge. See chapter 3, "Affected Environment" of the draft CCP/EA for maps.

V. Location (attach map):
Maps are found in chapters 1 through 3 of the draft CCP/EA.

A. Ecoregion Number and Name:
The North Atlantic Coastal Ecoregion

B. County and State:
Suffolk and Nassau Counties, New York

C. Section, township, and range (or latitude and longitude):
Refer to the draft CCP/EA Introduction and Chapters 2-4.

D. Distance (miles) and direction to nearest town:
Project area covers a juxtaposition of different habitats and ecosystems across an estimated 80 miles of Long Island.

E. Species/habitat occurrence:

1) **Bald eagles** principally use the refuges while migrating or wintering, and are associated with aquatic or wetland habitats and their adjacent terrestrial borders.

2) **Roseate tern** are associated with intertidal or strand habitats. They rest and feed along the beach strand areas of Morton, Amagansett, Oyster Bay, and Wertheim refuges. Morton refuge is a former breeding area for roseate terns.

3) **Piping plover** are associated with intertidal or strand habitats. Breeding habitats are located at Morton and Amagansett refuges from March through September. At Target Rock, piping plover forage along the refuge shoreline.

4) **Atlantic hawksbill** sea turtles depend on subtidal habitats which can be found at Wertheim, Oyster Bay, Amagansett, and Seatuck refuges.

5) **Atlantic ridley** sea turtles depend on subtidal habitats which can be found at Wertheim, Oyster Bay, Amagansett, and Seatuck refuges.

6) **Leatherback** sea turtles depend on subtidal habitats which can be found at Wertheim, Oyster Bay, Amagansett, and Seatuck refuges.

7) **Loggerhead** sea turtles depend on subtidal habitats which can be found at Wertheim, Oyster Bay, Amagansett, and Seatuck refuges.

8) **Green** sea turtles depend on subtidal habitats which can be found at Wertheim, Oyster Bay, Amagansett, and Seatuck refuges.

9) **Sandplain gerardia** is part of a fire-dependent grassland community located at the Sayville unit of Wertheim refuge and at Seatuck and Conscience Point refuges.

10) **American eel** habitat can be found at Amagansett, Conscience Point, Morton,

Oyster Bay, Seatuck, Target Rock, and Wertheim refuges and at Lido Beach Wildlife Management Area.

11) **Shortnose sturgeon** can be found in the Hudson River. None have been found within any refuges in the Complex to date, but potential habitat occurs at Wertheim, Seatuck, Morton, and Oyster Bay refuges.

For more information and details, please refer to chapter 3, "Affected Environment" of the draft CCP/EA.

VI. Description of proposed action (attach additional pages as needed):
The proposed actions and alternatives selected by the Service are described in Chapter 2 of the draft CCP/EA.

VII. Determination of effects:

A. Explanation of effects of the action on species in item III:
Refer to Chapter 4 of the draft CCP/EA for more information and details.

The proposed actions selected by the Service provide more potential habitat for fish and wildlife species native to the waters, wetlands, and forest associated with the North Atlantic Coastal Ecoregion. The Long Island National Wildlife Refuge Complex plans to preserve, manage, and restore some of the last significant natural areas for wildlife on Long Island, New York. The Complex's proposed actions will incorporate methods such as restoration, habitat management, and/or monitoring of important wildlife habitats, ranging from coastal systems to native grasslands to mature forests. The proposed management actions presented in the CCP for each of the nine distinct units will provide support for threatened and endangered species in addition to hundreds of species of migratory birds and other wildlife within the Atlantic Flyway. Future actions will be coordinated with NYSDEC (New York State Department of Environmental Conservation) and NOAA (National Oceanic and Atmospheric Administration)/Fisheries.

From the draft CCP/EA, (Chapter 2, Actions Common to All Alternatives), Goal One states we will improve the biological diversity and integrity of upland cover types to sustain high-quality habitat for migratory passerine birds, proposed actions include managing land with prescribed burns. Prescribed fire is a management tool that has and may be used to maintain and enhance grasslands including endangered fire-dependent plant communities. This will have a beneficial effect on the Federally-listed sandplain gerardia.

Goal 3 ("to restore and increase the biological diversity and integrity of native grasslands to foster endangered plant recovery") specifically addresses current and future access to areas supporting sandplain gerardia, and provides a commitment to continue to assist the The Nature Conservancy in managing a 101 acre site adjacent to the Sayville Unit of Wertheim Refuge, currently under the ownership of the Federal Aviation Administration. Additional recovery strategies for sandplain gerardia include incorporation of tree/shrub clearing, protecting established sites from unwanted disturbances (such as unauthorized ATV use), identification of potential reintroduction sites, coordination with the species recovery team, and monitoring the progress of newly established plots. This will also have beneficial effects on sandplain gerardia.

Goal 4 ("to enhance the functionality of coastal strand habitat as they relate to beach-nesting colonial water birds and shorebirds to meet optimal population levels") describes management activities that are taking place, and will be continued. These include strategies to: closing sections of beach for the plover and tern nesting season; prohibiting public access; providing seasonal plover stewards and periodic patrols by refuge staff who erect predator exclosures; monitoring nesting success and assessing the relative abundance of predators. In other areas, as appropriate, the refuge installs symbolic fencing and will install artificial nest structures for roseate terns. Finally, volunteers and seasonal staff meet and provide listed species conservation education for the public. These actions will result in beneficial effects on piping plovers, roseate terns, and other associated State-listed species.

Goal 4, Objective 2 strategies include reducing the density of beach grass adjacent to breeding areas, creation of new intertidal foraging areas, assessing predator management needs and developing a plan; patrolling nesting areas during breeding and growing season, restricting access to breeding and growing areas, managing former dredged material disposal sites, and exploring active management/creation of suitable habitat. These management actions will provide beneficial effects to the piping plover and roseate tern.

Sea turtles occasionally forage and migrate in the offshore and nearshore subtidal areas within the Refuge Complex, and usually during the summer months. There is no information available that would suggest that any breeding by any listed sea turtle species takes place on refuge lands, or that there is suitable habitat for breeding present on refuge lands. No habitat management proposed for intertidal areas within the Complex would affect the subtidal areas where turtles may occur. In the event that additional information on listed sea turtles or their habitat becomes available, the determination of no effects may be reconsidered.

Wertheim National Wildlife Refuge typically supports 1 to 3 immature bald eagles between late November and Mid-April. Most observations have occurred along the main stem of the Carmans River and the Big Fish Creek Impoundment. As stated in the draft CCP/EA on page 4-21, bald eagles are commonly observed perching in trees adjacent to the location chosen for the proposed Headquarters/Visitor Center. If they continue to roost there, when the new facilities are constructed, they may in the future occasionally be disturbed by human activities. However we believe that such disturbances would result in no more than insignificant or discountable direct, indirect or cumulative adverse effects. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs, and discountable effects are those extremely unlikely to occur. In the event that bald eagles establish a nest in the vicinity of the proposed Visitor Center, or if they significantly change their use of the available habitat, or if construction activities must take place in a manner and at a time of year such that they may significantly disturb the eagles, this determination may be reconsidered.

Information on the occurrence of listed species and their habitats is frequently updated; thus, Refuge Complex staff will continue to consult with the Service's Ecological Services (ES) Branch and the New York State Natural Heritage Program prior to the initiation of any action that may affect State- or Federally-listed species or their habitat. The ES offices in New York recommend that the list of species potentially present in each County should be checked every 90 days should management/construction activities be planned that might impact species.

B. Explanation of actions to be implemented to reduce adverse effects:
As explained above, we believe that implementation of the proposed alternative CCP will result in either completely beneficial effects to the listed species described above; or that any direct, indirect, or cumulative adverse effects that may result will be no more than insignificant or discountable. In order to ensure that habitat restoration activities and other management actions in listed species habitat will have no adverse effects, these actions will be performed outside listed species growing/breeding seasonal windows.

VIII. Effect determination and response requested: [* = optional]

A. List species/designated critical habitat:

Determination	Response requested
No effect/No adverse modification **(Species:** Atlantic Hawksbill Sea Turtle, American Eel, Loggerhead Sea Turtle, Atlantic Ridley Sea Turtle, Green Sea Turtle, Leatherback Sea Turtle, Shortnose Sturgeon)	**_*_ Concurrence**
May affect, but is not likely to adversely affect species/adversely modify critical habitat **Species:** 1) Bald eagle (any adverse effects no more than discountable or insignificant) 2) Roseate tern (any effects completely beneficial) 3) Piping Plover (any effects completely beneficial) 4) Sandplain gerardia (any effects completely beneficial)	**_X_ Concurrence**
May affect, and is likely to adversely affect species/adversely modify critical habitat **(Species:_____)**	**____ Formal Consultation**

Signature **Date** August 28, 2006

Refuge Manager
Long Island National Wildlife Refuge Complex

IX. Reviewing ESO Evaluation:

A. Concurrence __X__ Nonconcurrence_____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

Signature **Date** 8/29/06

Appendix I

M. Lin/USFWS

Public meetings and open houses provide a forum for discussing refuge issues with our partners and the general public.

Consultation and Coordination with Others

- Public Involvement Summary
- List of Preparers

Public Involvement Summary

In chapter 2, figure 2-1, we presented the steps in the comprehensive conservation planning process and how it integrates NEPA requirements, including public involvement. This appendix summarizes our coordination and consultation with others in developing this comprehensive conservation plan, including meetings with the public and our conservation partners, mailings, and announcements in the "Federal Register."

Public scoping. In September and October 2000, more than 200 people attended our series of afternoon open houses and evening public meetings in both Nassau and Suffolk counties. We announced their locations, dates and times in local newspapers, on various websites and in special mailings. Local residents, landowners, and various conservation organizations and agencies provided valuable input on refuge management issues of concern.

September 26, 2000	Mastic Beach, New York
September 27, 2000	Brookhaven, New York
September 28, 2000	East Hampton, New York
October 18, 2000	West Sayville, New York
October 19, 2000	Oyster Bay, New York

Newsletters. We mailed a planning newsletter in September 2000 to our mailing list of about 1,500 people, and distributed it at the refuge headquarters at Wertheim and at all of those open houses and public meetings. That newsletter contained a workbook that included questions to help collect ideas, concerns and suggestions from the public on important issues associated with managing the Long Island refuges. We asked for input on those issues and possible action options, the things people valued most about the refuges, their vision for the future of the refuges, and whether our recreational facilities meet public needs. We received more than 100 workbooks in response.

We distributed a second newsletter in January 2001 that summarized the highlights of those responses and what we had gleaned from our public meetings. A third newsletter in February 2003 included the latest news about the Complex and our planning process. We also asked the public to provide input on draft versions of our vision and goals for the refuges. In January 2006 we distributed to over 3,000 people a fourth newsletter that included an update of the process, in particular noting the large turnover in refuge staff personnel, as well as including a brief description of three draft alternatives and how the draft CCP/EA will be made available for review and comment during the spring. In June 2006 we sent out a postcard-sized mailer announcing the availability of the draft CCP/EA and the dates and locations of our public meetings and open houses.

Related planning. During the planning process, part of our continuing refuge management included addressing important issues as they arose. Refuge staff completed two environmental assessments independently of that process: One addressed the issue of deer hunting at the Wertheim refuge; the other addressed development of a headquarters and visitor center at Wertheim.

Each EA included extensive public involvement, and incorporated our comprehensive conservation planning: how the CCP would integrate the proposed action; and, how implementing it would impact the CCP.

In February 2001, Mamie Parker, then regional director, approved an EA for a visitor center/staff office on a 6-acre site adjacent to Wertheim. That EA analyzes four alternatives. Eighty-four percent of the written responses supported that center. The responses that did not support it primarily were based on perceived affects on property values, safety issues, and apparent misunderstandings about trail access. We held a public hearing about the proposed facility in December 2000.

In 2004, we completed an EA evaluating four management alternatives to address overpopulation of white-tailed deer at Wertheim, including a controlled public hunt, and held public meetings in June 2004. Public hearings attracted about 100 refuge neighbors, conservation and sportsmen's groups and avid hunters. Less than a handful of people opposed a controlled public hunt. The majority favored it.

As part of the CCP process we initiated intra-service consultation with our Ecological Service's program to evaluate potential impacts of our proposed management to threatened or endangered species. An intra-service section 7 biological evaluation form was completed for this final CCP and is included as an appendix.

"Federal Register" Notices. We published our original Notice of Intent (NOI) in the "Federal Register" on May 30, 2000, stating we would develop an Environmental Impact Statement (EIS) for the Complex in conjunction with its CCP. Then, as we evaluated two of the primary issues in their own environmental assessments independently of the CCP process (see above), we determined that an EA rather than an EIS would be more appropriate to accompany this CCP. On March 28, 2005, our second NOI in the "Federal Register" advised the public we were withdrawing the previous notice and, instead of completing a CCP/EIS, would complete a CCP/EA. In preparing this draft CCP/EA, we considered all comments we had received after publishing the first NOI.

Workshops. The rationale of our workshops was to generate a range of possible solutions that would address issues of resource management and public use at the Complex. In February 2001 and January 2002, we held workshops with various biological and public use experts from federal, state, local and non-profit organizations. Those workshops allowed us to work closely with our partners in discussing the vision, goals, objectives, strategies, and consequences at the heart of this plan.

We used the input obtained from our public meetings, newsletters and workshops to prepare a draft CCP/EA, which was released on June 19, 2006 for 30 days of public review and comment. During that period, we held three public meetings.

June 26, 2006	Shirley, New York
June 27, 2006	Oyster Bay, New York
June 28, 2006	Sag Harbor, New York

We analyzed all of the comments on the draft CCP/EA we received during its 30 day public review and applied them when we revised it into our final CCP. Appendix J summarizes those public comments and our responses to them.

Each year, we will evaluate our accomplishments on the refuge in accordance with the preferred action described in this final CCP. We may intensify refuge monitoring without additional NEPA compliance. However, any results of our future monitoring that predict a new, significant impact would require our analysis and public involvement in an additional environmental assessment.

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Kayakers enjoying the Carmans River at Wertheim refuge.

Appendix J

Summary and Response to Public Comments

- Introduction
- Hunting and Fishing
- Managing Threatened and Endangered Species
- Furbearer Management/Trapping
- Invasive/Nuisance Species Control
- Outreach
- Oyster Bay
- Infrastructure
- Miscellaneous Comments

Introduction

We reviewed and considered all letters received during the public comment period for the Long Island National Wildlife Refuge Complex Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA). The Draft CCP/EA was originally released for 30 days of public review from June 19 through July 19, 2006. Based on the analysis in the Draft CCP/EA, and our review of public comments, the Service has selected a Preferred Alternative. The Preferred Alternative basically includes all of Alternative B, the Service-Proposed Action in the Draft CCP/EA, with a few modifications described in the discussion below. We will also issue a Finding of No Significant Impact (FONSI). The FONSI establishes that our decision will not significantly affect the quality of the human environment and does not require preparation of an Environmental Impact Statement.

We received numerous responses by way of oral testimony at public hearings or through submission of written or electronic documents. Comments were received from local and State agencies, conservation and recreation organizations, and local residents.

Twenty-five people attended our public meeting on June 26, 2006, from 7:00 p.m. to 9:00 p.m., at Dowling College (Brookhaven Campus), Shirley, New York. Fourteen people attended the public meeting on June 27, 2006, at Doubleday Babcock Senior Center, Oyster Bay, NY, and five people at Morton NWR, Sag Harbor, NY, on June 28, 2006.

The following discussion summarizes the substantive issues they raised and our responses to them. Many of our responses refer to the full text copy of our draft CCP/EA, and indicate how the final CCP reflects our proposed changes. If you would like to view or download copies of the draft CCP/EA or final CCP, they are available online at *http://library.fws.gov/ccps.htm* or *http://longislandrefuges.fws.gov*. You may also request them on CD-ROM or in print by contacting the refuge headquarters.

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Hunting and Fishing

Comment: There was a wide range of opinions regarding hunting, i.e. those opposed to all forms of hunting and those receptive to some hunting.

We follow with the range of comments:

- Expand hunting opportunity (3)
- In favor of deer hunting (3)
- In favor of goose hunting (2)
- Expand deer hunting opportunity (1)
- Use hunting for management purposes only (1)
- No hunting (3)
- No hunting on Wertheim (2)
- No deer hunting
- No deer hunting on Wertheim (2)
- No youth archery hunting (1)
- Hunting is inhumane (1)
- Expand fishing opportunity (2)

Response: The Service recognizes that in many cases, hunting is an important tool for wildlife management. Hunting gives resource managers a valuable tool to control populations of some species that might otherwise exceed the carrying capacity of their habitat and threaten the well-being of other wildlife species, and in some instances, that of human health and safety. Furthermore, the National Wildlife Refuge System has a long history of support by recreational hunters, including the creation of over 300 units through the use of Migratory Bird Conservation Act of 1919 (16 U.S.C. 715a-715r) using "Duck Stamp" funds. This traditional support has been recognized in subsequent statutory authority for the System, including most recently the National Wildlife Refuge System Improvement Act of 1997. This law, which also provides the System its mission, clearly states that six wildlife-dependent recreational uses, including both hunting and fishing as well as wildlife observation and photography and environmental education and interpretation, when compatible, are the priority general public uses of the System. Furthermore, these uses are to receive "enhanced consideration over other general public uses in planning and management within the System …." The Improvement Act also directs the Service to provide "increased opportunities for families to experience compatible wildlife-dependent recreation, particularly opportunities for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting …." From this statutory language, Congress' intent is clear that the Service provide opportunities for hunting and fishing where it is compatible with the purposes for which the refuge was established. The refuge has weighed the impacts to: 1) fish and wildlife resources and their habitats, 2) other priority public use, and 3) adjacent land use such as residences, commercial property, and open space. We have determined that any negative impacts associated with the proposed hunting would not be significant.

The Improvement Act did not establish a hierarchy among the six uses, but enables refuge managers to facilitate them when they are compatible and appropriate. Therefore, hunting and fishing may be given equal consideration with non-consumptive recreational uses. Appendix C includes our compatibility determinations for the resident Canada goose and white-tailed deer hunts.

Provisions governing hunting and fishing on national wildlife refuges are in the Code of Federal Regulations (50 CFR part 32). We regulate hunting and fishing on refuges to: ensure compatibility with refuge purpose(s); properly manage the fish and wildlife resource(s); protect other refuge values; ensure refuge visitor safety; and provide opportunities for quality recreational and educational experiences. On many refuges where we decide to allow hunting and fishing, our general policy of adopting regulations identical to State hunting and fishing regulations is adequate in meeting these objectives. On other refuges, we must supplement State regulations with more-restrictive Federal regulations to ensure that we meet our management responsibilities and to provide an enhanced degree of safety for both the general public and the hunters. We issue refuge-specific hunting and sport fishing regulations when we open wildlife refuges to migratory game bird hunting, upland game hunting, big game hunting, or sport fishing.

We develop specific management plans for each refuge prior to opening it to hunting or fishing. In many cases, we develop refuge-specific regulations to ensure the compatibility of the programs with the purposes for which we established the refuge and the mission of the System, as well as safety and administrative concerns. These regulations list the wildlife species that you may hunt or those species subject to sport fishing, seasons, bag limits, methods of hunting or fishing, descriptions of areas open to hunting or fishing, and other provisions as appropriate. During annual reviews, we consider public/hunter safety, conflicts with wildlife/habitat management goals, cost, staffing, enforcement, conflicts with other priority recreational uses; and additional/changes to refuge specific regulations.

Comment: Several reviewers suggested we consider an alternative to a public deer hunt for population management, i.e. shooting conducted directly by refuge staff instead of the hunting public.

Response: Should the deer population continue to increase, the refuge may consider additional means of population control beyond a public hunt. Control by refuge staff or contracted sharpshooters would increase the potential of selectively harvesting animals to correct the age/sex ratios of the herd. The opportunity to reduce reproductive potential by increasing the percent of females harvested would likely be greater than under a regulated public hunt.

From a public safety standpoint, this alternative carries a greater potential reduction in safety hazards to individual members of the hunting public, as only refuge staff/contractors will be involved in deer control activities. However, this alternative carries the likelihood of objections from the public to take by refuge staff. It would result in a loss in opportunity for a priority public recreational use as defined in the Refuge Improvement Act. Local deer hunters are likely to be concerned because this alternative precludes potential deer hunting opportunities. This alternative is contrary to Service policy to conduct a reduction of surplus

game animals using a recreational hunt, when it can be used to effectively manage wildlife populations.

Comment: Two reviewers suggested that the use of GonaCon™ (GnRH), a contraceptive agent for deer, should be considered instead of hunting as the means of deer population control.

Response: Population management, alone, is not the only justification for opening the refuge to limited deer hunting. As stated above, hunting is one of the priority public uses established by the Improvement Act.

In addition, the following information was extracted from a US Department of Agriculture (USDA), Wildlife Services website. USDA is the lead Federal agency involved in immunocontraceptive development for wildlife population control. USDA indicates the efficacy of GnRH depends upon the individual animal and its response to the vaccine. GnRH has successfully kept female deer infertile for 2 to 4 years in pen studies. Because it is a single-shot, multiyear vaccine, GnRH may be a practical management tool. Deer need to be injected only once to become infertile for up to 4 years. The vaccine can be used in urban and residential areas, where other management methods, such as hunting, are not an option. However, currently GnRH must be injected into the muscle or tissue of each animal. Eventually, WS scientists hope to produce an oral GnRH vaccine bait that will be attractive to deer but not other animals. The vaccine itself only costs $2–$10 per dose. The main cost of using GnRH is associated with the time and money required to capture and vaccinate the deer. The estimated cost of vaccinating a deer ranges from $500 to $1,000 if capture and marking are required. If marking individual deer is not required and groups of animals can be vaccinated by remote delivery of the injections, costs would be much lower per treatment. However, the USDA states that contraception alone cannot reduce overabundant deer populations to healthy levels. GnRH is a tool to be used in conjunction with other wildlife management methods.

Comment: Left on their own, deer populations would realize a natural cycle of high-low populations, as the food resources within the habitat vary with the population.

Response: The ability for a deer population to self-regulate is based upon the deer's biological carrying capacity (BCC) for a given area. The BCC of a wildlife population is defined as the maximum number of animals that an area can support without degradation to the animal's health and the environment over an extended period of time. When this number is exceeded, the health of the population begins to suffer, reproduction declines, parasitism and disease increase, and habitat quality and diversity decrease due to overbrowsing of plant species preferred as food by deer (Kroll et. al. 1986). Overbrowsing negatively impacts the habitat and landscape, and overall animal health declines, due to less nutritious food items being available. Damage and conflicts currently occur, therefore it is reasonable to conclude that if deer were allowed to self-regulate to the point that they would reach their BCC, deer damage and conflicts would not cease but likely occur at higher rates.

The cultural carrying capacity (CCC) is defined as the maximum density of a given species that can coexist compatibly with the local human population (Decker and Purdy 1988). This term is useful because it defines when conflicts with deer have exceeded an acceptable level, and provides managers with a target for establishing management objectives. Certain factors may influence the CCC, such as landscape or vegetation impacts, threats to public safety, the potential for illegal killing of deer, and personal attitudes and values. The threshold of wildlife damage acceptance is the primary limiting factor in determining the CCC. Generally, the CCC is reached before BCC.

Comment: Hunting accelerates the proliferation of animals, including deer. Also, hunting has not proven effective in controlling deer populations because populations depend on many factors.

Response: White-tailed deer do not exhibit self-regulatory mechanisms whereby compensatory reproduction (increased production of fawns) occurs following population reductions (accomplished through shooting, hunting, or other mechanisms) when free-ranging population is well below BBC (Keith 1974, Wagner et. al. 1995). Alternately, compensatory reproduction may have occurred elsewhere in the past where fenced/closed deer populations occurred at or above BCC, and where population control measures were taken. Simply put, a population of healthy animals generally has a higher birth rate than a population of unhealthy animals. Reducing an unhealthy herd to an optimal number that is in ecological balance with the available habitat will likely result in a higher birth rate amongst the individuals that remain. In the absence of historical/natural controls over the deer population, e.g. large predators, humans will have to remove a sufficient number of animals annually to maintain population health and stability.

Deer hunting is regulated statewide and is a valuable management tool to assist in maintaining a healthy productive heard. Depending upon the local circumstances, hunting may be used to reduce damage and conflicts at a local level. This type of management approach has been shown to reduce damage and conflicts on a localized basis (Kirkpatrick et. al. 2002). The success or failure of hunting in managing deer populations can be quite variable dependent upon the location that it is used, the hunting methods available, the skills of the hunter, and other deer management strategies being used in the area. While sport hunting is not appropriate for all situations, it is the primary management strategy used by land management agencies when determined practical and effective for a given situation.

Comment: Deer and wildlife impact on an environment is different than irreversible damage and destruction. Trees that have browse lines are not subject to being destroyed.

Response: The statement is generally correct when considering the impact of deer browse on individual mature trees. However, deer can have a profound impact on vegetation, altering species composition to the point that entire forests either fail to regenerate, or regenerate with trees and understory species that are not beneficial to deer or other species of wildlife, or for lumber (Waller and Alverson 1997). Deer browsing damages and destroys landscaping and ornamental trees, shrubs, and flowers. As rural areas are developed, deer habitat may actually be

enhanced because fertilized lawns, gardens, and landscape plants serve as high quality sources of food (Swihart et. al. 1995). Furthermore, deer are prolific, and adaptable, characteristics that allow them to exploit and prosper in most suitable habitat near urban areas, including residential areas (Jones and Witham 1990). The succulent nature of many ornament landscape plants, coupled with high nutrient contents from fertilizers, offers an attractive food source for deer.

Deer overabundance can effect native vegetation and natural ecosystems in addition to ornamental landscape plantings. White-tailed deer selectively forage on vegetation (Strole and Anderson 1992), and thus can have substantial impacts on certain herbaceous and woody species and on overall plant community structure (Waller and Alverson 1997). These changes can lead to adverse impacts on other wildlife species, which depend on these plants for food and shelter. Numerous studies have shown that over browsing by deer can decrease tree reproduction, understory vegetation, vertical structure, density, and plant diversity (Warren 1991). By one count, 98 species of threatened and endangered plants, many of them orchids and lilies, are disturbed by deer browsing (Ness 2003). In the Great Smokey Mountains National Park, Tennessee, an area heavily populated by deer had a reduction in the number of plant species, a loss of hardwood species and a predominance of conifer species compared to an ecologically similar control area with fewer deer (Bratton 1979). In a single park in Columbus, Ohio, a deer herd eradicated more than 150 plant species (Ness 2003).

The alteration and degradation of habitat from over-browsing by deer may displace other wildlife communities (e.g., neotropical migrant songbirds and small mammals) that depend upon the understory vegetative habitat destroyed by deer browsing (VDGIF 1999). Similarly, De Calesta (1997) reported that deer browsing affected vegetation that songbirds need for foraging surfaces, escape cover, and nesting. Species richness and abundance of intermediate canopy nesting songbirds was reduced in areas with higher deer densities (DeCalesta 1997). Intermediate canopy nesters declined 37% in abundance and 27% in species diversity at higher deer densities. Five species of birds were found to disappear at densities of 38.1 deer per square mile and another two disappeared at 63.7 deer per square mile. Casey and Hein (1983) found that 3 species of birds were lost in a research preserve stocked with high densities of ungulates and that the densities of several other species were lower than in an adjacent area with lower deer density. Waller and Alverson (1997) hypothesize that by competing with squirrels and other fruit-eating animals for oak mast, deer may further affect many species of animals and insects.

Comment: "I have contracted lyme disease in 2001, 2003, 2004 and now in 2006. The deer population is out of control with its habitat and is spreading the lyme disease. I strongly recommend that the herd be controlled by a hunt ..."

Response: A popular belief is that a high deer population density correlates directly with high deer tick densities, and consequently high incidence of lyme disease transmission to the human population.

Our limited search of the literature reveals that white-tailed deer typically serve as the host of the adult stage of the deer tick. The presence of deer is therefore required for the tick to complete its lifecycle. Adult ticks overwinter in the leaf

litter after dropping off the deer (Fish 1993). Therefore, distribution of ticks across the landscape is largely determined by the distribution of deer in the fall (Ostfeld et. al. 1996). However, it has been determined that minimal deer population densities are necessary to maintain a relatively high population of ticks. We therefore would not expect to reduce the number of ticks appreciably by reducing the number of deer.

Though adult ticks are quite capable of transmitting the disease to humans, deer are not considered the reservoir for the lyme bacterium. It is believed that most lyme disease in humans is contracted from the bite of infected nymph stage of the tick (Ostfeld et. al. 1996). The larval and nymph stages of the tick are not host specific and will feed upon a wide range of vertebrate species. The white-footed mouse is the primary reservoir/carrier of the bacterium. The tick picks up the bacterium from the reservoir species and may transmit the bacterium to the next animal that it bites.

Most potential larval/nymph hosts, i.e. mammals, birds and reptiles, are unlikely to become infected with lyme (Lane et al. 1991; Anderson & Magnarelli 1993; Mather 1993; Ostfeld & Keesing 2000a), thus many ticks never become infected with Lyme because some hosts exhibit low reservoir competence (Ostfeld and Keesing 2000a). The white-footed mouse has the highest reservoir competence (LoGiudice et. al. 2002); defined as the ability of the host to become infected, maintain the infection, and transmit the infection to the vector/tick. Studies have found that high densities of mice correlate well with high incidence of infected ticks. These studies also show an increased diversity of vertebrate host species in the environment reduces the likelihood that a tick will feed on an individual with a high reservoir competence. This “dilution effect” reduces the density of infected ticks, hence reduced potential for tick-human transmission of lyme (Ostfeld and Keesing 2000a; Ostfeld and Keesing 2000b; LoGiudice et. al. 2002).

White-footed mice are found in the highest densities in relatively small, fragmented woodlands. Small woodlands are typified by reduced diversity of plant and animal species generally, as well as those species that would compete with, or prey directly on, mice (Nupp and Swihart 1998). Larger woodlands (>2 ha) have been found to have reduced incidence of lyme infected ticks (Nupp and Swihart 1998; Krohne and Hoch 1999; Allan et. al. 2003).

In most suburban environments, humans have fragmented the landscape into parcels where ticks and white-footed mice may thrive. Deer may survive very well within this environment, and where their populations have increased, they have altered the ecological balance on the landscape. Through herbivory and spread of invasive plants, deer have contributed to alteration/loss of biodiversity. Diverse assemblages of plants support a wider variety of animal species. Studies show that as small vertebrate diversity increases, the incidence of lyme carrying ticks decreases (Allan et. al.; Buskirk and Ostfeld 1995; LoGiudice et. al. 2002). Refuge objectives outline reduction in the density of the deer herd to restore biological, including vertebrate, diversity. It is possible that reducing the deer herd may increase vertebrate species diversity, potentially reducing the incidence of lyme transmission to humans.

Comment: Some reviewers wished to expand the refuge hunt program to include additional species and refuges (e.g., Oyster Bay, Seatuck, and Morton), while others voiced opposition.

- Open turkey hunting (if/when State opens season) (1)
- No duck hunting (3)
- Expand waterfowl hunting opportunity (1)

Response: Opening the refuge at this time to hunting for additional species, beyond those discussed in this CCP (i.e. white-tailed deer and resident Canada goose at Wertheim), is beyond the scope of this document.

Section 2-54 states, "Within 5 years, work with partners to evaluate the feasibility of a limited duck hunt at Wertheim." This statement indicates future consideration and evaluation of a duck hunt, only. A formal proposal to open the refuge to hunting for ducks or turkey in the future will require initiation of a new NEPA review and Compatibility Determination. If proposed, there will be additional opportunity for public review and comment.

Comment: Two reviewers indicated that hunting should be used for management purposes only. Justifying opening a waterfowl hunt strictly on the basis of the refuge's desire to conform to the mandate for enhancing a priority wildlife-dependent recreational activity would be considered a mistake at Wertheim. The opinion of the reviewer was that most neighbors do not object to a resident goose and deer hunt but allowing a general waterfowl hunt will destroy the neighborly friendship that has been fostered locally by the refuge staff and Friends of Wertheim.

Response: Population management, alone, is not the only justification for opening the refuge to a public hunt. As stated above, hunting is one of the priority public uses established by the Improvement Act. Additionally, hunting has been a traditional form of recreation along the Carmans River corridor for generations. Prior to acquisition by the Service, the Wertheim family hunted waterfowl and deer along the lower reaches of the Carmans River. Waterfowl hunting continues today north of the Wertheim refuge in Southaven County Park and south of the refuge in the Great South Bay. Under Service policy, hunting is an acceptable and traditional form of recreation, particularly in areas where those lands have historically supported hunting. Hunting opportunities may be modified on refuge lands for various reasons, including wildlife population considerations, the presence of Federally- or State-listed species, habitat maintenance, safety considerations, maintenance of a high-quality hunting experience, or in rare instances, protection of a research population.

Comment: Several reviewers were worried about safety issues arising from hunting in the relatively congested landscape on Long Island, and hunting skills of inexperienced youth hunters.

Response: Safety is our paramount consideration in developing this hunting program. Hunters must abide by all state and federal safety regulations related to hunting near roads and dwellings. New York State hunting regulations make it

illegal to discharge a hunting weapon so that its load, shot or arrow, passes over any part of a public highway (any road maintained by state, county, or town) or within 500 feet of any dwelling, farm building, or structure in occupation or use.

All new hunters (regardless of age) must pass a New York State Hunter Education course, and an additional Bow Hunter Education course is needed to hunt big game with a bow. A Junior Archery license is for 14-15 year olds to hunt big game, such as deer, and only with bow and arrow. While hunting, all junior bow hunters are required by law to be accompanied by a parent, or adult over 18 with written permission of parent/legal guardian (who also must have current hunting privileges and at least one year's experience). Hunters must be at least 16 years old to hunt big game with a gun. Hunting by persons under the age of 16 is highly regulated in New York State. A more descriptive term for the junior hunting and junior bow hunting licenses would be learner's permits, because hunters under the age of 16 are permitted to hunt only under adult supervision. This legal requirement for licensed adults to take responsibility for the safety of minors seems to be the key to the extraordinary safety record of junior hunters. These restrictions are listed on the NYSDEC Web site at *http://www.dec.state.ny.us/website/dfwmr/license/lichuntres.html*.

On Long Island, the regular hunting season runs October 1 through December 31, and is restricted to archery hunting only. There is a special season open for shotgun in parts of Suffolk County (including Wertheim), for about 3 weeks in January.

Comment: Proposed actions could result in a decrease in habitat quality and be detrimental to fish and wildlife populations. These actions include: 1) increasing amount of trails; 2) locating visitor center in quality wildlife habitat; 3) increasing public shoreline fishing access points; and 4) increasing hunting opportunities for some waterfowl species. Another commenter pointed out that hunting disturbs bird habitat more than walking or biking.

Response: The mission of the Refuge System clearly speaks to the challenge of balancing the needs of wildlife with the interests of the American people. A major challenge in managing and protecting wildlife refuges lies in managing *people*, or more specifically managing their behavior through both direct and indirect approaches. Wildlife and people *can* coexist together through the use of education, interpretation, permitting, activity prohibitions, and enforcement of regulations.

One way of balancing the needs of wildlife and people is by permitting and encouraging wildlife-dependent public uses. Wildlife-dependent recreation is a priority public use of the Refuge System and, as such, is facilitated whenever it is found to be compatible with the purposes and management of the refuge. Attempts to minimize human impacts on refuge lands and wildlife are sometimes carried out through the use of signs and by the presence of refuge law enforcement officers. Visitor impacts are also lessened by limiting public access to certain designated area of a refuge; by containing visitors through the use of trails, boardwalks, and carefully placed ditches and vegetative plantings; by limiting and consolidating visitor use; and by imposing seasonal or permanent closures of certain sensitive areas. The use of observation platforms, mounted view scopes, and even auto tour routes can serve to provide visitors with a unique wildlife experience

while permitting the larger expanse of refuge lands to remain untouched and undisturbed.

There are some who will argue that any form of public use will create a certain level of disturbance to wildlife, and therefore should not be permitted, especially on a "refuge." Others, however, will make the case that direct exposure to wildlife and refuge lands will promote public awareness and appreciation and will foster conservation stewardship and long-term support for natural resources.

Comment: Hunting does not provide an economic benefit to an area. Another comment noted that national tax dollars should not contribute to hunting on refuges.

Response: Findings published in, *Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation* reveal recreational visits to National Wildlife Refuges generates substantial economic activity. In Fiscal Year 2004, more than 36.7 million people visited refuges for recreation. Their spending generated $1.37 billion of sales in regional economies. As this spending flowed through the economy, nearly 24,000 people were employed and $453.9 million in employment income was generated. About 68 percent of total expenditures are generated by non-consumptive activities on refuges. Fishing accounted for 27 percent and hunting 5 percent of total expenditures. As noted earlier, the Improvement Act clearly states that six wildlife-dependent recreational uses, including hunting, are the priority general public uses of the System.

Comment: One respondent cites text from appendix C-23, Resident Canada goose hunting compatibility determination that indicates, "the principle impacts likely would be the disruption of feeding patterns and the displacement from roost or feeding sites…" of federal and state listed species.

Response: Potential impacts to federally listed species are carefully considered by the USFWS Endangered Species office. Additionally, the State of New York must submit a letter approving the opening of the hunt. Potential impacts are evaluated and Refuge Specific Regulations may be imposed to reduce disturbance or incidental mortality of non-target species.

The resident Canada goose hunt is being implemented, in part, as a widely accepted management tool to limit the increase of a particular species. The hunt is restricted to a period of approximately 3 weeks in September, before a significant number of migratory Canada geese arrive.

Comment: Several reviewers questioned the use of the phrase "inviolate sanctuary" and its appropriate application to refuge purposes and objectives. These reviewers appear to understand the phrase inviolate sanctuary to mean closed to entry and therefore closed to hunting.

Response: The Migratory Bird Conservation Act of 1929, as amended (MBCA), defines the term "inviolate sanctuaries" where take of birds was prohibited. Subsequent amendments to the Duck Stamp Act and the Administration Act authorized the Secretary to allow hunting in these areas up to certain limits.

If a refuge, or portion thereof, has been designated, acquired, reserved, or set apart as an inviolate sanctuary, we may only allow hunting of migratory game birds on no more than 40 percent of that refuge, or portion, at any one time unless we find that taking of any such species in more than 40 percent of such area would be beneficial to the species (16 U.S.C. 668dd(d)(1)(A), National Wildlife Refuge System Administration Act; 16 U.S.C. 703-712, Migratory Bird Treaty Act; and 16 U.S.C. 715a-715r, Migratory Bird Conservation Act). Generally, Regional Directors have the authority to change the number of acres open to hunting. However, before we can open more than 40 percent of an inviolate sanctuary to hunting, we must consider the reasons for doing so, and we must publish these reasons in the *Federal Register*. Because of this requirement, the Director, under delegation from the Secretary, must approve all proposals to open more than 40 percent of an inviolate sanctuary to migratory bird hunting. Refuge managers must carefully evaluate all such proposals to ensure the proposed action will be compatible. Inviolate sanctuary classification imposes no limits on hunting non-migratory birds or other game species.

Comment: Hunting should not be permitted simply because it is a refuge. The fact that this refuge is located in one of the most densely populated regions of the country makes it all the more important that the habitat be free of any pressure from human population.

Response: We agree that human encroachment and disturbance are major concerns for all involved in conservation, preservation and restoration of rapidly shrinking ecosystems. There are areas on Refuges where limiting human interference is a primary management objective, especially when impacts to a threatened or endangered species are possible. However, mandates outlined elsewhere in this document clearly describe our role in wildlife/habitat management and facilitating public uses deemed compatible with refuge purposes.

Comment: Page 2-17 stating that Wertheim is the only unit sizeable enough for deer hunting is contrary to statements made elsewhere about exploring the feasibility of a public hunting opportunity at Seatuck (Page 2-52) and conducting deer management activities at Seatuck, Morton and Conscience Point. The CCP should be rewritten to reflect that due to the size of Wertheim, it is the easiest unit to implement a hunt on or something similar.

Response: We have considered the option of a public archery deer hunt at Seatuck. Utilizing New York regulations and guidelines of a 500' buffer zone, we estimate approximately 18 acres of deer habitat would be available for hunting. This estimate excludes salt marsh and grassland areas where archery deer hunting is not practicable. During the deer cull, we could fit 3 shooters in the safe zone and those three shooters have restricted zones of fire to ensure public safety. For these reasons and the relatively high costs associated with implementing public hunting for a small number of people, Seatuck may not be a feasible public hunting option. Other deer management activities (besides a public hunt) can still be considered at Seatuck, Morton and Conscience Point should overabundant deer become a problem. The CCP will reflect that due to its overabundant deer population and size, that Wertheim offers the best opportunity for a public deer hunt on the Complex

Managing Threatened and Endangered Species

Comment: Page 2-50 incorrectly designates mud turtles as a Species of Special Concern. They are State Endangered.

Response: We corrected the CCP to note the mud turtle status as "State Endangered."

Comment: Since 2003, NYSDEC have been monitoring nesting piping plover on the sound side of the wetland at Frost Creek (near Oyster Bay NWR), and at Center Island and Stehli Beach. NYSDEC and the refuge should coordinate together.

Response: We agree. We updated the CCP to address piping plover at Oyster Bay (in addition to Morton, Target Rock and Amagansett NWRs).

Furbearer Management/ Trapping

Comment: Several reviewers would like to see the refuge offer a general trapping program. They are concerned about the increasing populations of mammals such as fox, raccoon, and coyote, and they believe development and restrictions on public access increasingly limit opportunities for trapping.

Response: Trapping furbearers is not one of the six priority public uses. In addition, the refuge manager does not want to divert limited staffing and funding to administer this program, but plans to focus those resources on the six priority public uses. However, we may use furbearer management as an administrative tool, when needed, to protect federal trust resources of conservation concern, such as nesting migratory birds. The refuge manager will determine when conditions on the refuge warrant administrative trapping.

Comment: In general, from a wildlife management standpoint, I support all your proposed alternatives. Anything that expands monitoring, increases management capacity, and increases awareness of the importance of managing habitats for the benefit of wildlife is worthwhile. The role that hunting and trapping can play in managing habitat should be highlighted. With plover management at Morton, the electric fencing and enhanced stewardship proposal are great. It seems odd not to include management actions directed at the reason why electric fencing is necessary in the first place though. Predator management is important not only from an endangered species perspective, but with the advent of rabies on Long Island, it may also become important from a human disease vector perspective. USFWS preaches predator control to NGOs and private landowners to increase endangered species productivity and survival, so it seems logical to expect similar action on USFWS-managed properties with similar issues.

Response: On page 2-28 of the draft CCP/EA we stated the following strategy: "Assess red fox, raccoon, Norway rat, crow and gull populations at each refuge, and develop a predator management plan in collaboration with USDA Wildlife Services." We will continue to work with our partners, including NYSDEC, to address predator management on the Complex.

Invasive/ Nuisance Species Control

Comment: Removing mute swans by lethal and/or non-lethal means should be done by refuge staff only. Another commenter noted "I object to killing swans."

Response: If necessary, mute swan control measures will be conducted by authorized refuge personnel. Service policy on maintaining biological integrity, diversity, and environmental health of the System clearly states, "unless we determine that a species was present in the area of the refuge under historic conditions, we will not introduce or maintain the presence of that species..."

Even though they provide some aesthetic value for public enjoyment, mute swans are highly invasive of wetland habitats, impact native species of fish and wildlife, damage commercial agricultural crops, and pose a threat to human health and safety. As such, they cause serious nuisance problems and property damage, including economic loss. Because of their consumption of large quantities of submerged aquatic vegetation and their aggressive behavior, mute swan compete directly with many other water birds and fisheries for critical habitats. Due to their strong territorial defense, some pairs will vigorously defend nest and brood sites from intrusion by other wildlife and have attacked humans, causing serious harm. Adult mute swans will only be controlled when/if habitat degradation occurs or swan numbers become excessive.

Comment: "I feel the way it (Open Marsh Water Management - OMWM) is being monitored and evaluated at Wertheim is the only way we will be able to find what works and what doesn't. Plus it is being done on a small scale – the pilot OMWM study at Wertheim has not 'dug up and ruined' all of the marshes. The less spraying that has to be done for mosquitoes the better off we will all be."

Response: Comment noted; we agree.

Comment: A reviewer requested that guidelines for mosquito spraying on the refuge be clearly spelled out in the final CCP.

Response: A Mosquito Management Compatibility Determination is included in Appendix C of both the draft CCP/EA and final CCP.

Comment: Wertheim refuge has been trying to control Phragmites for years; various techniques have been experimented with but the reviewer has never seen published results.

Response: The Refuge has controlled Phragmites within the Big Fish Creek impoundment and in the upper tidal reaches of Little Neck Run and Yaphank Creek. Phragmites control programs have been developed in numerous salt marshes along the Atlantic seaboard. The Refuge has consulted with land managers and reviewed published literature to help us design our program. The Service monitors the effects of the Phragmites control projects, through ocular estimates, photo points, and the development of GIS maps of Phragmites stands. Because there is a considerable amount of information on Phragmites control available, the Refuge has not engaged in a detailed scientific research study. In the future, if promising control techniques are developed, the Refuge may consider participating in research projects to evaluate these new techniques.

Comment: There should be more written on the negative impacts of overabundant Canada geese. As I recall, there was considerable trouble with re-establishing plantings in the restoration areas at Wertheim due to browsing by resident geese. The issue with resident geese is very similar to your deer management priority in this regard (removal of overabundant species to promote regeneration of native cover types and hence greater biodiversity of trust species).

Response: We agree. Two important factors in the overgrazing of the restoration plantings were the small size of the planted areas and the low fencing used to exclude geese. At the nearby Beaver Dam Creek planting, fencing has successfully prevented overgrazing by geese in the areas planted in 2005 and 2006.

Outreach

Comment: "Friends of Wertheim has been very fortunate because we have had the support of refuge staff and the Northeast Region from day one."

Response: Thank you. The Friends are an invaluable asset and partner in providing assistance and promoting refuge/Service goals.

Comment: Referring to the refuge's endeavor's to improve existing or develop new partnerships with groups involved in or influencing public use and resource conservation activities on and off the refuges, Stony Brook University is purchasing Southampton College from LI University and will continue their Marine Life program. Their combined program could make an excellent partnership/program with the refuge.

Response: We agree.

Comment: One reviewer requested greater mention of the Central Pine Barrens and their various councils and commissions that address land and habitat preservation, law enforcement, and invasive species within the text to signify the combined awareness and intention to preserve and manage this sensitive area. Furthermore, the reviewer suggested the plan address non-Service initiatives to designate and preserve habitat and open space with the Central Pine Barrens, and explore future partnerships.

Response: We agree. The text of the CCP has been revised to better reflect the contributions and features of the Central Pine Barrens.

Comment: Develop a train the trainer program so that STPS hike leaders can educate hike participants on the local flora and fauna on refuge trails.

Response: Long Island National Wildlife Refuge Complex staff welcomes the opportunity to assist the STPS and other interested organized group leaders in their educational and interpretive efforts while utilizing Complex lands. Train the trainer programs, written educational and interpretive materials, and audio-visual products are all possible methods of assistance.

Oyster Bay

Comment: A reviewer requested more information regarding potential strategies and impacts of shellfishing and dredging operations in Oyster Bay. Another reviewer encourages the Service to ensure that commercial shellfishing remain viable and sustainable, as the industry provides has been active to preserve the water quality in the bay.

Response: The specific purpose of the Oyster Bay National Wildlife Refuge as established by the Migratory Bird Conservation Act is "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." When the Town of Oyster Bay conveyed to the United States of America, the lands below the mean high water line in Oyster Bay, Cold Spring Harbor, and Mill Neck Creek, the deed included the same purpose for the Refuge. The deed also included "…as a nature preserve for the scientific, educational and aesthetic purposes and in order to preserve its natural beauty both for this generation and for future generations, and that said premises shall be kept and maintained entirely in their natural state and operated for the aforementioned purposes only, without any disturbance whatever of habitat or plant or animal populations and undisturbed by any activities that might adversely affect the flora or fauna, their natural habitat, or which would impair the essential natural character of the premises." As a result of the deed, the Town of Oyster Bay retained certain rights regarding the regulation of shellfishing. The Service is working with partners such as NYSDEC, Friends of the Bay, National Oceanographic and Atmospheric Administration/Fisheries, and our Ecological Services program to protect and maintain water quality, improve the quality of aquatic and wetland habitats, and assess the impacts of any activities in the Refuge that may degrade habitat or adversely affect fish and wildlife populations. The Service has also begun developing a Habitat Management Plan for the refuge which will contain step-down plans for projects such as monitoring fish and wildlife populations and habitats, and mapping and controlling invasive species.

In regards to dredging operations, any dredging operation within the Refuge boundary will require a Compatibility Determination and a Special Use Permit, in addition to other State and Federal permits. The Refuge staff will assess the impacts associated with each individual project proposal, consult with other natural resource agencies and interested partners, and make a determination as to whether the project will significantly impact fish and wildlife resources or their habitats. In the event that a significant negative impact is likely, the Refuge will work with our partners and the applicant to avoid, minimize or mitigate the impacts as necessary.

Comment: Two reviewers encourage the Service to increase public awareness of the refuge at Oyster Bay, and to weigh in on local threats to the refuge. A staffed office would be an excellent way of increasing the agency's presence and would have an immediate positive effect on protecting the resources. Increasing visibility through new and additional signage would also be helpful.

Response: The Service is very much interested in working with partners, including the Friends of the Bay and the Waterfront Center, to improve our presence and visibility at Oyster Bay. Exploration of a shared, staffed office is one of the strategies we hope to accomplish.

Comment: Establish a "water trail" around the bay for kayaks and canoes. This basically entails creating a map of access points, routes and points of interest, and making it available to the public. Improvements to access points, rest areas etc. could be made in cooperation with the surrounding municipalities that own many of these areas.

Response: The Complex agrees that a water trail for kayaks/canoes as a means of supporting wildlife-oriented recreation (fishing, wildlife observation, wildlife photography, interpretation and environmental education) as well as improving access and points of interest at Oyster Bay is an excellent idea. The Complex will explore partnerships to expand and improve Oyster Bay National Wildlife Refuge's wildlife-oriented recreational opportunities as resources allow.

Comment: Extend the existing 5mph zone from 200 feet from shore to at least 500 feet from shore. This would make the bay safer and more desirable for low impact uses such as kayaking, canoeing and rowing, would help protect the shoreline from the erosion created by boat wakes, and would protect shorebirds and wildlife from motor traffic, all without prohibiting motor boats from using the bay. Make the Mill Neck Bay area that runs north and south from the Bayville strip to Beaver Dam a no motor zone (electric only). This area is only accessible to motorboats at high water anyway and would provide a refuge for wildlife from the noise and turbulence of boat traffic, especially on summer weekends, when the rest of the bay becomes a free for all.

Response: Safety and resource protection is of paramount concern to the Service in providing access for boating and other public uses of Oyster Bay National Wildlife Refuge. Based on a preliminary assessment, we feel that the 200 foot "No Wake Zone" provides boats without motors ample area of safe passage. However we will work with the U.S. Coast Guard (under Title 33 and Title 46), the State Department of Environmental Conservation and local authorities to evaluate the need for additional control measures in Oyster Bay, including the Mill Neck Bay area, and make any necessary changes.

Comment: Help provide support and funding to acquire environmentally sensitive parcels of land connected to the Refuge such as the Mill Neck Bay Marina.

Response: As stated in the draft CCP/EA under "Actions Common To All Alternatives," the refuge noted that in terms of 'and acquisition, we will continue to acquire refuge inholdings within approved refuge boundaries as willing sellers become available. The refuge will also continue to consider minor acquisitions adjacent to existing refuges that are biologically important or provide connections with other protected lands of our conservation partners. The parcel of land known as the Mill Neck Bay Marina would fall into the category of being adjacent to the refuge, and the tract of land would be biologically important for the refuge to acquire. Although the refuge does not currently own the property, our office along with staff from the U. S. Fish and Wildlife Service Ecological Services office, continually review and monitor projects that occur within the Mill Neck Bay Marina area to ensure compliance with environmental laws and regulations. As new projects arise at the marina, we will work with the marina owners to utilize methods that cause the least amount of wildlife and land disturbance, and to minimize potential impacts to refuge property.

Comment: Encourage the surrounding municipalities to enter into an inter-municipal agreement to create an entity whose sole responsibility would be to protect and enhance the integrity of Oyster Bay Harbor and enforce all legislation that affects the integrity of the estuary on a watershed basis and makes recommendations to the municipalities on maintaining controls in place (i.e. street sweeping, siltation basin maintenance, repairs to roadway drainage washouts etc.). Another reviewer suggested more thought go into not duplicating the efforts of the TR Sanctuary and the Friends of the Bay.

Response: The CCP discusses the Service's plan to improve communication and coordination with partners such Friends of the Bay, National Oceanographic and Atmospheric Administration/Fisheries, and the NYSDEC. We also consult with our Ecological Services Branch and the Coastal Program on specific projects that may impact the Refuge either directly or indirectly. As resources allow, we would be willing to develop memorandums of understanding with the various interested partners and municipalities with regard to various activities that may impact the Refuge. As stated above, activities proposed within the Refuge boundary will require a Compatibility Determination and a Special Use Permit, and may require other State and Federal permits. Personnel within the various agencies are likely to have expertise in different areas and the Refuge staff will seek their input. In the event that a significant negative impact is likely, the Refuge will work with our partners and the applicant to avoid, minimize or mitigate the impacts as necessary.

***Comment*:** Oyster Bay NWR does not meet criteria set for a waterfowl refuge – no activity that disturbs wildlife should be present. Original agreement was that activities traditionally present at time of refuge's conception would continue. A group of influence prevailed upon the Department of Interior to exclude the traditional activity of waterfowl hunting.

Response: The Town of Oyster Bay donated 2,400 acres to the Service in 1968 as a habitat for migratory birds, particularly wintering waterfowl, under authority of the Migratory Bird Conservation Act - it has since expanded to over 3,200 acres. The donation included deed restrictions for mineral rights and shell fishing leases. The refuge is mainly open water, and provides public uses such as fishing, crabbing, oystering, and recreational boating. An activity that disturbs wildlife can be allowed, as long as the use is determined to be compatible (i.e., does not materially interfere with or detract from the mission of the Refuge System, or the purposes for which the refuge was established). Waterfowl hunting occurred on the refuge until 1991, when the use was determined to be illegal as the Service never officially opened the area to hunting in accordance with the rulemaking requirements of the Administrative Procedures Act (5 U.S.C. 553).

Infrastructure

Comment: Extend the existing trail at Elizabeth A. Morton NWR to the end of Jessup's Neck. Allow access for viewing the daffodils during peak bloom.

Response: Protecting the threatened piping plover is a high priority legislated mandate. Accessing the area in question will result in disturbance to vital nesting and brood rearing habitats. Access to the area will remain closed during the breeding season.

Comment: Create a handicapped accessible trail within Conscience Point NWR. Southhampton Trails Preservation Society (STPS) offers their assistance to facilitate this project.

Response: Opening and adding trails at Conscience Point NWR will be carefully considered. We must first detail, inventory and map the sensitive habitats and species currently present before we can determine the appropriateness and compatibility of opening the refuge and adding trails. The Service understands the public's desire to be able to view plants and wildlife in representative natural landscapes. Therefore, the Complex plans on exploring partnerships with adjacent landowners to provide access to closed units, where access may involve our providing interpretive information kiosks and observation areas on properties adjacent to the refuge.

Comment: Some reviewers support acquisition and use of the South Haven School on the Montauk Highway as the refuge visitor center and office facility.

Response: The Service's preferred alternative features constructing a new facility on refuge property at the location specified in the CCP. The new permanent headquarters/visitor center will be constructed using an authorized standard design (medium model). The Service remains interested in seeing the school property protected, as it features habitat that can provide for wildlife. The Service did make an earlier attempt to acquire the school property for use as a headquarters/visitor center, but this effort could not be completed. We are concerned that rehabilitation costs for the school facility would be high, will not provide the administrative or public facilities needed, and will not be as cost effective (including operational costs) of a newer and more energy-efficient facility. If new information that addresses Service concerns becomes available at a later date, the Service will consider the information as part of the future decision-making process.

Comment: Some reviewers commented that they would prefer the existing refuge office not be demolished once the new building is completed.

Response: No decision has been made on the future of the existing office building, although the Service is interested in re-establishing habitat along the west side of the Carmans River once the new facility is built.

Comment: A reviewer had concerns regarding the refuge's unstated interim plan to use the observation field on the White Oak trail for offices and housing.

Response: The interim plan to address the immediate needs for a safe working and living environment for refuge staff is mentioned in the draft CCP/EA on pages

2-9, 2-10, and 2-56. The refuge will work with the Friends of Wertheim to further explain details of the interim plan to the public in upcoming newsletters.

Miscellaneous Comments

Comment: One reviewer had concerns regarding the human health effects of particulate matter as a byproduct of prescribed burning.

Response: Refuge fire management activities are subject to and must comply with all applicable Federal, State, and local air pollution control requirements as specified by Section 118 of the Clean Air Act, as amended 1990. Any planned activity requires a permit from the NYSDEC Air Pollution Division through the State Forest Rangers.

Comment: "Your bibliography is ancient and obsolete. How can you plan for the future when you use material from 40 years ago?"

Response: We used a sizable listing of citations, much of which came from peer-reviewed journals. Data collected and conclusions drawn by the authors are not made invalid simply because of its age.

Comment: "It seems that decisions are made by each staff, and when staff changes plans change. I hope the CCP/EA will help to change that."

Response: As stated on page 1-3 of the draft CCP/EA, the plan will provide strategic management direction over the next 15 years, and provide long-term continuity. However, the plan does allow the refuge manager some flexibility to respond to changing conditions on and around the refuges of the complex, and features adaptive management strategies to utilize with constantly evolving budgets, staff and issues.

Comment: One respondent believes there was inadequate notice given to the wide range of refuge constituents, particularly animal protection groups.

Response: Our public involvement process is described on pages 1-19, 1-20, and Chapter 5, of the draft CCP/EA. Scoping activities were begun in September 2000 with news releases, paid advertisements, and announcements through our mailing list. A number of non-governmental organizations, including animal protection groups, are regularly notified of our Service CCP efforts.

Comment: What (water-based) uses (at Oyster Bay NWR) would be impacted by Alternative B?

Response: Current uses at Oyster Bay NWR would continue as noted in the CCP. The Service would clarify the criteria for legal private structures and the refuge's authority and responsibility over them. The Service would like to complete the removal of illegal docks. We would work with the Town of Oyster Bay to address the number of boat moorings and fee structure and make any necessary changes. As a result of the deed for the refuge, the Town of Oyster Bay retains certain authority for regulating uses such as shellfishing. We would ensure that refuge

policies are consistent with the intent of the deed. New future uses proposed within the refuge would require a Compatibility Determination and a Special Use Permit, and may require other State and Federal permits. We would explore partnerships to provide new opportunities for wildlife-oriented recreation, and would coordinate with local partners to develop interpretive exhibits and programs. The Service would make every effort to inform user groups/stakeholders of potential changes in policies and provide an opportunity for their input prior to implementation.

Comment: What impact will climate change have on management of the refuge (e.g., sea level rise)?

Response: Sea level rise is both a global and a complex issue, and likely goes beyond the scope of this document. There is probably not enough specific information at this point regarding sea level rise to make sound biological decisions or changing refuge management. The Long Island Complex CCP is a 15-year planning document. At this point, the effects of climate change are likely negligible over the 15 year expected cycle of the plan. As new issues come up, we will address them at that time.

Nevertheless, climate change currently threatens vital coastal marshes, where salt marsh accretion processes may not always keep pace with projected increases in sea level rise. This can lead to marshes becoming too flooded resulting in extensive plant mortality, peat erosion and loss of elevation. If erosion is significant the marsh may be converted to open water or mudflat.

In other instances where salt marshes accrete at the same pace as sea level rise but where there are not adjacent low lying upland areas marshes may be "squeezed out" between rising sea levels (loss due to flooding) and an inability of marsh vegetation to "jump" steep elevation grades, particularly those posed by seawalls or other shoreline structures. A recent phenomenon, sudden wetland dieback, also is causing a decrease in salt marsh vegetation. The extent, cause and duration of this problem remain unknown.

In addition to salt marshes, the refuge complex supports other coastal habitats including beach, intertidal mudflats, marine open water, tidal river, maritime shrubland, and upland forests. These habitats provide critical buffers to the marsh as well as critical habitat to many aquatic and upland species of conservation concern.

Comment: The FAA property at Sayville should be transferred to the Service as previous legislation dictated.

Response: The Service continues to make the transfer of 101 acres from FAA at the Sayville site to the Service complete.

M. Lin/USFWS

View of the beach at Target Rock refuge.

Appendix K

Finding of No Significant Impact (FONSI)

Finding of No Significant Impact
Long Island National Wildlife Refuge Complex
Comprehensive Conservation Plan

In June 2006, we published the draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) for the Long Island National Wildlife Refuge Complex (Complex). The Complex includes the Amagansett, Conscience Point, Elizabeth A. Morton, Oyster Bay, Seatuck, Target Rock, and Wertheim refuges, the Lido Beach Wildlife Management Area and the Sayville Unit of the Wertheim refuge. That draft evaluates three alternatives for managing the Complex over the next 15 years, and carefully considers their impacts on the environment and their potential contribution to the mission of the National Wildlife Refuge System (NWRS) and refuge purposes and goals. Its appendixes provide additional information supporting the assessment. None of the alternatives proposes that we acquire additional land at this time. A brief overview of each alternative follows.

Alternative A: The Council of Environmental Quality regulations on implementing the National Environmental Policy Act (NEPA) require this "No Action" alternative. It would not change our resource management programs on refuge lands. Partnerships with federal, state, county, town, and non-governmental organizations and volunteers will continue to form the core of management activities. The priorities of the biological program will continue focusing on threatened and endangered species, habitat restoration, and the management of invasive or nuisance species. We will continue to promote white-tailed deer management at Wertheim refuge with a controlled public hunt. Fishing opportunities will remain as they are, but with improvements to the fishing access site at Wertheim. Other priority public use programs will continue—primarily wildlife observation, nature photography, and interpretation. Those will focus on units in the Complex that offer such visitor facilities as parking, nature trails, information kiosks, and restrooms. Selecting this alternative would maintain the status quo in refuge management over the next 15 years. Thus, it provides a baseline for comparing or contrasting the two "action" alternatives.

Alternative B: The draft CCP/EA identifies this alternative as the U.S. Fish and Wildlife Service (Service)-proposed action. Selecting this alternative would increase our protection and management of endangered, threatened or other species of concern, including migratory wildlife. It is designed to expand and improve opportunities for wildlife-dependent recreation, and allow the complex to benefit from its proximity to New York City and urban communities.

Alternative C: Under this alternative, we would implement a stricter approach to managing the Complex and its biological resources with less emphasis on providing visitor services. It is designed to minimize human intrusion or intervention, except when necessary to protect threatened or endangered species, control invasive species, respond to natural disasters, or enforce regulations. It would focus on maintaining such public use infrastructure as nature trails and information kiosks, but would restrict access and the number of public programs offered. Outreach and law enforcement efforts will have to be increased using current staff to communicate the changes in management under this alternative. The Complex will maintain a volunteer program, rely more on partners to help conduct biological inventories and monitoring and organize environmental education and interpretation programs, but limit the use of seasonal employees and interns.

We distributed the draft CCP/EA for a 31-day period of public review and comment from June 19, 2006 through July 19, 2006. We received 29 written responses, plus additional comments at public meetings. Appendix I in the final CCP includes a summary of those comments and our responses to them.

After reviewing the proposed management actions, considering all public comments and our responses to them, I have determined that the analysis in the EA is sufficient to support my findings, described below.

I am selecting draft CCP/EA Alternative B (the Service-proposed action) as the final CCP for implementation, with these clarifications.

1) Safety will be our paramount consideration in further developing the hunting program. Hunters must abide by all state and federal safety regulations related to hunting near roads and dwellings. New York State hunting regulations make it illegal to discharge a hunting weapon so that its load, shot or arrow, passes over any part of a public highway or within 500 feet of any building. We will continue to implement hunts for white-tailed deer, and design the resident Canada goose hunt with the utmost consideration for the safety of refuge hunters, visitors and refuge neighbors. As one example, we will post highly visible signs at the refuge entrance and at strategic locations along the refuge perimeter well before the hunt begins. Youth hunters are required to be accompanied by a New York state licensed adult, and all hunters must participate in a refuge-specific hunter orientation. Each hunt provides a management tool to help control overabundant populations, and also wildlife-dependent recreational opportunities for local sportsmen.

2) The Service's preferred alternative features constructing a new facility on refuge property at the location specified in the CCP. Some reviewers proposed we utilize an abandoned school property adjacent to Wertheim NWR for the new headquarters site. The Service remains interested in seeing the school property protected, as it features habitat that can provide for wildlife. The Service did make an earlier attempt to acquire the school property for use as a headquarters/visitor center, but this effort could not be completed. We are concerned that rehabilitation costs for the school facility would be high, will not provide the administrative or public facilities needed, and will not be as cost effective (including operational costs) of a newer and more energy-efficient facility. If new information that addresses Service concerns becomes available at a later date, the Service will consider the information as part of the future decision-making process.

3) We received comments urging us not to tear down the "hunting lodge" currently used at the refuge office at Wertheim once the new headquarters/visitor center is constructed. No decision has been made on the future of the existing office building, although the Service is interested in re-establishing habitat along the west side of the Carmans River once the new facility is built.

4) Extending and adding trails at Morton NWR and Conscience Point NWR will be carefully considered. We must first detail, inventory and map the archaeological and cultural features, sensitive habitats and species currently present before we can determine the appropriateness and compatibility of new trails on the refuges. Safety will be another important consideration. The Service understands the public's desire to be able to view plants and wildlife in representative natural landscapes, and we will explore ways to be able to facilitate future access.

5) The Service will strive to increase public awareness of the refuge at Oyster Bay. We will work with our partners to explore ideas to enhance the refuge's presence and visibility, and promote a positive effect on protecting the resources.

6) The Compatibility Determination for Maintenance Dredging included in the draft CCP/EA will be withdrawn from the final CCP. The Service instead will evaluate maintenance dredging at Seatuck and Morton refuges to maintain existing navigable waterways on a case-by-case basis, and will issue special use permits if found appropriate and compatible with the purposes for which both refuges were established.

7) Region 5 has recently identified "areas of emphasis" with regards to the six priority wildlife-dependent recreational uses for every refuge. The Long Island NWR Complex has been identified for environmental education and interpretation. Thus, we will further consider this recognition as we implement the strategies of the CCP over the next 15 years.

I have selected Alternative B as modified for several reasons. It helps fulfill the mission of the NWRS; best achieves the refuge purpose, vision, and goals; maintains and, where appropriate, restores the ecological integrity of the refuge; addresses the major issues identified during the planning process; and is consistent with the principles of sound fish and wildlife management.

I find that implementing Alternative B adheres to all legal mandates and Service policies, and will not have a significant impact on the quality of the human environment, in accordance with Section 102(2)(c) of the NEPA. Therefore, I have concluded that an Environmental Impact Statement is not required, and this Finding of No Significant Impact is appropriate and warranted.

Acting

Marvin E. Moriarty
Regional Director
U.S. Fish and Wildlife Service
Hadley, Massachusetts

8-31-06
Date

Acronyms

ABS	Area of Biological Significance
ACJV	Atlantic Coast Joint Venture
BCA	Bird Conservation Area
BCR	Bird conservation region
CATX	Categorical Exclusion
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
CWCS	Comprehensive Wildlife Conservation Strategy
DEC	**(New York State)** Department of Environmental Conservation
DOI	**(U.S.)** Department of the Interior
DOS	**(New York)** Department of State
DU	Ducks Unlimited
EA	Environmental Assessment
EE	Environmental Education
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
FR	Federal Register
FWS	**(U.S.)** Fish & Wildlife Service
GIS	Geographic Information System
GPS	Global Positioning System
HMP	Habitat Management Plan
LE	Law Enforcement
LIFO	Long Island Field Office
LIIPS	Long Island Institute of Professional Studies
LISS	Long Island Sound Study
LPP	Land Protection Plan
MBP	Migratory Bird Program
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NABCI	North American Bird Conservation Initiative
NEPA	National Environmental Policy Act
NWR	National Wildlife Refuge
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NAWMP	North American Waterfowl Management Plan
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NYDOS	New York Department of State
NYFTTA	New York Fishing Tackle Trade Association
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OMWM	Open Marsh Water Management
PIF	Partners in Flight
PILT	Payments in Lieu of Taxes
RM	Refuge Manual
ROD	Record of Decision
SCDHS	Suffolk County Department of Health Services
SUP	Special Use Permit
T&E	Threatened and Endangered
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Area
WUI	Wildland Urban Interface

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September 2006