

## Appendix C



*Open marsh water management areas*  
Suffolk County Vector Control

# Compatibility Determinations

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## 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).

**(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.

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 for public use at its present level, i.e., no more than 100 visitors at any one time on each refuge, would not require significant increases in expenditures for maintenance or visitor services staff (e.g., outdoor recreation planning or law enforcement staff). The staff spends time maintaining kiosks and gates, posting signs, providing information to the public about the uses, conducting visitor surveys, analyzing visitor use patterns, and monitoring the effects of that use on refuge resources. A lead outdoor recreation planner would administer the program. A wildlife biologist, assisted by seasonal interns, would monitor its environmental effects. A park ranger also responsible for law enforcement would provide visitor safety and resource protection.

The costs of accommodating these four priority uses include salaries, maintaining trails and facilities, and purchasing materials and other supplies. We keep open a bathroom 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 for wildlife observation, photography, environmental education, and interpretation at \$9,000 per refuge, or a total of \$27,000, and the cost for law enforcement, resource protection and monitoring at \$20,700. Our collecting approximately \$8,000 in entrance fees at the Morton and Target Rock refuges partly offsets those costs.

### **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.

### **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.

### **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

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 is only a 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.

**Refuge Manager** \_\_\_\_\_

**(Signature and Date)**

**Concurrence:  
Regional Chief** \_\_\_\_\_

**(Signature and Date)**

**Mandatory 15-year re-evaluation date** \_\_\_\_\_

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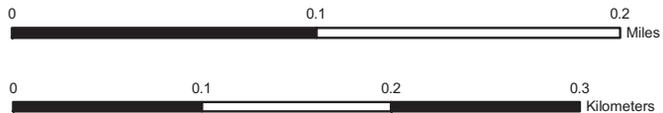
**U.S. Fish & Wildlife Service**  
**Amagansett National Wildlife Refuge**  
Suffolk County, New York



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

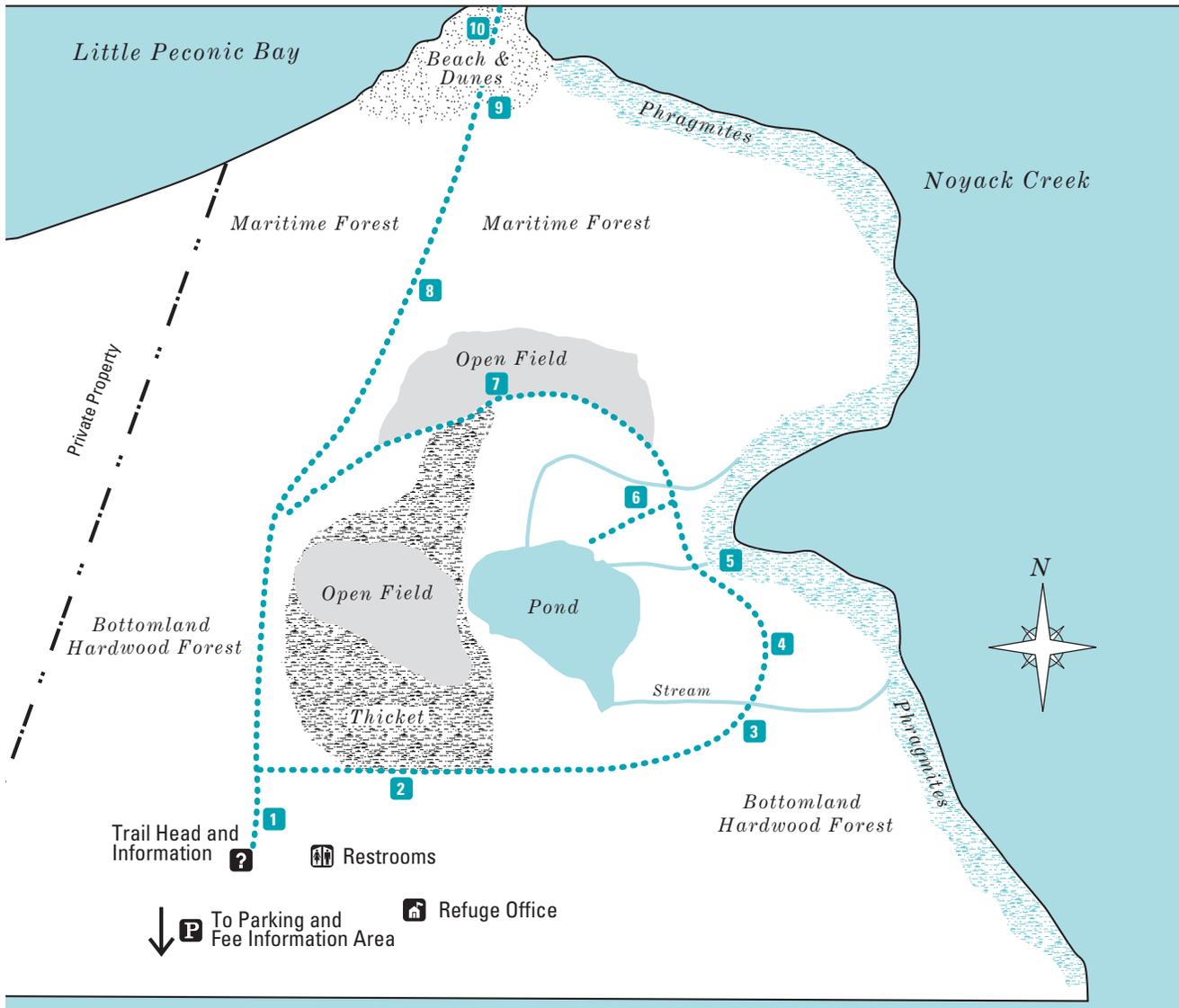


**Figure C-1. Map of the Amagansett refuge**

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.

**Elizabeth A. Morton**  
*National Wildlife Refuge*  
*Wild Birds Nature Trail*

LEGEND	
Refuge Office	Trail Stops
Restrooms	Water
Trail Head and Information	Phragmites
Parking Area	Thicket
Nature Trail	Beach & Dunes



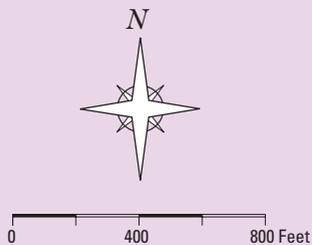
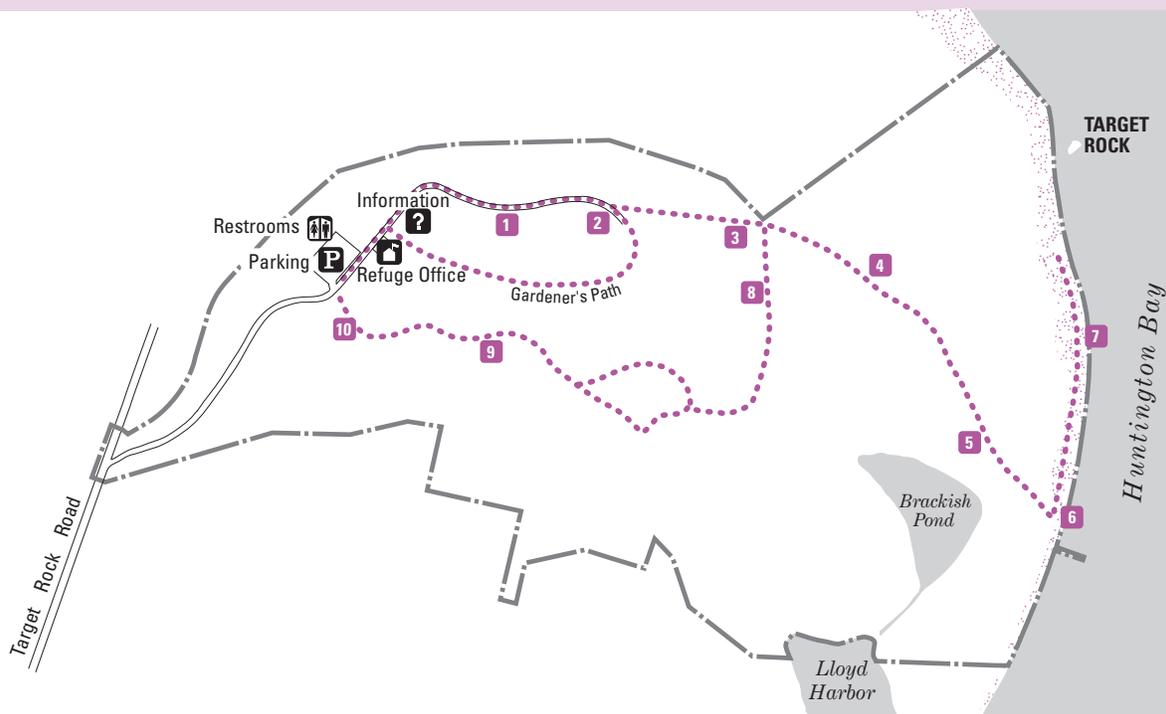
**Figure C-2. Trail map for the Morton refuge**

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.

# Target Rock

*National Wildlife Refuge*

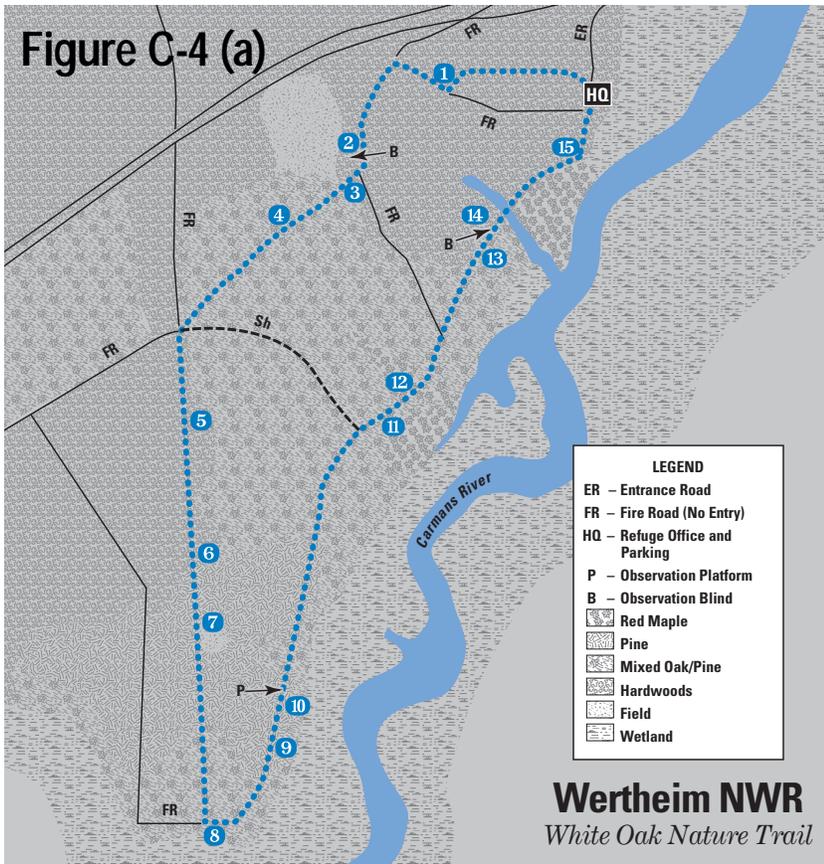
*Warblers' Loop & Rocky Beach Trail*



LEGEND	
	Restrooms
	Information Center
	Refuge Office
	Parking Area
	Refuge Boundary
	Nature Trail
	1 - 10 Trail Stops

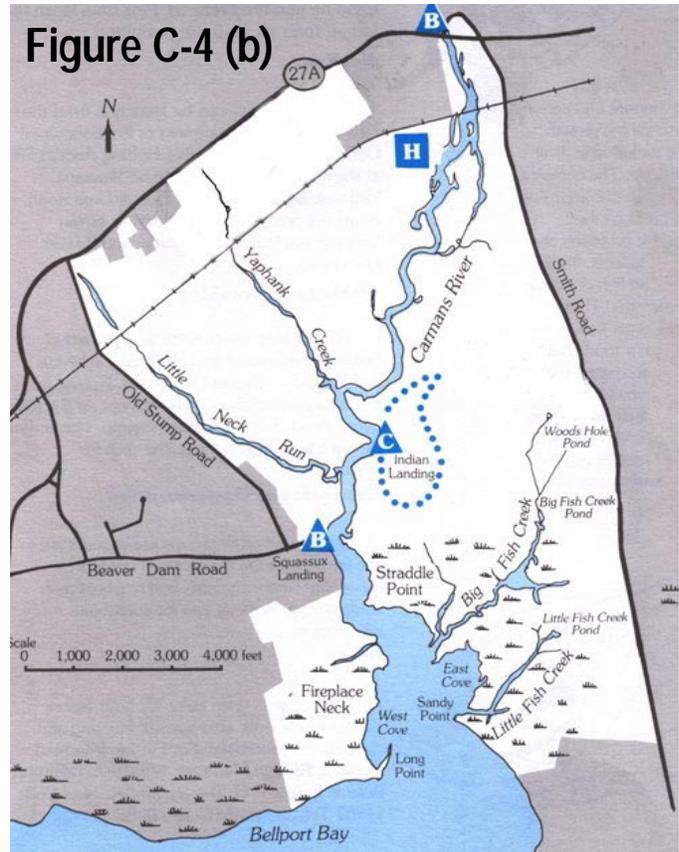
**Figure C-3. Trail map for the Target Rock refuge**

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.

The Service honors 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<sup>2</sup>) 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 (Wolf 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<sup>2</sup>). 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<sup>2</sup>), 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<sup>2</sup> 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<sup>2</sup>.

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<sup>2</sup> density based on 2.5 mi<sup>2</sup> 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<sup>2</sup>. 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<sup>2</sup>, 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	<u>\$1,000</u>
<b>Total</b>	<b>\$8,000</b>

**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
	<b>Total \$24,000</b>

We will assess each hunter a non-transferable, non-refundable, seasonal application fee to 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<sup>±</sup> 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

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.

**Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence:**  
**Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year re-evaluation date** \_\_\_\_\_

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## 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.

The Service honors 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
<b>Total .....</b>	<b>\$3,500</b>

**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
<b>Total .....</b>	<b>\$4,000</b>

**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

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.

**Refuge Manager**

\_\_\_\_\_  
(Signature and Date)

**Concurrence:  
Regional Chief**

\_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year re-evaluation date**

\_\_\_\_\_

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## 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  
 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.

**Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence:**  
**Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year re-evaluation 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, 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  
 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.

**Refuge Manager**

\_\_\_\_\_  
(Signature and Date)

**Concurrence:**

**Regional Chief**

\_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year re-evaluation 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.

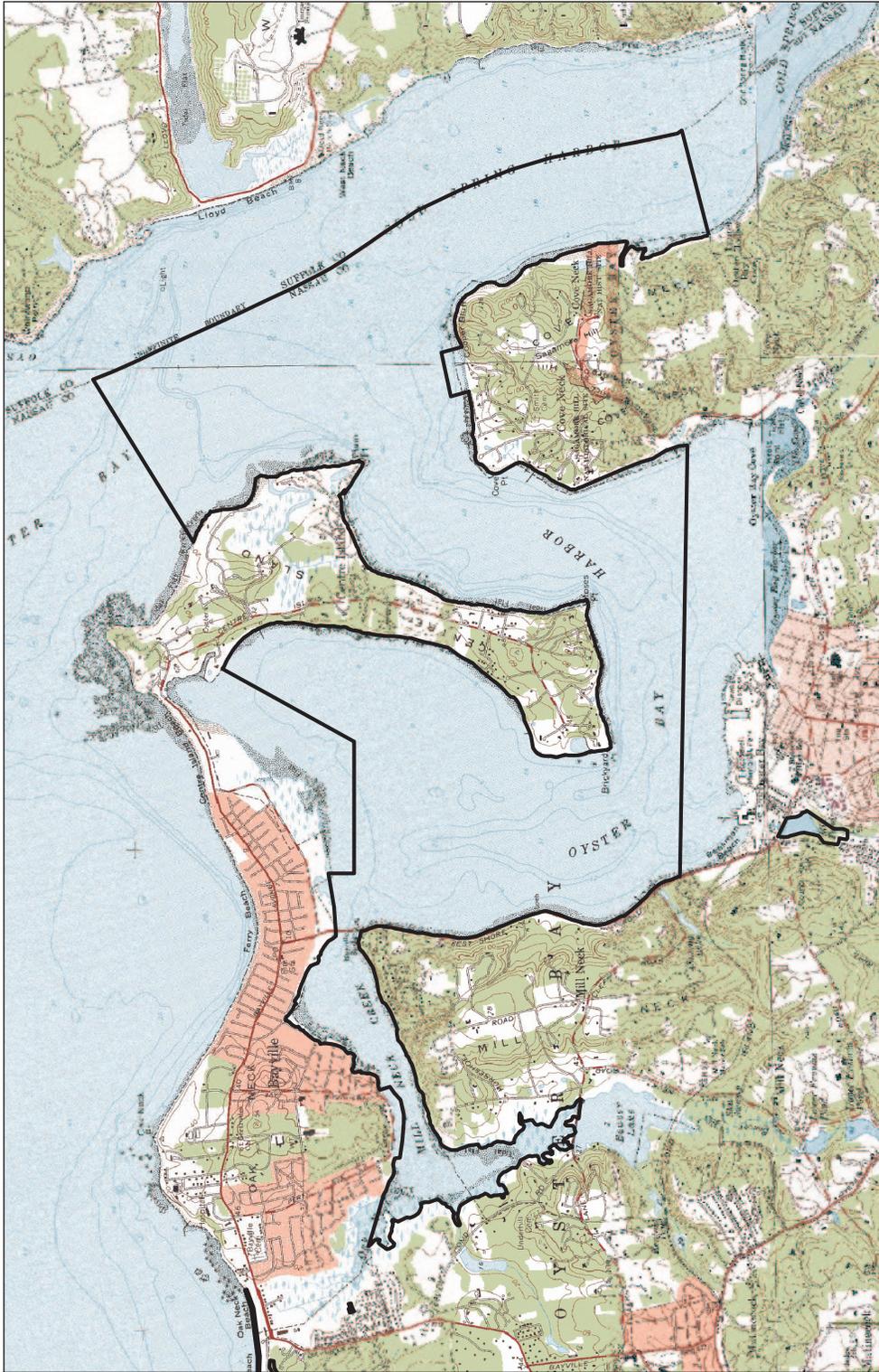
Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin 19:243-248.

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.

**Map C-1**  
Non-Motorized Boating

**U.S. Fish & Wildlife Service**  
**Oyster Bay National Wildlife Refuge**  
Nassau County, New York



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: 4/2006

## 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  
 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.

**Refuge Manager**

\_\_\_\_\_  
(Signature and Date)

**Concurrence:**

**Regional Chief**

\_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year re-evaluation date**

\_\_\_\_\_

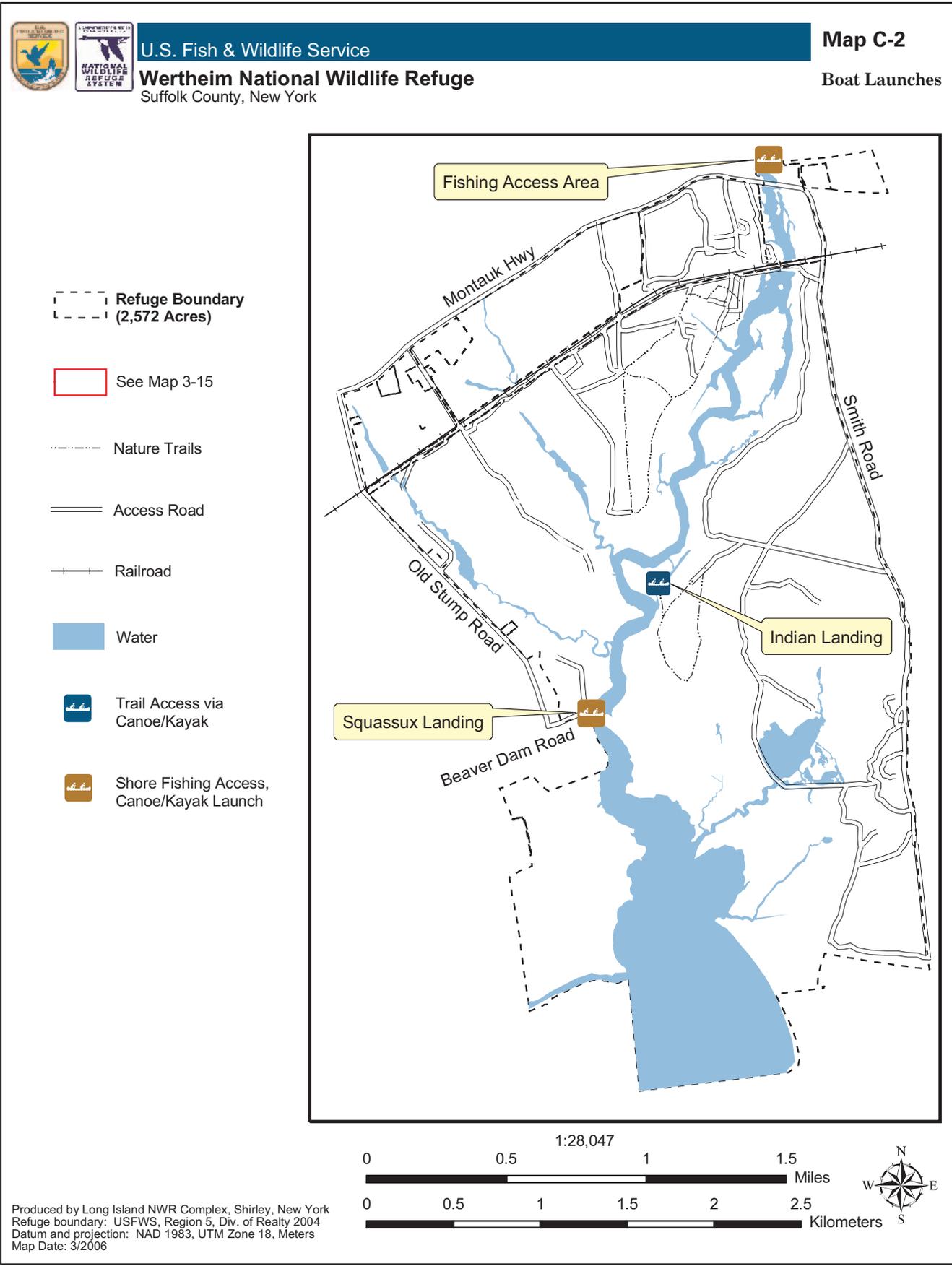
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Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin 19:243-248.

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.



## 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  
 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.

**Refuge Manager**

\_\_\_\_\_  
(Signature and Date)

**Concurrence:  
Regional Chief**

\_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year re-evaluation date** \_\_\_\_\_

**Literature Cited**

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Fausch, K.D. 1989. Do gradient and temperature affect distributions of, and interactions between brook charr (*Salvelinus 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**

The bulk of our cost for research is staff time to review research proposals, coordinate with researchers, write SUPs, and review the results of the research. Some research projects may require only one day of staff time to write a SUP. Others may require weeks of staff time. A senior refuge biologist now spends an average of seven weeks a year working full time on research projects conducted by outside researchers. At an hourly wage of approximately \$30 (for a GS-11), that adds up to about \$8,500 annually for resources spent on outside research.

#### **Anticipated Impacts of the Use**

The disturbance of wildlife and vegetation by researchers could occur through observation, a variety of wildlife capture techniques, banding, or accessing the study area on foot or by vehicle. Direct or indirect mortality could result as a byproduct of research activities. For example, mist-netting or other wildlife capture techniques can cause mortality directly through the capture method or in-trap predation, and indirectly through injury or stress to the organism captured. Overall, however, allowing non-Service personnel to conduct well-designed, properly reviewed research is likely to have very little impact on refuge wildlife populations. If the researchers conduct their projects with professionalism and integrity, the knowledge gained about an entire species, habitat or public use is likely to outweigh potential adverse impacts.

### **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  
 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.

**Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence:**  
**Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year re-evaluation date** \_\_\_\_\_

## Compatibility Determination

### Use

#### Sunbathing on refuge beaches

### 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 the 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
- 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.

**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.

**Refuge Manager**

\_\_\_\_\_  
(Signature and Date)

**Concurrence:**

**Regional Chief**

\_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year re-evaluation 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

#### Maintenance Dredging

### Refuge Name

#### Seatuck National Wildlife Refuge

#### Elizabeth A. Morton National Wildlife Refuge

### Establishing and Acquisition Authorities

The U.S. Fish and Wildlife Service (Service, we, our) acquired Elizabeth A. Morton National Wildlife Refuge as a gift from Elizabeth A. Morton in 1954. The Seatuck National Wildlife Refuge was established on September 26, 1968. The authority for acquiring land at both refuges is the Migratory Bird Conservation Act (16 U.S.C. §715)

### 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 the use? Is it a priority public use?** The use is maintenance dredging on Champlin Creek at Seatuck refuge and on Noyack Creek at Morton refuge by the Suffolk County Department of Public Works, to provide 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. The U.S. Army Corps of Engineers and the New York Department of Environmental Conservation regulate maintenance dredging at both locations. In the past, we have issued special use permits (SUPs) to the Suffolk County Department of Public Works to perform that dredging.

**(b) Where would the use be conducted?** The Seatuck refuge, 193 acres in the Town of Islip, NY, encompasses a variety of habitats: a mix of pine barren habitats, warm season grasslands, tidal wetlands and subtidal habitats. Its wildlife includes waterfowl, shorebirds and wading birds, nesting ospreys, nesting purple martins, white-tailed deer, red foxes and songbirds. The refuge attracts numerous migrating raptors: in particular, northern harriers, sharp-shinned hawks, Cooper's hawks, merlins, kestrels and peregrine falcons. At the Seatuck refuge, approximately 400 feet of Champlin Creek would be dredged, including approximately 150 feet of a shoal that is part of the refuge (see map C-3).

The Morton refuge, 187 acres in the town of Southampton, NY, encompasses a variety of habitats. 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 the last decade, piping plovers have nested at the refuge each year. In 2005, six pairs of piping plovers nested at the refuge, but due to predation and inclement weather, fledged only four young. The least tern colony at the refuge

succeeded in producing 28 fledglings in 2005, down from the 60 fledglings in 2003. Maintenance dredging would occur on Noyack Creek, located between the refuge and Clam Island, to maintain a 100 foot wide navigation channel (see map C-4).

**(c) When would the use be conducted?** At the Seatuck refuge, maintenance dredging would occur between May 1 and December 31, as needed. That typically happens once every few years, most recently in 2005. If ospreys nest within 250 yards of the dredging site, we would allow dredging only between September 1 and December 31.

At the Morton refuge, we would allow maintenance dredging between October 1 and March 31 as needed. That occurs once every few years, most recently in 2004. We will not allow dredging after March 31, to limit the disturbance of nesting and migrating piping plovers and least terns.

**(d) How would the use be conducted?** Refuge staff will evaluate all requests for maintenance dredging before allowing them on the refuge. No dredging project will be allowed if the refuge manager has not issued a 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.

At the Seatuck refuge, the Suffolk County DPW proposes to dredge the mouth of Champlin Creek, with 10 years' maintenance and subsequent beach nourishment. The work would involve dredging, with 10 years' maintenance, of an area approximately 100 feet wide by 300 feet long to a maximum depth of 7 feet below mean low water at the mouth of the creek. The three dredging projects we expect during the proposed 10 year life of the permit will remove approximately 6,000 cubic yards of sand. The Suffolk County DPW will place the dredged materials on the Town of Islip beach located west of the refuge. No spoils will be placed on refuge property. Suffolk County dredged that site in 2005. We do not expect dredging again until 2010 or later.

At the Morton refuge, we periodically have also issued SUPs for dredging to maintain a 100-foot-wide navigation channel at a maximum depth of 7 feet below mean low water in Noyack Creek. Approximately 50 feet of dredging on the refuge removed an accreted sand pit in 2004. The Suffolk County DPW placed the dredged materials in an approved area at the adjoining Clam Island site. We do not expect dredging again until 2007.

**(e) Why is this use being proposed?** Maintenance dredging at Seatuck and Morton refuges would maintain existing, navigable waterways. Although dredging is not a priority public use of the System, Champlin Creek is a navigable waterway adjacent to the Seatuck refuge. Many recreational boaters use it to access the Great South Bay. Recreational anglers and wildlife enthusiasts use Noyack Creek to access the beaches at the Morton refuge. Dredging those channels allows public access to wildlife observation and photography from the waterway at the Seatuck refuge and access to fishing, wildlife observation and photography at the Morton refuge.

#### **Availability of Resources**

We incur most of the cost of maintenance dredging in staff time to review proposals, coordinate with contractors, write SUPs, and visit dredging sites during the projects. Some dredging projects may require only one day of staff time to write a SUP. Others may require weeks of staff time. In years when we issue dredging permits, a senior refuge biologist spends an average of two weeks a year

reviewing dredging proposals and visiting sites. At an hourly wage of approximately \$30 for a GS-11, that adds up to about \$1,200 for each of those years.

### **Anticipated Impacts of the Use**

Dredging the mouth of Champlin Creek will affect the creek's habitats and wildlife resources through the loss of shallow water habitat (Windom 1972). Shallow water habitats provide spawning grounds for some fish species, refuge habitat for fish and invertebrate species, and foraging habitat for wading birds, shorebirds, and dabbling ducks. Bottom sediments will also be lost, with the attendant morbidity and mortality of benthic organisms (Rosenberg 1977; Newell et al. 1998). After the disturbance ends, species may recolonize the substrates, but those species may differ from the previous ones, as the environmental conditions also may differ. Specifically, the new substrate will be at a deeper elevation with more attenuation of overhead light (Oliver, et al. 1977; Quigley and Hall 1999). Dredging will create turbidity, which may adversely affect the biota (Scott and Pine 1975).

The mouth of Champlin Creek remains ice-free long after its upstream portion and the Great South Bay have frozen over. Waterfowl observed in winter in that open area include black duck, gadwall, red-breasted and hooded merganser, widgeon, greater scaup, and bufflehead. Six red-necked grebes, a species uncommon in winter on Long Island, also were documented in that area in February and March 1994. Dredging will not take place in winter, to avoid disturbing wintering waterfowl.

In addition to the impacts on Champlin Creek we described above, Noyack Creek also has a large fiddler crab population, and provides important stopover and foraging habitat for migrating shorebirds. At Noyack Creek, large numbers of waterfowl use the waters around the Morton refuge during migration. As long as our SUPs permit dredging and we closely monitor its impacts, dredging Champlin and Noyack creeks is compatible with the purpose for which both refuges were established.

### **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 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 EIS will offer another opportunity to comment on this compatibility determination.

### **Determination**

Use is not compatible  
 Use is compatible, with the following stipulations

### **Stipulations Necessary to Ensure Compatibility**

We will place seasonal restrictions in effect from April through September at the Morton refuge, to protect nesting piping plovers, least terns, and ospreys.

We will place seasonal restrictions in effect from January to May at the Seatuck refuge, to protect wintering waterfowl. If ospreys nest there, we will permit dredging between September 1 and December 31.

No deposition materials will be allowed on refuge lands, except to nourish the beach directly on the bays, and only after the written permission of the refuge manager.

The dredging site must be staked or marked for the refuge manager’s review and approval at least 5 working days before dredging starts.

The Suffolk County Department of Public Works and any other permittees must notify the refuge manager at least 48 hours before the dredging project will start and 48 hours before it will end.

No equipment for the dredging project will be staged or operated from refuge lands.

Each piece of equipment working on the project site will have spill prevention supplies onboard.

**Justification**

Allowing the beneficial use of maintenance dredging at the Morton and Seatuck refuges under the stipulations above will not materially interfere with or detract from the mission of the System or the purpose for which each refuge was established: “as an inviolate sanctuary, or for any other management purpose, for migratory birds.”

**Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence:**  
**Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year re-evaluation date** \_\_\_\_\_

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Newell, R. C., Seiderer, L. J., and Hitchcock, D. R. 1998. The impact of dredging works in coastal waters: a review of the sensitivity to disturbance and subsequent recovery of biological resources on the seabed. *Oceanogr. and Mar. Biol.: Ann. Rev.* 36: 127-178.

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U.S. Fish & Wildlife Service

**Seatuck National Wildlife Refuge**  
Suffolk County, New York

**Map C-3**

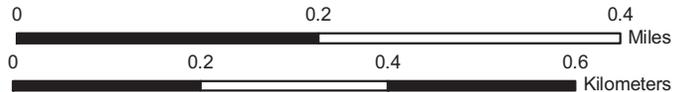
Dredge and Surplus Sites, Champlin Creek, Town of Islip



 **Refuge Boundary**  
**(209 Acres)**

1:7,000

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



**Map C-3. Location of proposed dredging site at Seaturk refuge**

Dredged spoils will be placed on the Town of Islip beach.



U.S. Fish & Wildlife Service  
**Elizabeth A. Morton National Wildlife Refuge**  
 Suffolk County, New York

**Map C-4**

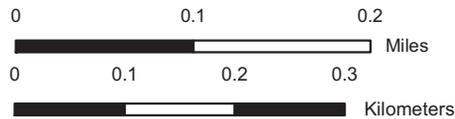
Dredge and Surplus Sites  
 Noyack Creek, Town of Southampton



Refuge Boundary (187 Acres)

1:6,000

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



**Map C-4. Location of proposed dredging site at Morton refuge**  
 Dredged spoils will be placed in an approved location on Clam Island.

## 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 Health 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-5 and C-6), 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**

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 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  
 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.

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 at any time based on future Service policy determinations or scientific studies of the effects of larvicides on the environment or non-target organisms.

**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.

**Refuge Manager** \_\_\_\_\_

(Signature and Date)

**Concurrence:**

**Regional Chief** \_\_\_\_\_

(Signature and Date)

**Mandatory 5-year re-evaluation date** \_\_\_\_\_

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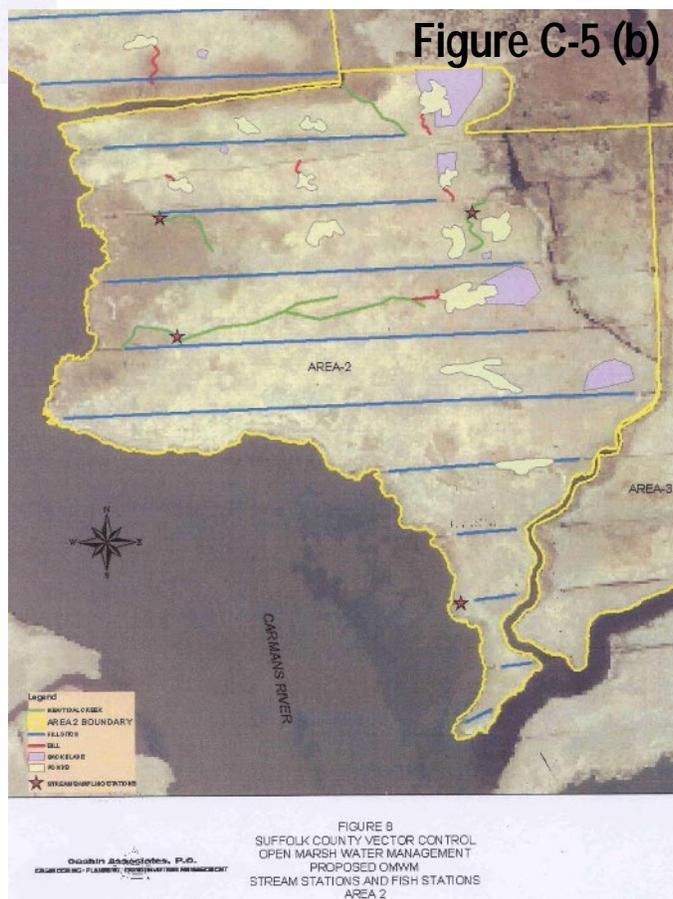
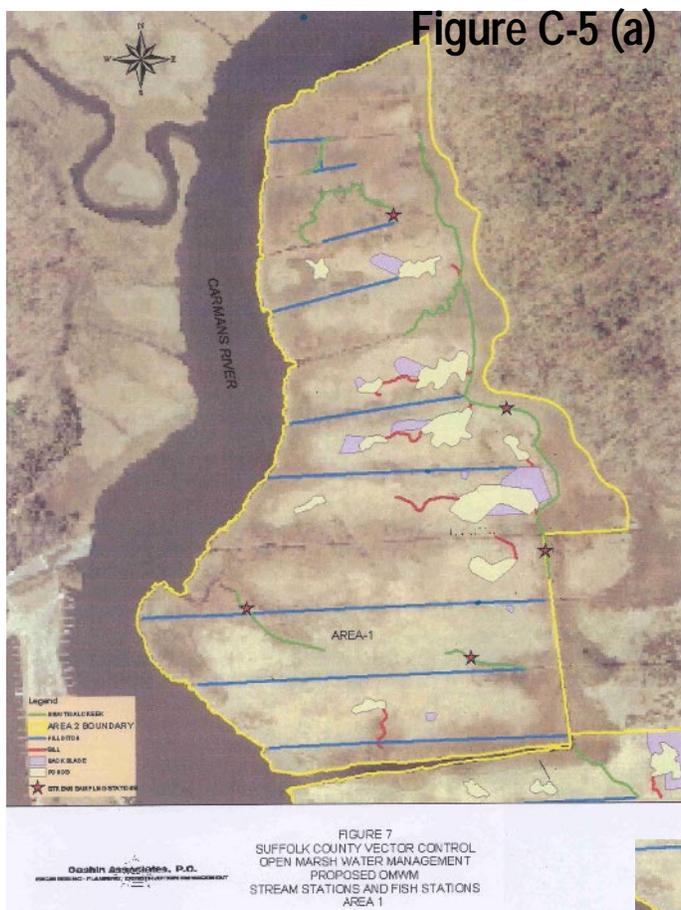
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- U.S. Fish and Wildlife Service. 1992. Station Management Plan — Long Island, NY National Wildlife Refuges. Unpubl. Rept. 64pp.

Table C-1. Wertheim refuge acres treated with larvicides between 1990 and 2005.

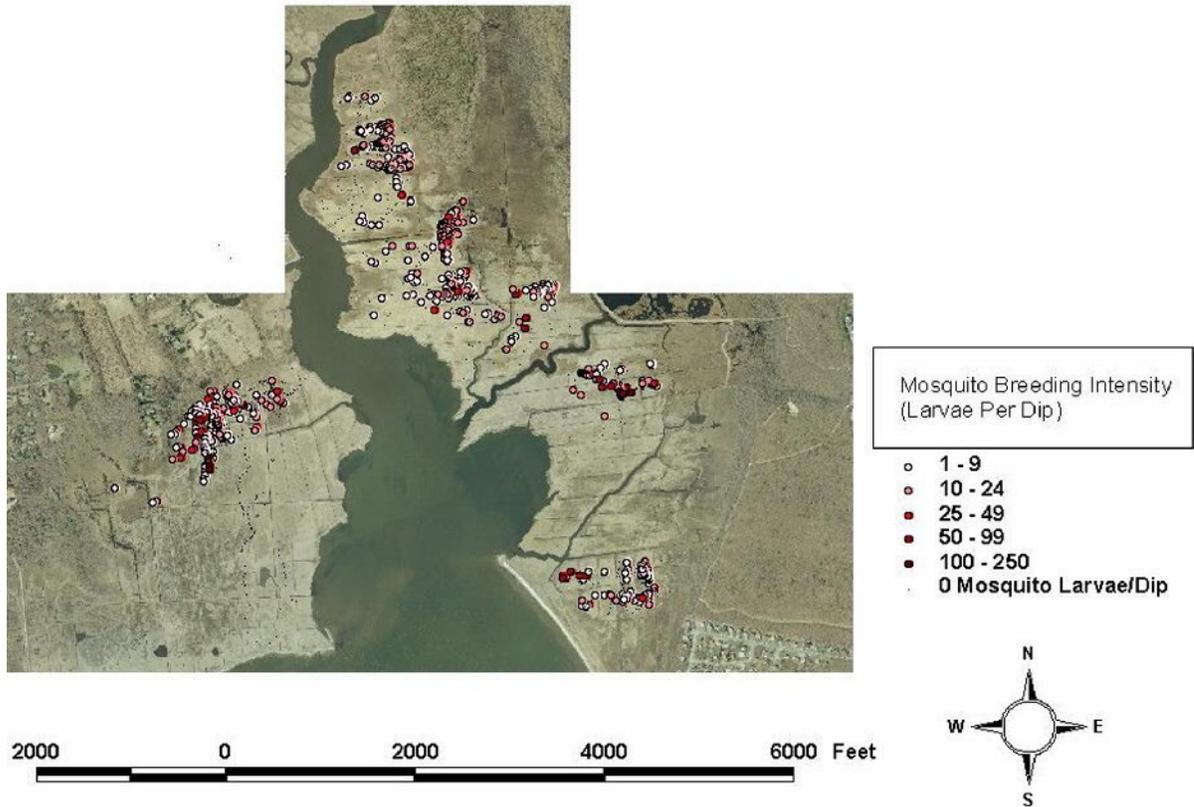
Year of Treatment	Pesticide Used	Pounds of Ingredients	Number of Acres Treated	Number of Treatments
1990	VectoBac (CG)	30,000 lbs of AI/acre	3000	12 applications
1991	VectoBac(CG)	14,900 lbs of AI/acre	2250	9 applications
1992	VectoBac (CG)	6,000 lbs of AI/acre	1750	7 applications
1993	VectoBac (CG)	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.

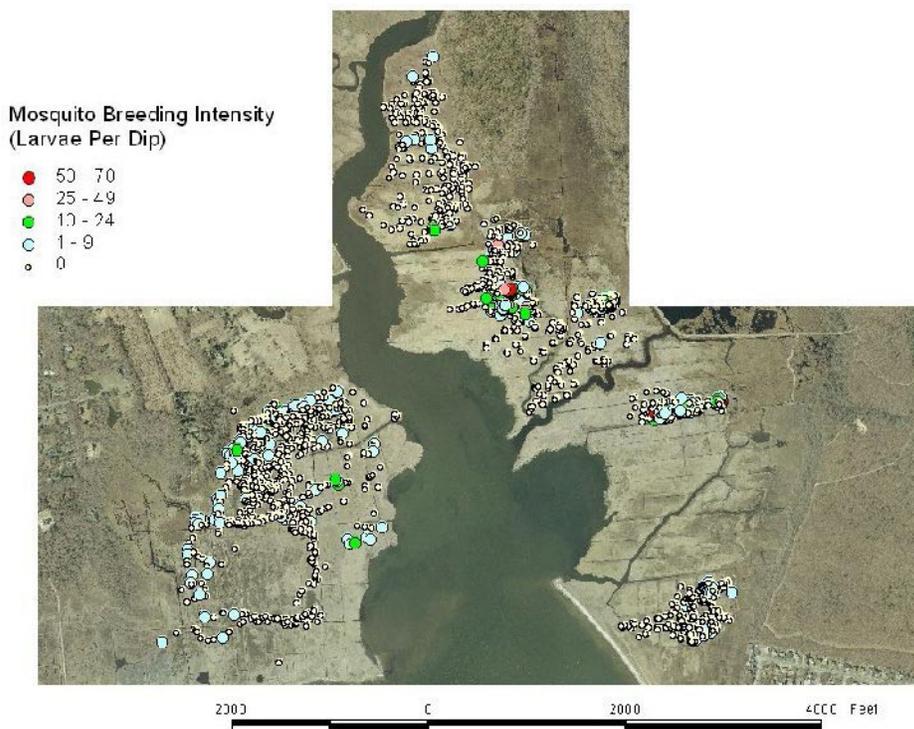
Year of Treatment	Pesticide Used	Pounds of Ingredients	Number of Acres Treated	Number of Treatments
1990	VectoBac (CG)	10,500 lbs of AI/acre	1190	17 applications
1991	VectoBac(CG)	11,900 lbs of AI/acre	1190	17 applications
1992	VectoBac (CG)	11,400 lbs of AI/acre	1190	17 applications
1993	VectoBac (CG)	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-5.** Locations of mosquito breeding and non-breeding sites at Wertheim NWR East and West Marshes for 2004.



**Map C-6.** Locations of mosquito breeding and non-breeding sites at Wertheim NWR East and West Marshes for 2005.

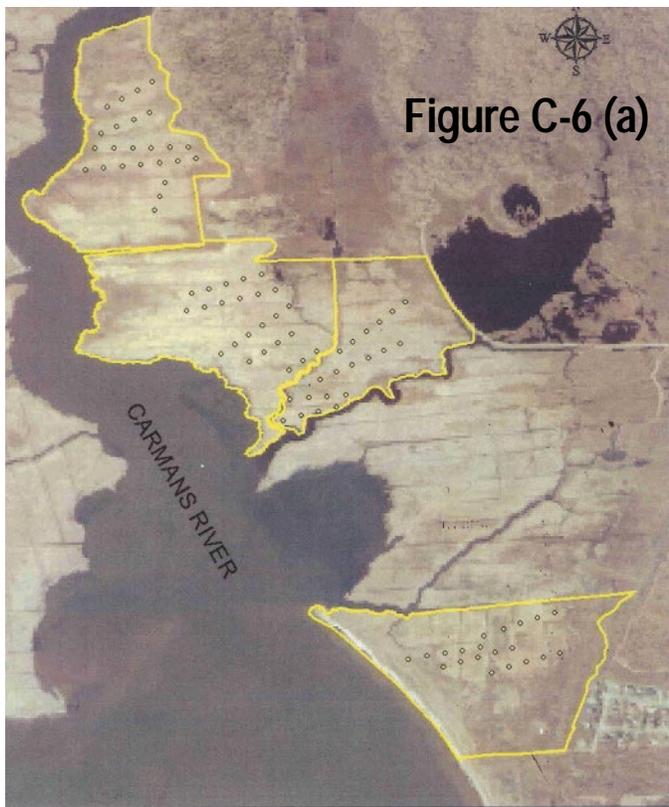


Figure C-6 (a)

**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 1  
 SUFFOLK COUNTY VECTOR CONTROL  
 OPEN MARSH WATER MANAGEMENT  
 DEMONSTRATION PROJECT  
 TRANSECT STATIONS  
 AREA 1 THRU 4  
 Cashen Associates, P.C.  
 CONSULTING PLANNING AND ENVIRONMENTAL MANAGEMENT

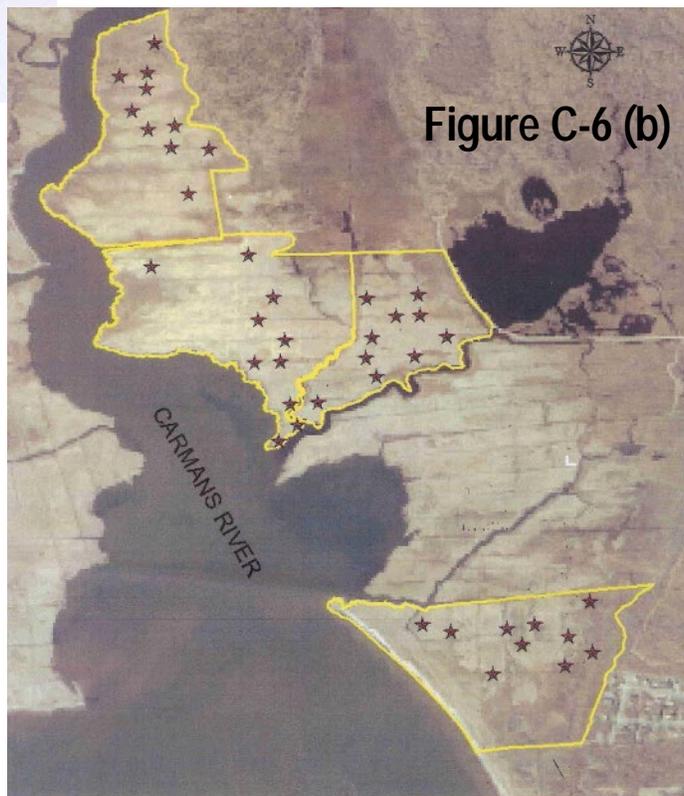
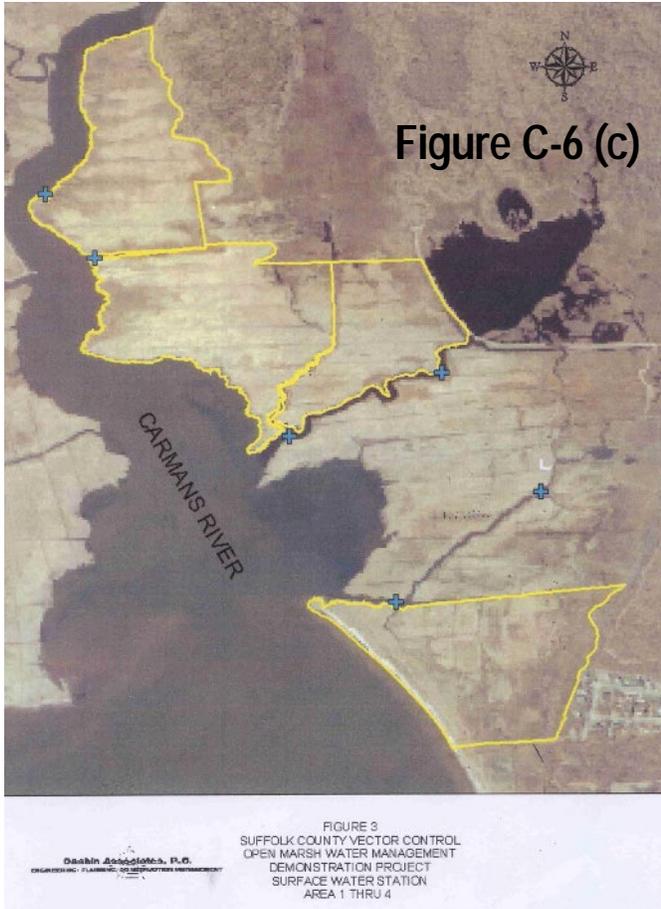


Figure C-6 (b)

**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 2  
 SUFFOLK COUNTY VECTOR CONTROL  
 OPEN MARSH WATER MANAGEMENT  
 DEMONSTRATION PROJECT  
 FISH STATIONS (2003-2004)  
 AREA 1 THRU 4  
 Cashen Associates, P.C.  
 CONSULTING PLANNING AND ENVIRONMENTAL MANAGEMENT



**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.*