



U.S. Fish and Wildlife Service

# Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges

*Comprehensive Conservation Plan*

*May 2004*



**Cover: Drawing of Cape May and Blackburnian Warblers and Monarch Butterflies**  
*Margaret Barnaby*



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

The *U.S. Fish and Wildlife Service* is the principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the 93-million acre National Wildlife Refuge System comprised of more than 540 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological services field stations. The agency enforces federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

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



# Comprehensive Conservation Plan

## *Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges*

### Refuge Vision Statement

Lying at the tip of the Delmarva Peninsula, the Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges are part of a national system of lands managed to ensure the future of wildlife and its habitats. These refuges serve as one of the country's most valuable stopovers for migratory birds. Nestled between the Atlantic Ocean and Chesapeake Bay, the refuges include a variety of habitats such as maritime forest, shrub thickets, grasslands, beaches, and tidal wetlands. These habitats provide a vital link for millions of songbirds, raptors, shorebirds, and butterflies to rest and refuel before continuing the rigorous journey to their wintering grounds.

Future conservation efforts lie in the refuges' commitment to protecting and enhancing the migration corridor through preserving, acquiring, and revegetating hardwood, shrub, and grassland areas. Alliances with nearby landowners will increase available habitat and research will focus on augmenting our knowledge to make biologically sound management decisions. The thousands of people who annually visit this gateway to the Eastern Shore of Virginia will gain an appreciation of the refuges' unique ecological role. In partnership with the local community, the refuges will also promote the area as a regional tourist destination that contributes to the economic stability of and enhances the quality of life on the Eastern Shore of Virginia. Visitors will leave with an understanding that this place of incredible diversity and ecological importance is part of a larger network of protected lands within the National Wildlife Refuge System, set aside specifically for wildlife.

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May 2004

# Comprehensive Conservation Plan Approval

## for Eastern Shore of Virginia and Fisherman Island Refuges

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**May 2004**



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**Snow geese in migration**

*USFWS photo*

# Purpose of and Need for Plan

- Introduction
- Refuge Overview
- Purpose of and Need for Plan
- Establishing Legislation
- National and Regional Mandates Guiding the CCP
- Other Legal and Policy Guidelines
- CCP Planning Process
- Refuge Vision
- Refuge Goals
- Planning Issues
- Step-Down Management Plans

## Introduction and Background

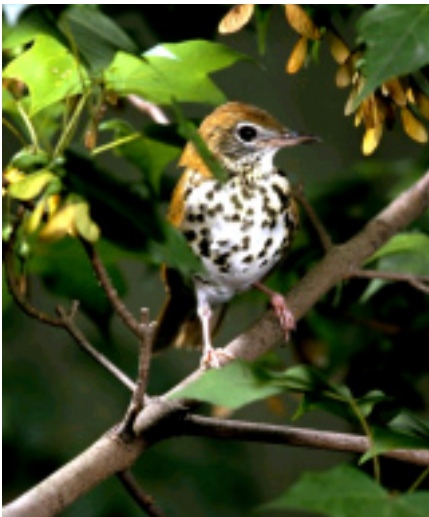
This CCP is the culmination of a planning process that began in 1999. Meetings with the public, the State, and conservation partners were held to identify and evaluate management alternatives. A draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) were distributed in September 2003. This final CCP presents the management goals, objectives, and strategies that we believe will best achieve our vision for the refuge, contribute to the National Wildlife Refuge System (Refuge System) mission, achieve the purposes of the refuges, fulfill legal mandates, and serve the American public.

## Refuge Overview

This CCP covers the Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges (refuges) (see Map 1-1).

### Eastern Shore of Virginia National Wildlife Refuge

The Eastern Shore of Virginia Refuge consists of 1,123 acres. Of that total acreage, 1,015 acres are located at the southern tip of the Delmarva Peninsula in Northampton County, Virginia, at the mouth of the Chesapeake Bay (see Map 1-2). The remaining 108 acres are located on Skidmore Island, which lies one mile east of the mainland.



**Wood thrush, a neotropical migratory bird of the Eastern Shore of Virginia Refuge.**

*USFWS photo*

The Eastern Shore of Virginia Refuge contains a variety of habitats such as maritime forest, myrtle and bayberry thickets, grassland, fresh and brackish ponds, tidal salt marsh, and beach. The refuge and its adjoining woodlands are considered one of the most important migratory bird concentration points along the East Coast. This importance stems from the fact that the Delmarva Peninsula acts as a geographic funnel for migratory birds in the fall. Millions of migratory birds rest and feed on the Eastern Shore of Virginia Refuge until favorable winds assist them in crossing the Chesapeake Bay.

### Fisherman Island National Wildlife Refuge

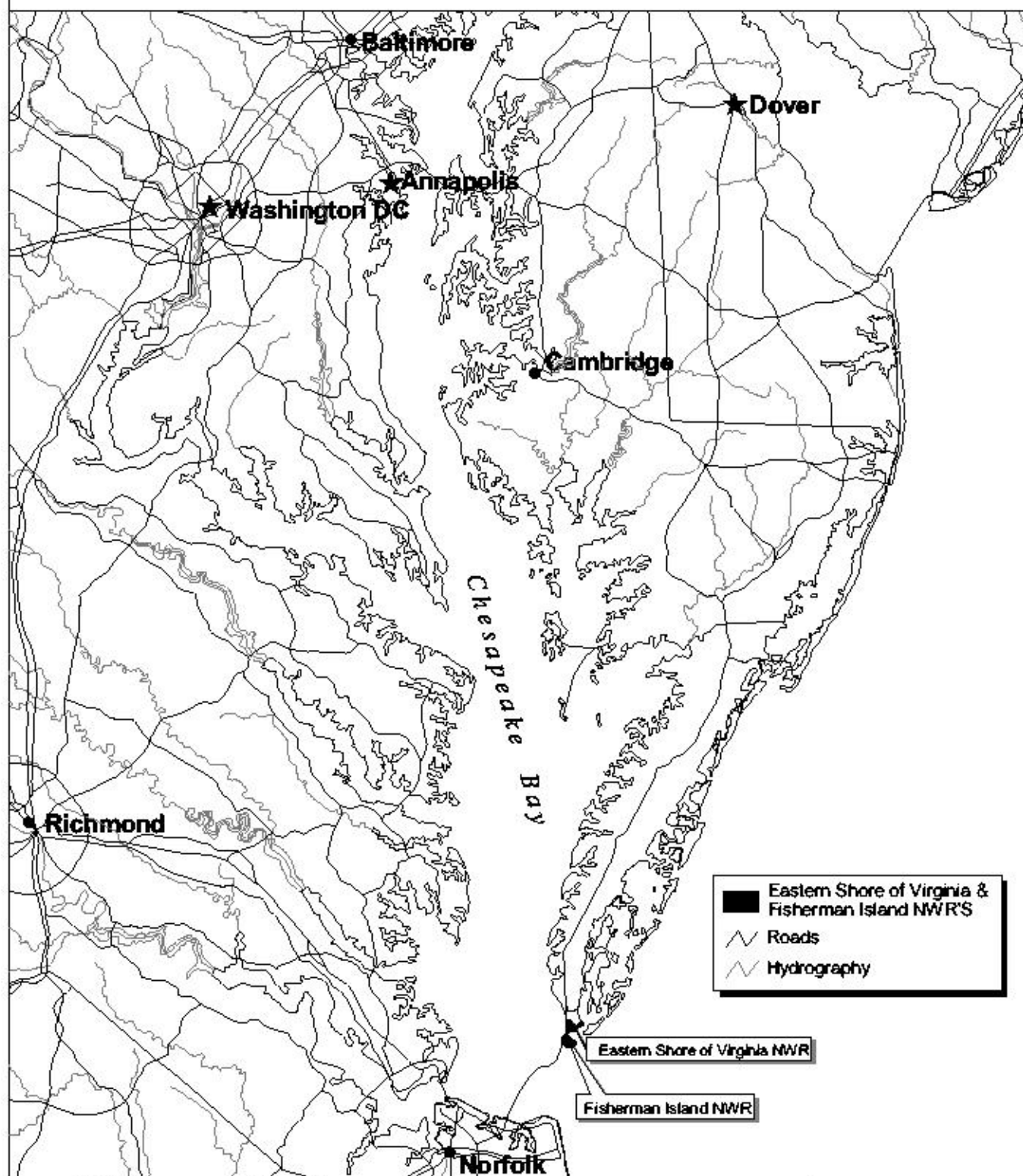
Fisherman Island is Virginia's southernmost barrier island. It is separated from the Eastern Shore of Virginia Refuge by approximately one-half mile of sea called Fisherman's Inlet (see Map 1-3). Accretion continues to expand the island's size, currently estimated at 1,850 acres.

Habitat succession has formed a mosaic of vegetative communities capable of withstanding the harsh conditions present on the island. The variety of habitats combined with the geographic location of the island, the accessibility of food, protective shrub and thicket cover, and minimal human disturbance make this island an important stopover location for migratory birds. Fisherman Island, however, is not undisturbed. The Chesapeake Bay Bridge-Tunnel (Bridge-



# Vicinity Map

## *Eastern Shore of Virginia & Fisherman Island Refuges*



## Data Sources:

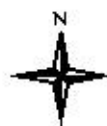
All base data provided by USGS. Ecosystem and Refuge Boundaries provided by USFWS.

Map prepared for the Eastern Shore of Virginia NWR & Fisherman Island NWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Service Section, March 2003

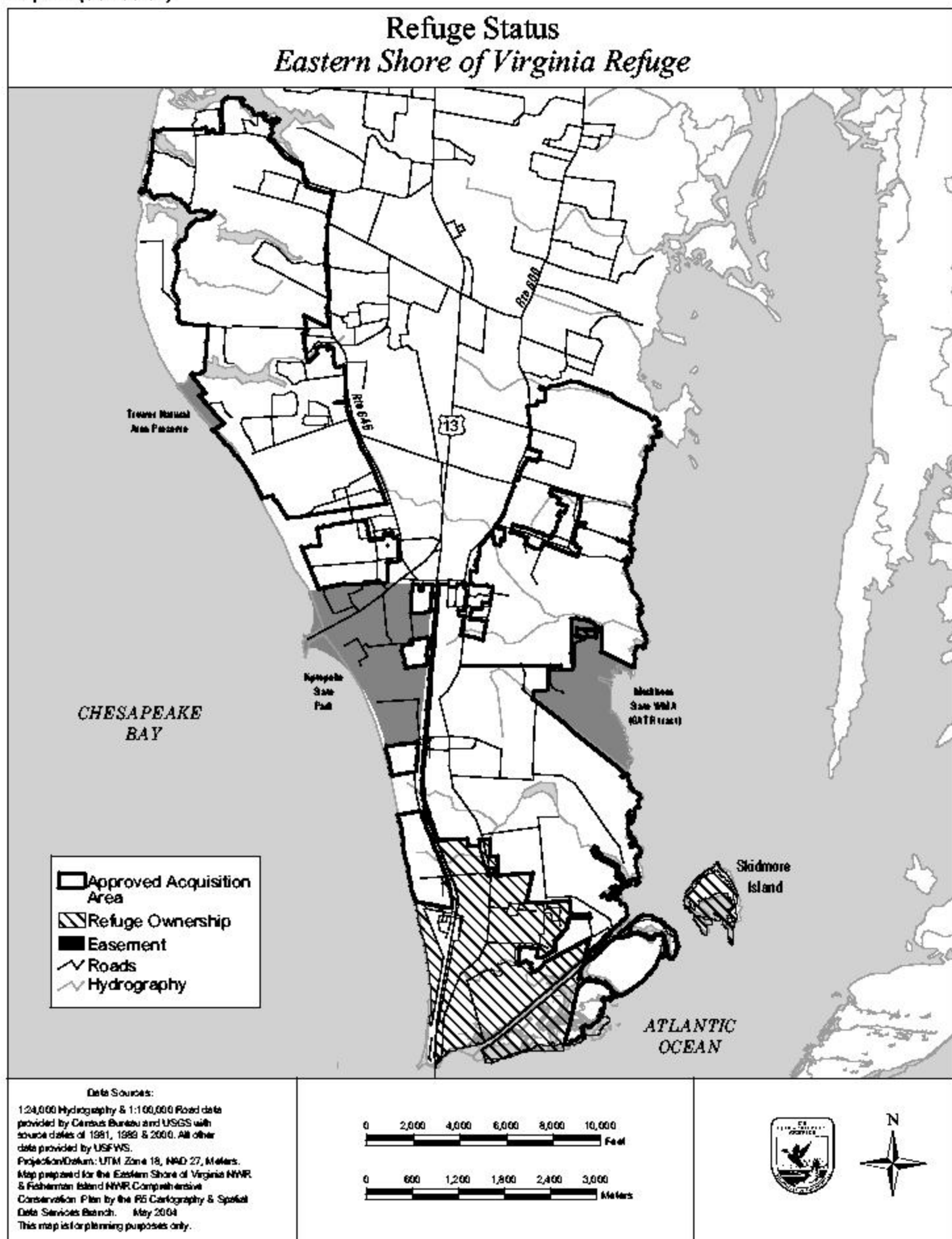
This map is for planning purposes only.

0 20 40 60 Miles

0 30 60 90 Kilometers

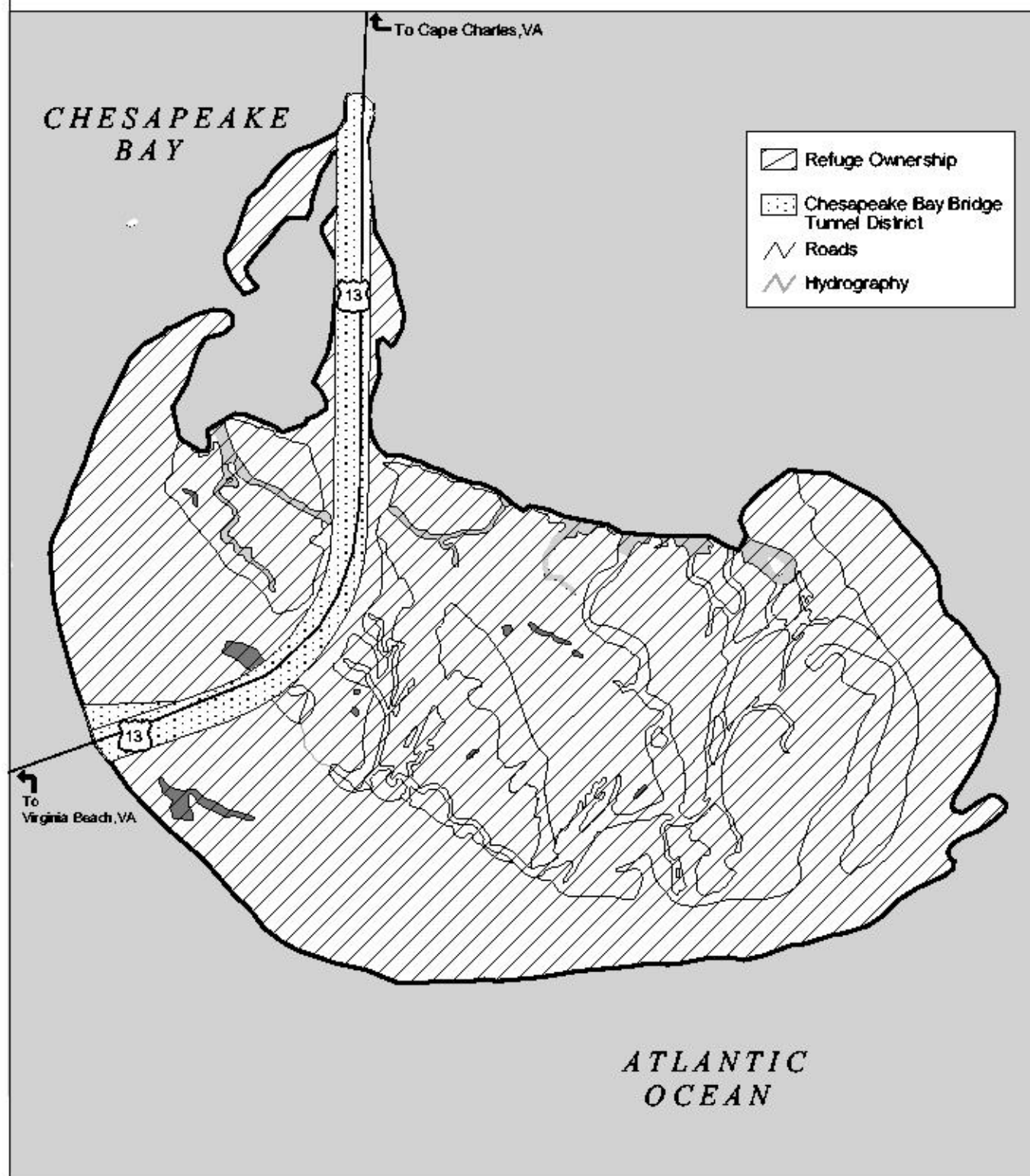


Map 1-2 (Corrected)



# Refuge Status

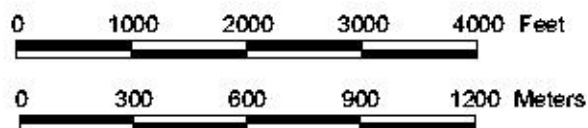
## Fisherman Island Refuge



**Data Sources:**  
 1:24,000 Hydrography & 1:100,000 Road  
 data provided by USGS with source dates  
 of 1981 & 1989. All other data provided by  
 USFWS. Projection/Datum: UTM Zone 18,  
 NAD 83, Meters.

Map prepared for the Eastern Shore of  
 Virginia MWR & Fisherman Island MWR  
 Comprehensive Conservation Plan by the  
 RS Cartography & Spatial Data Services  
 Section, March 2003

This map is for planning purposes only.



Tunnel), which links mainland Virginia to the eastern shore, cuts through the western part of the island.

### Refuge Land Acquisition History

Eastern Shore of Virginia Refuge was created in 1984 when 180 acres were transferred to the Service from the U.S. Air Force through the General Services Administration. In 1995 the Chesapeake Bay Bridge-Tunnel Authority (Bridge-Tunnel Authority) conveyed a 70-acre tract to the U.S. Fish and Wildlife Service (Service). This was done in compliance with a requirement of mitigation for the parallel crossing of the Chesapeake Bay

Bridge-Tunnel. In 1997 the Bridge-Tunnel Authority gave the Service a 66-foot-wide abandoned railroad bed (19 acres) in return for a four-acre parcel on Fisherman Island. The parcel on Fisherman Island was used to construct the abutments for the new Chesapeake Bay Bridge-Tunnel. The most recent land acquisition activity was the purchase of the Wise Point Corporation property (376 acres) in 2001. Total acreage for the refuge is now 1,123 acres.

The Eastern Shore of Virginia refuge also includes Skidmore Island, sometimes called “Long Point Island”, located

approximately 1,000 feet off the mainland. The Service purchased the 108.5 acre-island from the Nature Conservancy in 1987.

Fisherman Island Refuge was established in 1969, but it was not until 1973 that sole ownership rights were transferred to the Service by the Department of the Navy. Recent land acquisition activities include the purchase of Fisherman Island’s eastern half (825 acres) in 1998 and transfer of the remaining 25 acres from the U.S. Navy in 2000 to complete the refuge. Total acreage for Fisherman Island Refuge is now estimated at 1,850 acres, though that number fluctuates with accretion and erosion events.

A summary of the land acquisition history for both refuges is available in the following tables:



**Eastern Shore of Virginia Refuge.**  
*USFWS photo*

Table 1.1 Eastern Shore of Virginia National Wildlife Refuge - Land Acquisition History

<b>Year Acquired</b>	<b>Acres (rounded)</b>	<b>Comments</b>
1984	180	Transfer from U.S. Air Force (tract 4,8,16,17,21,22,23,27)
1986	369	Purchases from The Nature Conservancy (former CBBTD*) (tract 10a-b)
1987	108.5	Purchase of Skidmore Island (tract 10c, 10c-I)
1995	70	Mitigation for Bridge expansion (tract 15, 15a)
1997	19	Railroad ROW (tract 15b, 15c)
2001	376	Wise Point Corporation Tract (tract 11)
<b>Total</b>	1,122.5	

\* CBBTD Chesapeake Bay Bridge-Tunnel District

Table 1.2 Fisherman Island National Wildlife Refuge - Land Acquisition History

<b>Year Acquired</b>	<b>Acres (rounded)</b>	<b>Comments</b>
1973	1,000	Transfer from Navy (tract 10)
1998	835	Eastern portion of island (tract 11)
2000	25	Recent Navy transfer along Rt. 13 (tract 14)
<b>Total</b>	1,850	



## Purpose of and Need for Plan

Developing a Comprehensive Conservation Plan (CCP) is vital to refuge management. The purpose of this CCP is to establish strategic management direction over the next 15 years by:

- Providing a clear statement of the desired future conditions for habitat, wildlife, visitor services, and facilities;
- Providing refuge neighbors, visitors, and partners with a clear understanding of the reasons for management actions;
- Ensuring that refuge management reflects the policies and goals of the National Wildlife Refuge System (Refuge System) and fulfills legal mandates;
- Ensuring the compatibility of current and future public uses and other refuge uses;
- Providing long-term continuity and direction for refuge management;
- Providing direction for staffing, operations, maintenance, and developing budget requests.



**Saltmarsh view, Eastern Shore of Virginia NWR.**

*USFWS photo*

The need to develop a CCP for each of the refuges is two-fold. First, the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) requires all National Wildlife Refuges to have a CCP in place by 2012 to help fulfill the mission of the Refuge System. Second, there is currently no master plan establishing priorities and ensuring consistent and integrated management for the two refuges.

## Legislation Establishing Refuge Purposes

Refuges can either be established administratively under several authorities or established with specific legislation by Congress. The Eastern Shore of Virginia Refuge was established administratively through the following authorities:

*Transfer of Certain Real Property for Wildlife Conservation Purposes Act* (16 U.S.C. 667b–667d): “authorizing land to be transferred without reimbursement to the Secretary of the Interior if the land has particular value for migratory birds.”

*Refuge Recreation Act* (16 U.S.C. 460k–460k–4): “authorizing acquisition of lands and interests suitable for: 1) fish and wildlife-oriented recreation, 2) protection of natural resources, and 3) conservation of endangered or threatened species...”

*Migratory Bird Conservation Act* (16 U.S.C. 715–715d, 715e, 715f–715r): authorizing the acquisition of land “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.”

Fisherman Island Refuge was established administratively through the following authorities:

*Transfer of Certain Real Property for Wildlife Conservation Purposes Act* (16 U.S.C. 667b–667d): “authorizing land to be transferred without reimbursement to the Secretary of the Interior if the land has particular value for migratory birds.”

*Migratory Bird Conservation Act* (16 U.S.C. 715–715d, 715e, 715f–715r): authorizing the acquisition of land “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.”

## **National and Regional Mandates Guiding the CCP**

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

### **U .S. Fish and Wildlife Service and its Mission**

National Wildlife Refuges are managed by the Service, part of the Department of Interior. The mission of the Service is:

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

Natural resources entrusted to the Service for conservation and protection are: migratory birds, endangered species, interjurisdictional fish, wetlands, and certain marine mammals. The Service manages the Refuge System and National Fish Hatcheries, enforces federal wildlife laws and international treaties on importing and exporting wildlife, assists with state fish and wildlife programs, and helps other countries develop wildlife conservation programs.

### **The National Wildlife Refuge System and its Mission**

The Refuge System is the world’s largest collection of lands set aside specifically for the conservation of wildlife and ecosystem protection. The Refuge System began in 1903 when President Theodore Roosevelt designated three-acre Pelican Island, a pelican and heron rookery in Florida, as a bird sanctuary. Today over 535 National Wildlife Refuges exist in every state and in a few U.S. Territories, totaling more than 93 million acres nationwide. Over 34 million visitors annually hunt, fish, observe and photograph wildlife,

and participate in environmental education and interpretive activities on refuges.

Congress passed the National Wildlife Refuge System Improvement Act in 1997. This legislation established a unifying mission for the Refuge System, a new process for determining compatible public use activities on refuges, and the requirement to prepare CCPs for each refuge. The Refuge Improvement Act states that, first and foremost, the Refuge System must focus on wildlife conservation. It further states that the national mission, coupled with the purpose(s) for which each refuge was established, will provide the principal management direction for each refuge. The mission of the Refuge 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”* (National Wildlife Refuge System Improvement Act of 1997, Public Law 105–57).

The Refuge Improvement Act identifies six wildlife-dependent public uses—hunting, fishing, wildlife observation and photography, environmental education and interpretation—that should be facilitated on National Wildlife Refuges and shall receive priority consideration in the CCP process. The Act also declares that all existing or proposed refuge uses must be “compatible” with the purposes of the refuge and the mission of the system. The refuge manager determines if an existing or proposed refuge use is compatible by ensuring the use does not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge.



**Saltmarsh view, Fisherman Island NWR**

*USFWS photo*

### Land Acquisition Policy

The Service acquires land and waters for the Refuge System consistent with legislation, congressional guidelines and Executive Orders for the conservation of fish and wildlife and their related habitat, and to provide wildlife-dependent public use for educational and recreational purposes (USFWS 1982). Land acquisition planning typically identifies important wildlife habitat in need of protection. Such protection can be obtained by Service acquisition or through the efforts of other agencies, interests or individuals. Acquisition of a new refuge or major additions to existing refuges normally require an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) to comply with NEPA. The EA or EIS process establishes an acquisition boundary and approves land acquisition within that boundary. The CCP/EA implemented the EA process and therefore complies with NEPA.

## Other Service Guidance and Conservation Plans

While the Refuge System mission and the purposes for which each refuge was established provide the foundation for management, National Wildlife Refuges are also governed by other Federal laws, Executive Orders, treaties, interstate compacts, regulations, and conservation initiatives pertaining to the conservation and protection of natural and cultural resources. Listed below are the guidelines that are most pertinent to this CCP.

The U.S. Fish and Wildlife Service Manual and the National Wildlife Refuge System Manual contain Service policies providing guidance on planning and the day-to-day management of a refuge.

### Fulfilling the Promise

A 1999 report entitled “Fulfilling the Promise, The National Wildlife Refuge System: Visions for Wildlife, Habitat, People and Leadership” (USFWS 1999a) is the culmination of a year-long process by teams of Service employees to evaluate the Refuge System nationwide. This report was the focus of the first National Refuge System Conference, held in October 1998 and attended by refuge managers, other Service employees, and representatives from leading conservation organizations. The report contains 42 recommendations packaged with three vision statements dealing with wildlife and habitat, people, and leadership. This CCP deals with all three of these major topics, and we have looked to the recommendations in the document for guidance throughout the plan. For example, the “Fulfilling the Promises” document specifically recommends developing systematic species and habitat monitoring. In this CCP, we establish the need to conduct standardized surveys and to use peer-reviewed protocols to collect baseline and trend data on plants and animals located on the Eastern Shore of Virginia and Fisherman Island Refuges. The 1999 report also recommends forging new alliances through citizen and community partnerships and strengthening partnerships with the business community. One of our goals in the CCP is devoted almost entirely to partnerships and most of the other goals include at least some objectives and/or strategies which direct the refuge to forge new partnerships or strengthen existing ones.

### North American Waterfowl Management Plan

The North American Waterfowl Management Plan (NAWMP), signed by the United States and Canada in 1986 and by Mexico in 1994, offers a strategy to protect North America’s remaining wetlands and to conserve waterfowl populations through habitat protection, restoration, and enhancement (USFWS 1988). The plan was updated in 1998 with an emphasis on strengthening its biological foundation, using a landscape approach, and expanding partnerships. Implementation of this plan is accomplished in the U.S. within 12 regional habitat “Joint Venture” areas.

Partnerships are formed for the purpose of protecting habitat within Joint Venture Areas and involve Federal, state, and provincial governments, tribal nations, local businesses, conservation organizations, and individual citizens. The Eastern Shore of Virginia and Fisherman Island Refuges are located within the Atlantic Coast Joint Venture area, which covers the entire Atlantic Coast states and Puerto Rico. The goal for the Atlantic Coast Joint Venture is to “Protect and manage priority wetland habitats for migration, wintering, and production of waterfowl, with special consideration to black ducks, and to benefit other wildlife in the joint venture area.”



**Gadwall duck with duckling.**  
*USFWS photo*

Virginia's eastern shore is one of 10 focus areas identified in the Joint Venture Plan for the State of Virginia. Priority habitats include tidal brackish high marsh bordering the eastern side of the Chesapeake Bay. Those marshes support populations of migrating, wintering, and nesting black ducks. Other dabbling ducks use the area during migration and wintering, as do Canada Geese. Associated wetlands are valuable to numerous species of finfish and shellfish as nursery and production areas. The Joint Venture Plan identifies 57,575 acres in Virginia for protection and 2,825 acres for enhancement.

The Atlantic Coast Joint Venture Plan is being revised to reflect the expanded geographic area and vision of the Joint Venture area. The revised plan will have a stronger scientific basis for habitat and population goals. Focus areas have been revised in cooperation with state partners. These focus areas are based on important waterfowl areas, but also take into account the needs of other migratory birds. Eastern Shore of Virginia and Fisherman Island Refuges are both within the Delmarva Peninsula Focus Area. Information from the Atlantic Coast Joint Venture Plan will be integrated with information from the other major migratory bird initiatives—Partners in Flight, U.S. Shorebird Conservation Plan, and North American Waterbird Conservation Plan—in the seven Bird Conservation Regions in the Joint Venture area. The full revised implementation plan should be available in 2004.

#### **Partners in Flight: Mid-Atlantic Coastal Plain Bird Conservation Plan**

The Partners in Flight (PIF) Program has developed a draft plan for the Mid-Atlantic Coastal Plain Physiographic Area (USFWS 1999b). The challenge, according to the plan, is managing human population growth while maintaining functional natural ecosystems. To meet this challenge, the plan identifies priority land bird species and habitat types, and recommends specific objectives aimed at protecting those species and their breeding habitats. We use the components of this plan as one of the guidelines in directing bird management on the Eastern Shore of Virginia and Fisherman Island Refuges. The plan ranks species conservation importance within a regional area based on a variety of factors including global threats to





**Prairie warbler.**  
*USFWS photo*

the species, high concern for regional or local populations, or responsibility for conserving large or important populations of the species. Examples of high conservation priority species on Fisherman Island include the seaside sparrow, prairie warbler, clapper rail, and American black duck. The Eastern Shore of Virginia Refuge provides breeding habitat for high priority species such as prairie warblers, northern bobwhite, eastern towhee, field sparrow, and yellow-billed cuckoo. Our planning objectives and strategies were devised to benefit breeding populations of these species in conjunction with migrant habitat objectives whenever possible.

The PIF draft plan also ranks habitats based on overall conservation priority. Six of the eight habitat types identified in the plan are currently found on the Eastern Shore of Virginia or Fisherman Island Refuges. These are barrier and bay islands, salt marsh, forested wetland, mixed upland forest, early successional, and fresh/brackish emergent wetland.

### **U.S. Shorebird Conservation Plan**

The United States Shorebird Conservation Plan (Brown, et al. 2001) was developed as a partnership between Federal, state and non-governmental organizations with the purpose of creating conservation goals, identifying critical habitat conservation needs, and promoting education and outreach programs to facilitate shorebird conservation. The plan has set goals at the hemispheric, national, and regional levels. At the regional scale, the Eastern Shore of Virginia and Fisherman Island Refuges fall into the North Atlantic planning region. Undeveloped wetlands and beaches are rare in this region, causing those habitats to be especially important. Species of concern in the region with a high conservation priority for either breeding, migrating, or wintering include piping plover, American oystercatcher, sanderling, whimbrel, and American woodcock. Strategies in the CCP, such as increased monitoring on Fisherman Island Refuge, address the need to protect these high priority shorebird species identified in the U.S. Shorebird Conservation Plan.

### **The Neotropical Migratory Songbird Coastal Corridor Study**

Repeated accounts of population declines for many neotropical migratory songbird species have sparked widespread concern that has given way to national and international conservation initiatives (Mabey et al. 1993). Although research and protection efforts have largely focused on fragmentation and loss of breeding and wintering habitats, migratory stopover habitats like the southern tip of the Delmarva Peninsula are in need of comparable attention. Indeed, because migration is a physiological stressful cycle in avian life, resources take on added significance.

In fall 1991, the Neotropical Migratory Songbird Coastal Corridor

Study (Mabey et al. 1993) examined the distribution and habitat associations of fall migrating landbirds within the coastal regions of four states along the Atlantic Coast—New Jersey, Delaware, Maryland and Virginia. Together, these states make up the Cape May and Delmarva Peninsulas, two areas known for their significant contribution to migratory bird stopover habitat. The study, which was initiated, funded, and guided by the Virginia Coastal Program, identified clear distribution patterns associated with neotropical migrants, suggesting that migrants are more abundant in areas close to coastlines (within 0–0.9 miles) than they are in areas farther from the coast, and that bay coastal zones have higher densities of migrants than seaside coastal zones or interior regions. This study was crucial in our decision to focus habitat management for the Eastern Shore of Virginia Refuge on providing neotropical migrants with food and cover habitat on the lower Delmarva Peninsula. We also relied heavily on this study to formulate our land protection strategies in this CPP, included as appendix E.



**Volunteer banding a tern.**

*USFWS photo*

### **The Ecosystem Approach to Fish and Wildlife Conservation**

Throughout the last decade, the Service has placed more emphasis in habitat and wildlife protection at the ecosystem level. To this end, the Service has initiated new partnerships with private landowners, state and Federal agencies, corporations, conservation groups, and volunteers. Implementing an ecosystem approach to management is a top national priority for the Service. To further this priority, 52 Ecosystem Teams were formed across the country, typically using large river watersheds to define ecosystems. Individual Ecosystem Teams are comprised of Service professionals and partners who work together to develop goals and priorities for research and management.

The Eastern Shore of Virginia and Fisherman Island Refuges are contained within two designated Service ecosystems—the Delaware River/Delmarva Coastal Ecosystem and the Chesapeake Bay/Susquehanna River Ecosystem (See Map 1-4).

The Delaware River/Delmarva Coastal Ecosystem encompasses more than 16,000 square miles within six states. It includes all areas that drain into the Delaware River or the Delaware Bay and all areas that drain into the Atlantic Ocean between Cape Henlopen, Delaware and Cape Charles, Virginia, where the Eastern Shore of Virginia Refuge is located. The Delaware River is the last free-flowing major river on the East Coast, and the barrier island system from Assateague Island to Fisherman Island is the largest remaining undeveloped barrier island system along the Atlantic coast.

The Delaware River/Delmarva Coastal Ecosystem Team developed a plan (USFWS 1996a) based on a set of “Resource Priorities,” or goals, reflecting concern for priority species, habitat types of significance to the Service’s trust resources, and geographic focus areas within the ecosystem. Those Resource Priorities are:

**Migratory Birds:** Protect, restore, and enhance migratory bird habitats and populations, with emphasis on the coastal migration corridor.

**Wetlands:** Protect, restore, and enhance wetland habitats, with emphasis on Service-owned wetlands and other areas of exceptional values.

**Interior Forests:** Preserve, manage, and prevent further fragmentation of forest habitats suitable for migratory birds, threatened and endangered species, and other interior forest wildlife.



**Bald eagle, occasionally seen on the refuges.**

*USFWS photo*

**Endangered and Threatened Species:** Protect and enhance populations of threatened, endangered, and candidate species and their habitats.

**Interjurisdictional Fish:** Protect and enhance populations of interjurisdictional fish and their habitats.

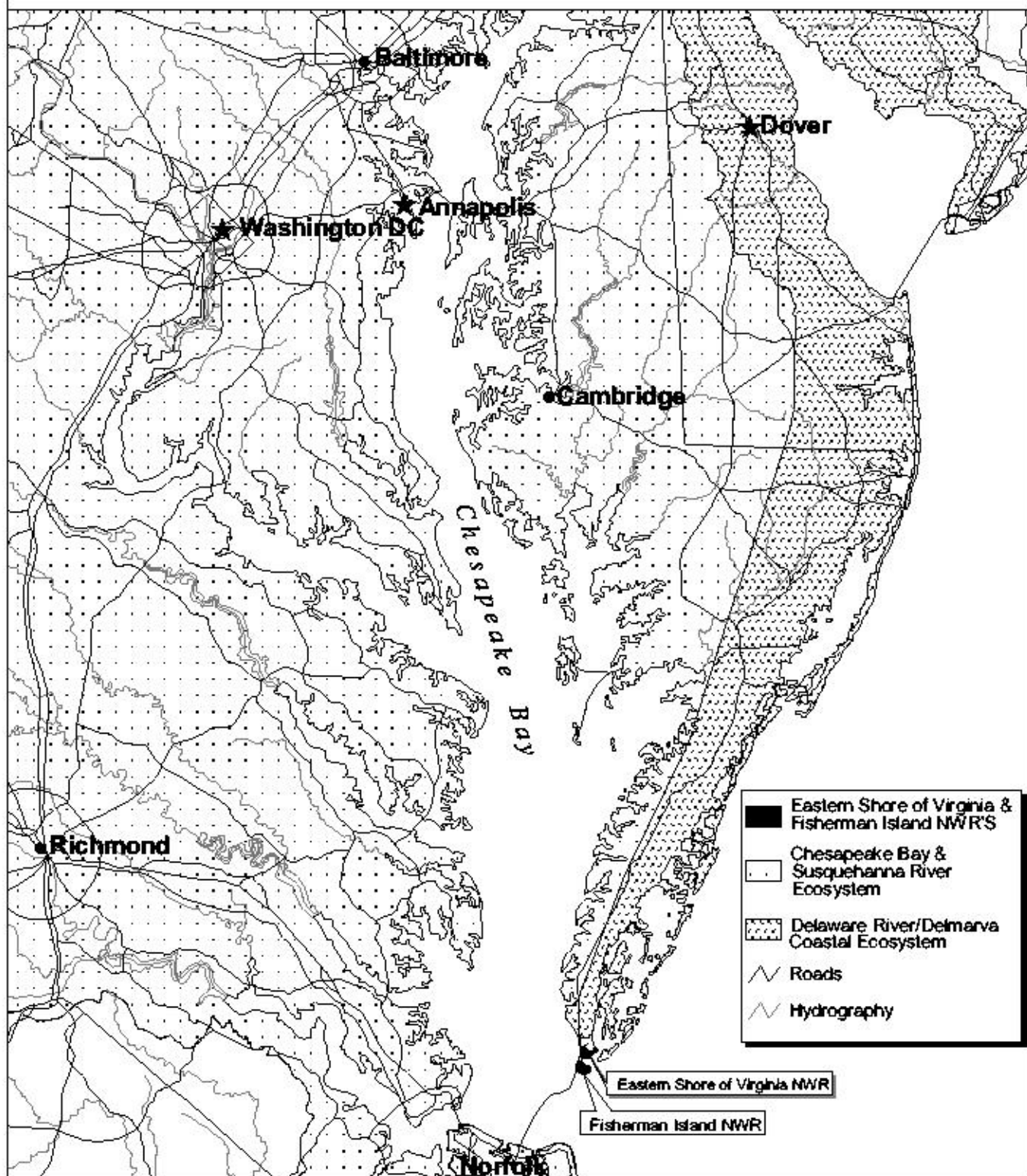
**Service-owned lands:** Protect, restore, and manage trust resources on Service-owned lands.

The Ecosystem team drafted numerous actions necessary to achieve the above Resource Priorities. Many of those actions directly involve Eastern Shore of Virginia Refuge. For example, one of the actions supporting Resource Priority 1 is to protect key migration stopover areas for migratory birds, with an emphasis on the Eastern Shore of Virginia and Cape May, New Jersey. These two areas function together as critical migration habitat on the mid-Atlantic Coast.

The second ecosystem in which Eastern Shore of Virginia Refuge and Fisherman Island Refuge are contained is the Chesapeake Bay/Susquehanna River Ecosystem. This area spans a basin of 64,000 square miles, encompassing portions of Delaware, Maryland, Pennsylvania, New York, Virginia, West Virginia and the District of Columbia. Waters from this expansive landscape flow into the largest estuary in the United States.

Similar to the Delaware River/Delmarva Coastal Ecosystem Team's plan, the Chesapeake Bay/Susquehanna River Ecosystem Team's 1997 plan (USFWS 1997a) contains goals directed toward the protection of migratory birds, wetlands, endangered and threatened species, interjurisdictional fisheries and additional land. The Chesapeake Bay/Susquehanna River Ecosystem Team also included water quality and environmental contaminants as issues to address in its plan.

# Chesapeake Bay/Susquehanna & Delaware River/Delmarva Coast Ecosystems Eastern Shore of Virginia & Fisherman Island Refuges



## Data Sources:

All base data provided by USGS. Ecosystems and Refuge Boundaries provided by USFWS.

Map prepared for the Eastern Shore of Virginia NWR & Fisherman Island NWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section, March 2003

This map is for planning purposes only.

0 20 40 60 Miles



0 30 60 90 Kilometers





## Regional Wetland Concept Plan, Emergency Wetlands Resource Act, Northeast Region

In 1986, Congress enacted the Emergency Wetlands Resources Act to promote the conservation of our nation's wetlands. The Act directed the Department of the Interior to develop a National Wetlands Priority Conservation Plan identifying the location and types of wetlands that should receive priority attention for acquisition by Federal and state agencies using Land and Water Conservation Fund appropriations. In 1990, the Service's Northeast Region completed a Regional Wetlands Concept Plan (USFWS 1990) to provide more specific information about wetland resources in the Northeast. The Regional Plan identifies 850 wetland sites that warrant consideration for acquisition. It also identifies wetland values, functions, and potential threats for each site. There are 205 wetland sites for the state of Virginia, four of which are located either on one of the refuges or within our proposed expanded boundary. Those four sites are Butlers Bluff (50 acres), Fisherman Island (1,500 acres), Magothy Bay (1,600 acres), and Plantation Creek (700 acres).

### Northeastern Beach Tiger Beetle Recovery Plan

The Northeastern beach tiger beetle (*Cincindela dorsalis dorsalis*), a Federal listed species, has been recorded on the Chesapeake Bay side of the Eastern Shore of Virginia Refuge since 1989. The most recent survey of the tiger beetle on Virginia's Eastern Shore found 62 adults on the refuge and 18 on a private beach adjacent to the refuge's property (Knisley and Hill 1999). The refuge, however, has never had sufficient adult tiger beetles to warrant a larval survey. That survey would determine whether the refuge's tiger beetle population is a breeding population.

We will follow the management goals and strategies laid out in the Northeastern Beach Tiger Beetle Recovery Plan (USFWS 1994a) to guide actions related to the tiger beetle population on Eastern Shore of Virginia Refuge. The primary objective of this Recovery Plan is to remove the tiger beetle from the Federal List of Endangered and Threatened Wildlife and Plants. Recovery will require reestablishing and protecting viable populations of the species across its former range along the Atlantic Coast—from Cape Cod to central New Jersey—and permanently protecting viable populations along Chesapeake Bay beaches in Maryland and Virginia. Despite an increase in the number of known populations in the Chesapeake Bay area, the tiger beetle population there is by no means secure. Few sites are protected and many are threatened by human impacts such as habitat alteration and recreational activities.



## Other Recovery Plans

### *Piping Plover*



**Piping Plover.**  
USFWS photo

The Federal-listed piping plover (*Charadrius melodus*) was last recorded breeding on Fisherman Island Refuge in 1992. Refuge records show that plovers occurred in low numbers (1–3 pairs) between 1979 and 1992 except for 1982, 1986, 1987 and 1989, when no breeding birds were recorded. Refuge staff and researchers regularly observed modest numbers (up to six at one time) of feeding plovers during 2002 spring surveys on Fisherman Island Refuge, and sightings of plovers feeding on Eastern Shore of Virginia Refuge have occurred. Reasons for absence of recent nesting activity may include the sparse and declining numbers of breeding birds in this portion of the species' range, sub-optimal (but moderately suitable) habitat, and deterrence of plover courtship activities by roosting herring and great black-backed gulls. If plovers are found breeding on either refuge, we will implement recommended protection measures from the Revised Recovery Plan (USFWS 1996b).

### *Seabeach Amaranth*

Seabeach amaranth (*Amaranthus pumilus*) Federal-listed as threatened in 1993 by the U.S. Fish and Wildlife Service. The amaranth is native to the beaches of the barrier islands of the Atlantic Coast. An annual plant, this species appears to require extensive areas of barrier island beaches and inlets functioning in a relatively natural and dynamic manner, which allows it to expand in the landscape and occupy suitable habitat as it becomes available (USFWS 1996c). The plant often grows in the same areas selected for nesting by shorebirds such as plovers, terns, and skimmers. Threats include beach stabilization efforts (particularly the use of beach armoring, such as sea walls and riprap), intensive recreational use, and herbivory by webworms.

Seabeach amaranth has historically occurred in Northampton County. Since Fisherman Island has dynamic beaches, it is a potential host for seabeach amaranth. We propose strategies for conducting seabeach amaranth surveys on Fisherman Island and for protecting the plant if it is discovered.

### *Delmarva Fox Squirrel*

The Eastern Shore of Virginia Refuge is located in the historic range of the Federal-listed Delmarva fox squirrel (*Sciurus niger cinereus*). No fox squirrels are located on the refuge now, and the Delmarva Fox Squirrel Recovery Team has no specific plans to translocate the squirrel to the refuge. Generally, fox squirrels thrive in mixed deciduous-coniferous forests with large overstory trees, high densities of soft mast-producing hardwoods, and low densities of pine (USFWS 1993a). It is questionable whether the refuge has

enough suitable habitat to support a viable fox squirrel population. Another concern is that the introduced individuals would be genetically isolated and probably would not remain a viable population in the long term. Much of the land adjacent to the refuge is inhospitable (i.e. agricultural fields); thus, emigrating fox squirrels would have reduced survivorship. In addition, the grey squirrel population on the refuge would cause inter-specific competition which could decrease the fox squirrels' chance of survival.

### *Bald Eagle*

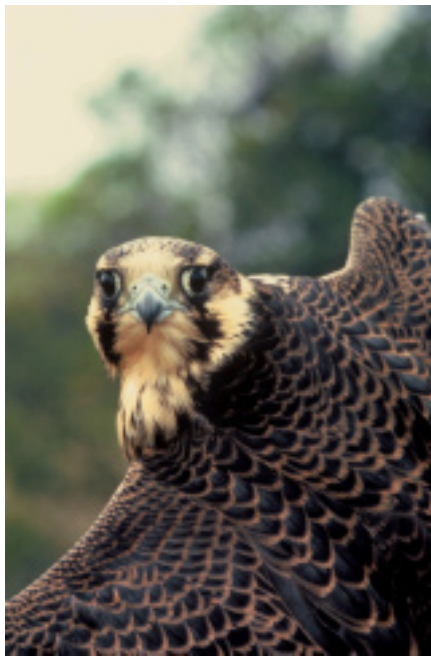
Although there are currently no bald eagles (*Haliaeetus leucocephalus*) nesting on either refuge, there are active eagle nesting territories within the CCP's proposed expansion area. We will follow the goals and strategies of the Recovery Plan if and when eagles begin nesting on refuge lands.

### *Peregrine Falcons*

There has been one nesting pair of peregrine falcons (*Falco peregrinus*) on Fisherman Island Refuge for several years. Although this species was delisted in 1999, we will look to the Recovery Plan for guidance on ways to sustain the nesting peregrine falcons on the refuge.

### *State Recovery Plans*

Currently, there are no recovery plans for State-listed species. However, if any recovery plans become available, we will use them whenever practical to manage State-listed species found on the refuges.



**Peregrine falcon.**  
*USFWS photo*

## **CCP Planning Process**

Given the mandate in the Refuge Improvement Act to develop a CCP for each national wildlife refuge, our Northeast Regional Office began the planning process for the Eastern Shore of Virginia and Fisherman Island Refuges in March 1999. Figure 1-1 illustrates the steps of the planning process and how they incorporate National Environmental Policy Act (NEPA) requirements.

First, the core planning team—consisting of field staff, staff from the Service's Northeast Regional Office, and staff from the Service's Washington Office—began the process of identifying the vision, goals, and issues for the refuges. Separate meetings were held to seek input from local and regional biological experts on natural resources.

We compiled a mailing list of more than 900 people made up of diverse individuals and groups including adjacent landowners, sports groups, environmental organizations, State fish and wildlife

Figure 1.1 Steps in the Comprehensive Conservation Planning Process



agencies, local businesses, and other interested and affected people. In August 1999, a newsletter was sent explaining the CCP process and identifying current issues on the refuges. The newsletter contained a workbook insert with questions to help collect the public's ideas, concerns, and suggestions associated with managing the Eastern Shore of Virginia and Fisherman Island Refuges. More than 80 workbooks were completed and returned with responses to the questions.

Three open houses and three public information meetings were held on August 24, 25, and 26 (1999) in Virginia Beach, Cape Charles, and Melfa, Virginia. Between five and 15 people attended each meeting. Meetings were advertised locally through news releases, paid advertisements, radio broadcasts, and through our mailing list. Each meeting consisted of an "open house" session where people could informally learn of the project and have their questions and concerns addressed. The public information meetings included a slide show of the refuges, a brief review of the Refuge System and the planning process, and a question and answer session. Participants were encouraged to actively express their opinions and suggestions.

We distributed another newsletter in November 1999 summarizing public comments from the workbook and from public meetings. The planning team held a series of workshops in November 1999 and January 2000 to discuss with partners issues including habitat management and public use. Individuals and groups participating in the workshops included adjacent landowners, State fish and wildlife agencies, local businesses, and other interested and affected people.

We then established the vision, goal statements, and planning issues and began developing alternative strategies by June 2001. We derived the strategies from public comment, follow-up contacts with partners, and planning team members.

On July 30, 2002 we held two public meeting at the Kiptopeke Elementary School in Eastville, Virginia to discuss the long-term management of the Wise Point boat ramp on the Eastern Shore of Virginia. The refuge acquired the Wise Point property, including the ramp, in January 2002. Since then, we have implemented interim management strategies until this final CCP was available. The purpose of the meeting was to invite public discussion on the management of the boat ramp. Over 65 people attended the meetings.

We released the Draft CCP/EA in September 2003 for a 45-day public comment period. We held public hearings and open houses in October 2003. A summary of public comments is included in Appendix B.

Each year we will evaluate our accomplishments under this CCP, including the completion of more detailed step-down plans. Monitoring will reveal whether resource objectives are being met



**Fisherman Island NWR.**  
*USFWS photo*

and whether we need to change our strategies. We will modify the CCP document and associated management activities as needed, following the procedures outlined in Service policy and NEPA requirements. This CCP will be fully revised every 15 years, or sooner if necessary.

## Refuge Vision

The vision statement was developed to describe the desired future status of the Eastern Shore of Virginia and Fisherman Island Refuges:

*Lying at the tip of the Delmarva Peninsula, the Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges are part of a national system of lands managed to ensure the future of wildlife and its habitats. These refuges serve as one of the country's most valuable stopovers for migratory birds. Nestled between the Atlantic Ocean and Chesapeake Bay, the refuges include a variety of habitats such as maritime forest, shrub thickets, grasslands, beaches, and tidal wetlands. These habitats provide a vital link for millions of songbirds, raptors, shorebirds, and butterflies to rest and refuel before continuing the rigorous journey to their wintering grounds.*

*Future conservation efforts lie in the refuges' commitment to protecting and enhancing the migration corridor through preserving, acquiring, and revegetating hardwood, shrub, and grassland areas. Alliances with nearby landowners will increase available habitat and research will focus on augmenting our knowledge to make biologically sound management decisions. The thousands of people who annually visit this gateway to the Eastern Shore of Virginia will gain an appreciation of the refuges' unique ecological role. In partnership with the local community, the refuges will also promote the area as a regional tourist destination that contributes to the economic stability of and enhances the quality of life on the Eastern Shore of Virginia. Visitors will leave with an understanding that this place of incredible diversity and ecological importance is part of a larger network of protected lands within the National Wildlife Refuge System, set aside specifically for wildlife.*

## Refuge Goals

The following refuge goals are intentionally broad, descriptive statements of purpose. They highlight specific elements of our vision statement and provide the foundation for our management emphasis. The goals are not in any order of priority.

1. Increase the availability of forage and cover habitat for neotropical and temperate migratory birds and migrating monarch butterflies.





**Hermit thrush, a temperate migratory bird.**

*USFWS photo*

2. Maintain the long-term productivity, integrity, and function of the marsh, beach, and interdunal communities.
3. Actively participate in the conservation of healthy hardwood, understory, and grassland habitat for neotropical and temperate migratory birds during future development throughout Northampton County.
4. Provide wildlife-dependent recreational opportunities and community outreach with an emphasis on educating the public about the critical role the Delmarva Peninsula serves for neotropical and temperate migratory birds and migrating monarch butterflies.
5. Integrate the refuge into the larger community of the eastern shore and promote awareness of the unique value of the lower Delmarva Peninsula to neotropical and temperate migratory birds and migrating monarch butterflies.
6. Enhance and restore the quality of the soils, waters, and other abiotic components of the refuge and landscape.

## Planning Issues

Key planning issues were first identified by refuge staff and then proposed for public comment in newsletters and during public scoping meetings. The original issues were then modified based on public input. The above six goals statements, together with the planning issues and the range of options on how to resolve them, formed the basis for developing and comparing the different management alternatives that were analyzed in the Draft CCP/EA. The following issues are in no order of priority:

**Boat ramp:** The Service purchased the Wise Point Corporation in-holding in December 2001. This in-holding provides access to deep water through an existing boat ramp. The boat ramp has historically been used by recreational boaters and commercial watermen. The refuge must balance its responsibility to protect sensitive wildlife habitat with its role in providing opportunities for wildlife-dependent recreational uses.

**Firearms range:** Refuge staff maintain a firearms range adjacent to the refuge, which is owned by Northampton County and used for law enforcement personnel training. The range was built 50 years ago and does not meet current design for contaminant standards. There are elevated levels of lead, arsenic, and antimony in the range area and it is unknown if these contaminants have migrated off-site. In addition, noise generated from range use conflicts with the serenity visitors seek while visiting the refuge.

**Communications tower:** There is a communications tower located on the refuge with a lease that expires in 2007. There has been some

interest by private industry and by Northampton County (County) in increasing the use of the tower. However, the tower is located in a major migratory bird flight path and may cause a number of bird fatalities.

**Contaminant levels:** There are known and suspected areas with elevated levels of contaminants because of past military and agricultural uses in and around the refuge.

**Land acquisition:** The tip of the peninsula is a major migratory bird resting/refueling site recognized by Federal and State resource agencies and the County's own Comprehensive Plan. As the eastern shore develops, the refuge and other natural areas become more critical to these long-distance travelers. The refuge is small in size. Preserving additional lands will help prevent the decline in wildlife.

**Habitat management:** Different species have different habitat needs. Due to the small size of the refuge, active management for every type of habitat and species is limited. Therefore, we have made decisions regarding which habitats should be emphasized and to what extent.

**Invasive plant species:** Non-native invasive plant species have taken over valuable habitat on the Eastern Shore of Virginia and Fisherman Island Refuges. Japanese honeysuckle, kudzu, fennel, and phragmites are just a few of the invasive species that choke out native food sources for neotropical and temperate migratory birds.



**Royal tern colony on Fisherman Island NWR.**

*USFWS photo*

**Fisherman Island:** Fisherman Island serves as a breeding and nursery area for numerous bird species, and supports the largest number of nesting royal terns and brown pelicans in Virginia. Our management goals have been aimed at protecting the sensitive natural resources by minimizing human impact to this ecosystem.

**Hunting program:** Current objectives are to maintain an annual deer hunt. However, modifications may be needed to increase the take of deer and to improve public safety adjacent to roads and trails.

**Beach access:** There is a small population of the Federal-listed Northeastern beach tiger beetle on a beach located on the Chesapeake Bay of the Eastern Shore of Virginia Refuge. This beach abuts other beach property that is privately-owned and operated by the Sunset Beach Resort. The resort's beach is open for public access and has seen an increase in use over the past five to 10 years. There is no physical barrier separating the refuge beach from the private beach, and beach-goers have not distinguished one from the other.



**Cultural resources:** Both refuges are home to many structures, including bunkers and abandoned buildings, that house materials and objects. Some of the materials dating back to World War II may have historic value and can be displayed at the Visitors Center or stored in temperature-controlled rooms. Other items can be donated to public or private organizations for display. Refuge staff need to make decisions on the final outcome of these resources.

## **Step-Down Management Plans**

The Refuge Manual (Part 4 Chapter 3) lists more than 25 step-down management plans that are generally required on most refuges. Step-down plans describe specific management directions that refuges will follow to achieve objectives or implement management strategies. Some require annual revision; others are revised on a 5 to 10 year schedule. Some require additional NEPA analysis, public involvement, and compatibility determinations before they can be implemented. A status list of refuge Step-down plans follows.

**These plans are current and up-to-date:**

2002	Hunt Plan
2000	Pollution Prevention Plan
1999	Contingency of Operations Plan
1995	Youth Conservation Corp Safety Plan

**These plans exist, but we consider them out of date and needing revision:**

1991 Wildlife Inventory Plan: A revision of this plan will be incorporated in a proposed Species Inventory and Monitoring Plan (see section below).

1993 Upland Habitat Management Plan: A revision of this plan will be included in a new Habitat Management Plan (see section below).

1994 Public Use Management Plan: This plan, to be updated by 2007, will elucidate management direction and priority for public use programs such as Visitor Center operation, environmental education, outreach events, volunteers, and partnerships.

1998 Safety Plan: This plan, to be updated by 2007, will detail the actions required, as per the Department of the Interior and U.S. Fish and Wildlife Service policy, to: 1) provide a safe environment for all employees, volunteers, and for the public when using our facilities; 2) identify and correct unsafe conditions; 3) eliminate unsafe acts; and 4) encourage accident prevention throughout the workforce.

**These step-down plans need to be initiated:**

This CCP requires that the following step-down plans to be

completed or updated. Additional management plans may be required as future Service policy dictates.

**Habitat Management Plan (2005):** Management strategies specific to forest, shrub, and grassland habitats will be detailed with an emphasis on forage and cover requirements for migratory bird species. Management strategies will include maintaining various successional stages of grassland and forest. This relates specifically to the objectives, goals, alternatives, purpose, and vision developed for the Eastern Shore of Virginia and Fisherman Island Refuges.

**Prescribed Burn Plan (2006):** This plan will describe the use of fire as a management tool to enhance forest understory regeneration and grassland habitat, to remove undesired species such as non-native invasive plants, and to reduce the fire hazard potential. Specific locations, methods, and timing will be described in accordance with U.S. Fish and Wildlife Service policy and will adhere to all Federal, State, and local guidelines and restrictions.

**Species Inventory and Monitoring Plan (2006):** This plan will provide specific guidance for the systematic accounting of temporal and spatial trends in the abundance and diversity of species. Inventories will obtain, at a minimum, information on the abundance and distribution of vascular plants, vertebrates, and Federally endangered and threatened species. Monitoring efforts will target carefully chosen species in an effort to convey information about the status of the larger ecological system and the integrity of specific habitats or ecosystem processes. Rigorous and quantitative monitoring will be oriented toward management decision to ensure scientifically-based management with proper feedback for adaptive management decisions.



**Red fox and prey.**  
*USFWS photo*

**Predator Management Plan (2006):** This plan will describe the control of identified problem predators such as gulls, fox, coyote, feral cats, and raccoons. The areas of concern are colonial seabird nesting colonies on Fisherman Island Refuge and migratory bird habitat on the Eastern Shore of Virginia Refuge. Management strategies will include both live trapping and lethal removal.

**Invasive Species Management Plan (2007):** This plan will describe the control of non-native plant and animal species such as Japanese honeysuckle, fennel, fescue grass, kudzu, autumn olive, phragmites, and other exotic species which pose a threat to refuge habitat and native species. Specific control methods and timing will be detailed for both the Eastern Shore of Virginia and Fisherman Island Refuges.

**Sign Plan (2007):** This plan will detail where signs are needed on the refuge and what those signs will communicate. While the refuge currently has some written guidelines for signs, it has no formal plan.

## Chapter 2



**The northern oriole is a Neotropical migrant that makes use of refuge habitat.**

*USFWS photo*

# Management Direction

- Management Focus
- Refuge Goals, Objectives, & Strategies
- General Refuge Management

## Management Focus

Our management focus is to protect, restore, and enhance habitat for forest and shrub-dependent neotropical and temperate migratory birds, while promoting compatible wildlife-dependent recreational opportunities in support of these efforts.

The lower Delmarva Peninsula is hemispherically important to migrating songbirds. The narrowing peninsula concentrates millions of southward migrating birds into this small area. Adequate cover and food along the migratory route are essential for the long-term viability of these species. Unfortunately, wildlife habitat on the peninsula is becoming fragmented with increased waterfront development and clearing of forest and shrub habitat, threatening the migration corridor. Virginia, Maryland, Delaware and New Jersey have experienced up to 60 percent declines in neotropical songbird numbers in recent history (Mabey et al., 1993). In light of these population declines and habitat losses, increased emphasis is needed to protect, restore, and enhance the lower Delmarva's critically located habitats with a focus on conserving hardwood forests and fruit producing shrubs for these avian migrants.

## Refuge Goals

Goals were developed for the Eastern Shore of Virginia and Fisherman Island refuges after reviewing applicable laws, policies, regional plans, the refuge vision statement, the purpose of each refuge, the Refuge System mission, and public comments.



**Yellow-rumped warbler.**  
*USFWS photo*

Refuge goals are broad, descriptive statements of purpose. They highlight specific elements of our vision statement and provide the foundation for our management emphasis. They further the refuges' focus on protecting, restoring, and enhancing habitat for forest and shrub-dependent neotropical and temperate migratory birds, while promoting compatible wildlife-dependent recreational opportunities in support of these efforts. The goals are not presented in order of priority.

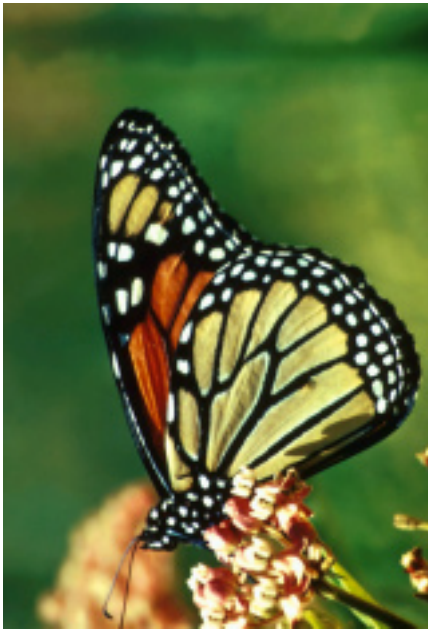
Each goal is further refined by a series of objective statements. Objectives are incremental steps to be taken toward achieving a goal and define the management emphasis in measurable terms where possible. The strategies for each objective are specific actions, tools, techniques, considerations, or a combination of these, which may be used to achieve the objective. Strategies may be revised or modified to achieve the desired outcome.

Together, the goals and objectives are unifying elements of successful refuge management. They identify and focus management priorities, provide a context for resolving issues, and offer a critical link between refuge purposes and the National Wildlife Refuge System mission. The following goals, objectives, and strategies provide management direction for the refuges over

the next 15 years. (Strategies are listed in five-year increments following the plan's approval)

## **GOAL 1: Increase the availability of forage and cover habitat for neotropical and temperate migrant birds and migrating monarch butterflies.**

### **Objective A: Hardwood-Dominated Forest**



**Monarch butterfly.**  
*USFWS photo*

To provide additional sources of high-quality forage for neotropical and temperate migrants, increase the amount of contiguous hardwood habitat (oaks, hickory, maples, and sweet gum) on the Eastern Shore of Virginia Refuge by converting existing open grassland habitat adjacent to forested stands.

*Rationale for the Objective:* Hardwood-dominated forests have a high food value for neotropical and temperate migratory birds because of the diverse understory associated with these habitats (Watts and Mabey 1994). Map 2-1 (page 2-8) depicts hardwood management units.

#### **Strategies:**

##### *1-5 years*

1. Determine appropriate hardwood management techniques including the number and variety of trees to be planted, planting location and schedule, and evaluation of deer impacts. Include proposed techniques in the habitat management plan.
2. Establish 10 x 10-meter plots to test treatment regimes for eliminating Japanese honeysuckle and kudzu encroaching on existing hardwood stands.
3. Plant two acres of mixed hardwoods in MU 6 to be specified in the habitat management plan (may include deer enclosure fencing).

##### *6-10 years*

4. Plant 15 acres of mixed hardwoods in MU 8 to be specified in the habitat management plan.
5. Convert two acres of grassland to mixed hardwoods and shrubs in the refuge housing area (areas between individual houses) through natural succession and plantings.
6. Develop an agreement with the Chesapeake Bay Bridge Tunnel (Bridge-Tunnel) Authority and Sunset Beach Resort to plant hardwoods on their property in areas contiguous to forested stands.

##### *11-15 years*

7. Plant 10 acres of mixed hardwoods within the old railroad right-of-way as specified in the habitat management plan.



## Objective B: Forest Understory

Increase the density and abundance of the forest understory in closed canopy pine stands (i.e., stands 20–80 years old) to provide forage for frugivorous and insectivorous neotropical and temperate migrants.

*Rationale for the Objective:* Establishing native shrubs and vines in forest openings increases fruit and insect abundance, thereby benefitting migratory birds (Blake and Hoppes 1986). We will create an experimental plot to determine the specific management practices necessary to create optimum fruit and insect abundance for birds throughout the migration and winter seasons.

### Strategies:

#### 1-5 years

1. Continue to conduct an annual deer hunt on Eastern Shore of Virginia Refuge to minimize the effects of deer browse on the understory.
2. Thin loblolly pine on Wise Point. To thin, we will use a chain saw on a 0.25-acre test plot within the 30 acres of forest at Wise Point. Only small sections will be thinned as the majority of the existing pines on Wise Point are of low vigor and will not respond to thinning and are likely to succumb to salt intrusion, senescence, and pine beetle infestation (Mallett 2001). Subsequent adjustments to thinning will be based on test plot results.
3. Leave standing dead trees (>15.2 cm diameter-breast-height, or dbh) within the 30-acre forest at Wise Point to increase the availability of forage (insects) for avian migrants (e.g., black-and-white warblers, ruby-crowned kinglets). In addition, snags will fulfill avian cavity nest site size requirements of species occurring on the refuge.
4. Develop a 15-year monitoring plan that outlines protocols for monitoring fruit production of forbs (pokeweed), shrubs and saplings (black cherry, viburnum), and vines (greenbrier, Virginia creeper, poison ivy). The monitoring plan will outline pre- and post-management monitoring to measure understory response to thinning.
5. Monitor the effects of deer on browse species and forage availability for neotropical migrants through the use of exclosures and control plots on both refuges.
6. Burn about 35 acres of loblolly pine stands at Wise Point to encourage a productive understory and kill pine seedlings.

#### 6-10 years

7. Manage loblolly pine stands that are approaching closed canopy conditions by removing trees as indicated above under Strategies 3–5.
8. Continue monitoring for fruit production and understory response to thinning. Based on monitoring results, manage stands where the canopy becomes closed.



**Loblolly pine.**  
*Charles Philip*

*11-15 years*

9. Continue monitoring understory growth. Based on monitoring results, manage stands where the canopy becomes closed.

### Objective C: Upland Shrub

Maintain and increase native shrub-dominated cover (e.g., bayberry, chokeberry, sumac, viburnum) and nectar-producing forbs (e.g., pokeweed, goldenrod) on the existing mid-successional management units (MU 2-6, 6A, 7, 9-11, 14, and Wise Point tip) to increase the availability of feeding and resting habitat for shrub-dependent migratory birds, including raptors, that rely on these resources.

*Rationale for the Objective:* Fruiting shrubs provide a fuel source for numerous fall migratory birds that pass through the lower Delmarva Peninsula during their southern migration. Struthers et al. (2000) observed fall migrants using shrub habitats more than wooded sites; as trees encroached and shaded fruit-bearing shrubs, bird use declined. In addition, because abundant numbers of fall migrating raptors hunt these shrub habitats, such habitats also provide an indirect food source. Increased nectar availability will also benefit migrating monarch butterflies. Map 2-1 (page 2-8) depicts shrub management units.

### Strategies:

*1-5 years*

1. Establish experimental plots to control invasive plants (e.g., Japanese honeysuckle, fennel, and kudzu) and evaluate the vegetative response to various treatment methods (e.g., mowing, prescribed burning, application of herbicides) prior to their widespread use. Monitor existing conditions prior to treatment.
2. Remove, using a chain saw or hydroaxe, approximately seven acres of loblolly pine adjacent to and encroaching on wax myrtle shrub habitat on the southern tip of Wise Point.
3. Remove, using a chain saw or hydroaxe, loblolly pine (< 25.4 cm dbh) from MUs 4, 5, 6, 6A, 7, and 10, leaving some scattered pines to provide winter and roosting cover.
4. While cutting loblolly pine in 6A, cut autumn olive shrubs and treat stumps with an approved herbicide to prohibit invasion once the area has been opened.
5. Allow grasslands in MUs 9, 10, and 11 to convert to shrub through natural succession.
6. Monitor the effects of deer on browse species and forage availability for neotropical migrants through the use of exclosures and control plots.
7. Assess breeding use by those Partners in Flight (PIF) priority species (e.g., prairie warbler, field sparrow) using maritime shrub thickets.



**Fennel, an invasive plant found on the refuges.**

*Mike Terry*



**Bayberry.***USFWS photo**6-10 years*

8. Burn cut areas on Wise Point (Strategy 2) and MUs 4, 5, 6, 6A, 7 and 10 (Strategy 3) to maintain newly created shrub habitats.
9. Monitor fruit production of forbs (pokeweed), saplings and shrubs (black cherry, bayberry, wax myrtle), and vines (greenbrier, Virginia creeper, poison ivy) using the same protocol developed in the fruit monitoring plan for forest understory (Objective B, Strategy 5).
10. Cut Management Units when pines and larger hardwoods (dbh > 15.2 cm [Denmon 1998]) invade. Cut fields in 14-acre rotational blocks (Berdeen and Krementz 1998) so that fruiting shrub habitat is always available. Conduct monitoring on two plots: one in both MU 5 and MU 7 to ascertain senescence and determine cutting schedule.
11. Develop an agreement with the Bridge-Tunnel Authority to manage pines on their property in the Wise Point area that are encroaching on wax myrtle shrub habitat.

*11-15 years*

12. Remove regenerating loblolly pine, using a bushhog or hydroaxe, to facilitate shrub growth in MU 10.
13. Continue to monitor and control invasives and suppress loblolly pine invasion on MUs 2-6, 6A, 7, 9-11, 14, and Wise Point tip.

**Objective D: Grasslands**

Establish a large contiguous block (78 acres) of native warm season grasses in MUs 1 and 13 to provide food sources, perches, and escape cover for grassland-dependent temperate and neotropical migratory birds. Vegetative cover will consist of 65–90 percent warm season grasses (e.g., little bluestem, Indian grass), 10–35 percent forbs (e.g., goldenrod, pokeweed), and 10–20 percent scattered native shrubs (e.g., groundsel, bayberry).

*Rationale for the Objective:* Habitat size is a required element of breeding habitat for many grassland bird species (Vickery et al. 1994). While few studies exist, habitat size is also believed essential to migrating and wintering grassland-dependent birds (Watts 2000). Many species of grassland birds are declining throughout their range due to habitat loss (Askins 1993); therefore, the refuge seeks to provide migrating and wintering grassland bird habitat where feasible. Grassland management will only occur where large contiguous grassland habitat can be established on the refuge without depleting existing shrub or forested habitat. Map 2-1 (page 2-8) depicts grassland management units.

**Strategies:***1-5 years*

1. Maintain existing grasslands (over the life of the plan) using a variety of techniques including mowing, prescribed burning, and discing.

2. Establish experimental plots in MU 1 to control invasive plants and evaluate the vegetative response to various treatment methods (e.g., mowing, discing, application of herbicides) prior to their widespread use. Monitor existing conditions prior to treatment.
3. Remove hedgerows between MUs 1 and 13 and autumn olive in MU 1.

*6-10 years*

4. Eradicate 20 percent of the existing Japanese honeysuckle population per year over a five-year period based on the results of Strategy 2 using invasive control measures such as mowing and the application of herbicides.
5. Eliminate 10 percent of the existing fennel population per year over a 10-year period using appropriate control techniques (e.g., deep discing, plowing, herbicides) based on the results of Strategy 2.
6. Eliminate the feral cat population on the Eastern Shore of Virginia Refuge. Refuge staff will live trap animals and transfer them to a shelter for adoption. Refuge staff will continue to manage the feral cat population as needed.

*11-15 years*

7. Continue to monitor and control invasives and manage for grasslands on MU 1 and 13.

## **GOAL 2: Maintain the long-term productivity, integrity, and function of the marsh, beach, and interdunal communities.**

### **Objective A: Beach Dynamics**



**Beach erosion.**  
*USFWS photo*

Maintain the natural dynamics of erosion and accretion of the beach community on Fisherman Island Refuge by allowing these coastal areas to grow and erode with passing storms and water currents.

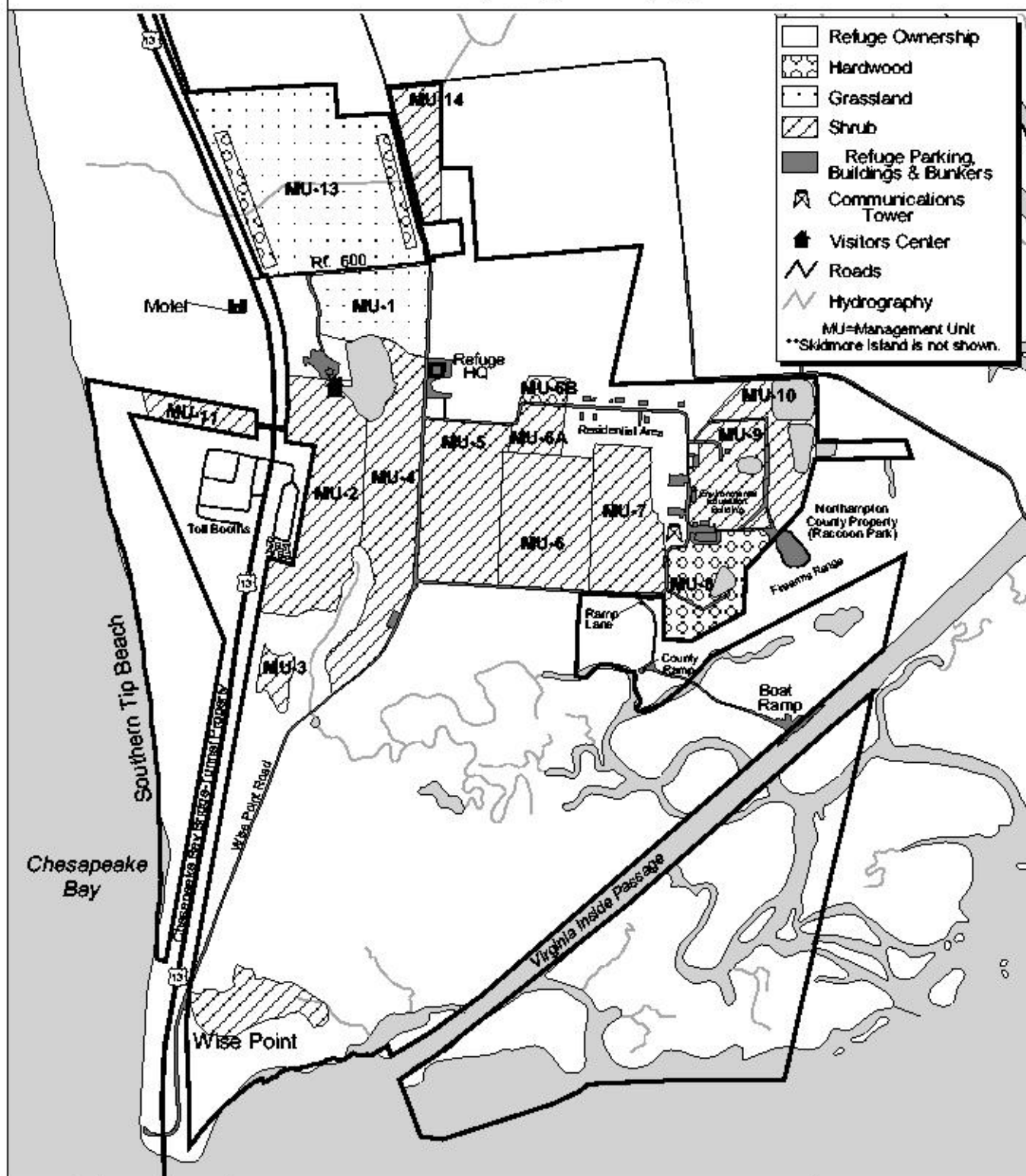
*Rationale for the Objective:* Fisherman Island is a dynamic mid-Atlantic coastal barrier island. Like many barrier islands, it consists of several dynamic habitats such as beach, dune, and tidally-influenced salt marsh. Accretion has led to significant increases in beach and foredune habitat on the north/northeast and south/southeast portions of the island. There have been similar increases in salt marsh habitat in the northern section of the island. Monitoring these habitats will show us the impacts to breeding productivity including the quality and quantity of available nesting habitat.

#### **Strategies:**

*1-15 years*

1. Monitor changes in island topography using aerial photos and research projects.
2. Monitor sand accretion and erosion on Fisherman Island at

# Habitat Management Eastern Shore of Virginia Refuge



Data Sources:  
1:24,000 Hydrography & 1:100,000 Road  
data provided by USGS with source dates  
of 1981 & 1989. All other data provided by  
USFWS. Projection/Date: UTM Zone 18,  
NAD 27, Meters.

Map prepared for the Eastern Shore of  
Virginia MWR & Fairham Island MWR  
Comprehensive Conservation Plan by the  
RS Cartography & Spatial Data Services  
Section, March 2000.

This map is for planning purposes only.

0 1000 2000 3000 4000 Feet

0 300 600 900 1200 Meters



- least every two years using accepted protocols.
3. Evaluate vegetation in royal tern nesting area; investigate the need to remove vegetation to enhance tern nesting habitat and deter nesting gulls.

### Objective B: Beach and Dune Habitats

Enhance the quality of nesting (e.g., royal tern, American oystercatcher) and migrating (e.g., sanderling) habitat on Fisherman Island Refuge by minimizing disturbance to beach-dependent birds and other wildlife from humans and predators.

*Rationale for the Objective:* Disturbance can lead to nest abandonment, chick mortality, and predation of nests and chicks during the breeding season (Burger 1991, 1994). Disturbance to staging areas during migration can lead to declines in shorebird abundance (Pfister et al. 1992).

#### Strategies:

##### *1-15 years*

1. Monitor human disturbance on Fisherman Island Refuge to verify adverse effects on avian nesting productivity and to minimize disturbance.
2. Continue to close Fisherman Island to public use during the nesting season (March 15 through September 30) with the exception of International Migratory Bird Day. Issue Special Use Permits to qualified researchers.
3. Focus interpretive and educational tours on Fisherman Island Refuge along the entrance road and within a quarter of a mile from where the entrance road reaches the beach.
4. Complete weekly avian surveys from Feb. 1 to May 31 to assess when breeding target birds (e.g., American oystercatchers, royal terns) are in the area. Complete bimonthly surveys the remainder of the year.
5. Conduct colonial nesting bird surveys for royal terns, sandwich terns, American oystercatchers, and others.
6. Conduct annual Christmas Bird Count on Fisherman Island.
7. Conduct volunteer beach cleanups on Fisherman Island and Eastern Shore of Virginia Refuges.
8. Update floral survey of Fisherman Island Refuge.
9. Install closure signs on Fisherman Island Refuge to inform boaters that the island is closed to the public. A Sign Plan will contain details of where the signs will be placed and what they will say.
10. Hire a law enforcement officer to educate the public about the sensitive nature of barrier islands and nesting bird colonies and to enforce area closures, particularly during the nesting season.
11. Monitor predator disturbance on Fisherman Island Refuge to determine adverse effects on avian nesting productivity.
12. Continue quarterly predator transect surveys on Fisherman



**Killdeer.**  
*USFWS photo*

**Raccoon.***USFWS photo*

- Island beaches and marshes to monitor mammalian predator activity.
13. Monitor colonial nesting bird sites each nesting season for the presence of mammalian predators, avian losses, and predator/prey relationships.
  14. Determine and evaluate productivity for the following species: brown pelican, royal tern, American oystercatcher, laughing gull, herring gull, and great black-backed gull.
  15. Implement a zero tolerance policy for red fox, coyote, and feral cats by immediately removing these predators using appropriate humane methods such as padded leg-hold traps and/or lethal means.
  16. Implement gull control measures if colonial or beach nesting bird numbers are in decline because of predation by, competition with, or displacement by gulls. We will assess the implementation of non-lethal control methods, such as harassment, before implementing lethal methods, such as destroying nests/eggs, adding eggs or killing adults.
  17. Implement mammalian predator (i.e., raccoon) control measures if colonial or beach nesting bird numbers are in decline because of predation.

### Objective C: Threatened and Endangered Species

Protect and maintain beach habitat on the refuges in an unimpaired condition for Federal-listed species and for other species and habitats of special concern.

*Rationale for objective:* Three listed species—Northeastern beach tiger beetle, piping plover, and seabeach amaranth—either occur or historically have occurred on the refuges. When State recovery plans become available, we will use them whenever practical to manage State-listed species found on the refuges.

### Northeastern Beach Tiger Beetle

The Northeastern beach tiger beetle is a Federal-listed species found on the southern tip beach of the Eastern Shore of Virginia Refuge. It is the only listed species suspected to reside on either of the refuges. The Sunset Beach Resort owns property abutting the southern tip beach. Cooperation with resort owners is necessary for the beetles' protection.

#### Strategies:

*1-5 years*

1. Monitor beach width annually on the southern tip beach to determine the beach habitat available for tiger beetles.
2. Survey adult tiger beetles between the end of June and the beginning of July to determine breeding population status.
3. Conduct weekly adult tiger beetle surveys for 3–5 years in the summertime, beginning in June, to look at fluctuations in populations.



4. Assess trespassing (e.g., number of people and type of activity) on the southern tip beach.
5. Coordinate with Sunset Beach Resort to protect the tiger beetle population on the refuge and to educate the public about tiger beetle life history requirements.
6. Install interpretive signs on the southern tip beach to provide information about tiger beetles.

#### *6-10 years*

7. Using genetic tests, determine which subspecies of Northeastern beach tiger beetle exists on the southern tip beach.
8. Depending on results from adult tiger beetle surveys, conduct tiger beetle larval surveys on the southern tip beach for a minimum of three years to determine if tiger beetles breed on the refuge.

### Piping Plover



**Piping plover.**  
*USFWS photo*

The piping plover was last recorded nesting on Fisherman Island in 1992. Reasons for absence of recent nesting activity may include the sparse and declining numbers of breeding birds in this portion of the species' range, sub-optimal (but moderately suitable) habitat, and deterrence of plover courtship activities by roosting herring and great black-backed gulls.

#### *1-5 years*

9. Conduct semi-weekly (twice a week) surveys of piping plovers during spring migration (approximately March to early May) and fall migration (August to mid-September) to determine the importance of the site for migration.
10. Conduct weekly surveys of breeding plovers in late May, June, and July.
11. Conduct semi-monthly (twice a month) surveys of piping plovers the rest of the year (October–February). Note locations of piping plover with Global Positioning System (GPS) and note micro-habitat characteristics to determine if patterns exist where plovers are observed foraging. Use this to determine and locate the best potential nesting areas. Report sightings of color-banded birds.
12. If plovers are found nesting on Fisherman Island Refuge, maximize potential production by providing intensive protection from predators.

#### *6-10 years*

13. Use GPS to map locations of nesting American oystercatchers on Fisherman Island Refuge to assist in determining potential sites for breeding piping plovers. (Oystercatchers and plovers use similar habitat.)

## Seabeach Amaranth

Seabeach amaranth was Federally listed as threatened in 1993 by the Service. An annual plant, the amaranth often grows in the same areas selected for nesting by shorebirds. Threats include beach stabilization efforts, intensive recreational use, and herbivory by webworms. The plant has historically occurred in Northampton County. More intense surveying is needed to ensure the plant's protection should it become established on Fisherman Island Refuge.

### *1-15 years*

14. Survey once a month, in July and August, for seabeach amaranth. Surveying can be completed from a vehicle.
15. If found, establish a 10-foot buffer of engineering tape or other type of obvious barrier around the plant to alert staff and researches of location so it is not damaged.

## Objective D: Tidally-Influenced Salt Marsh

Monitor and, where possible, preserve the quality and natural function of tidally-influenced salt marsh on the refuges for marsh-dependent birds (e.g., clapper rail, seaside sparrow) and other avian species.

*Rationale for the Objective:* Marsh and wading birds include species of regional and national management concern. Baseline data on the status of marsh and wading birds are needed for both refuges, including Skidmore Island. Data will be used to determine species presence, abundance, and distribution, and will aid in monitoring temporal impacts of salt marsh habitat changes (i.e., rise in sea level).

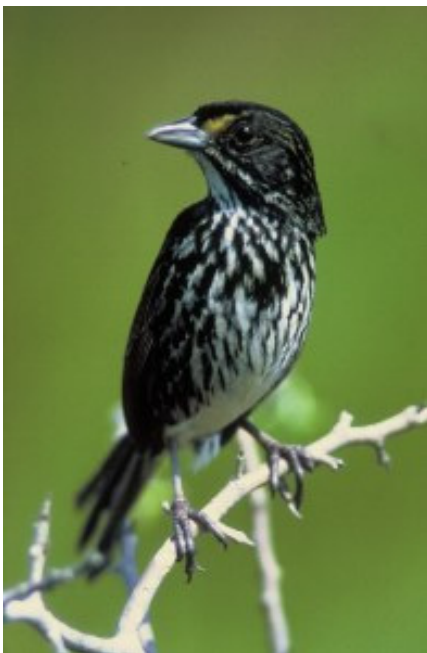
### Strategies:

#### *1-5 years*

1. Continue annual marsh breeding bird callback surveys according to Service protocol to assess use of salt marsh habitat by breeding birds.
2. Conduct an annual breeding bird survey of the heron rookeries.
3. Continue to conduct and expand regional marsh bird surveys.
4. Determine the extent of the phragmites invasion on both refuges through aerial photos and ground investigations.
5. Conduct baseline studies in the vicinity of the boat ramp related to marsh-dependent species, water quality, and habitats to monitor impacts of boat ramp.

#### *6-15 years:*

6. Control phragmites according to the Invasive Species Management Plan. This may include the use of herbicides in late summer and prescribed burning in late fall/early winter.



**Seaside sparrow.**  
*USFWS photo*



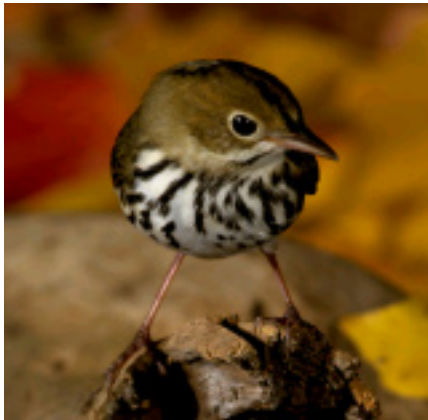
7. Continue surveys in Strategies 1–5.

**Goal 3: Actively participate in the conservation of healthy hardwood, under-story, and grassland habitat for neotropical and temperate migratory birds during future development throughout Northampton County.**

**Objective A: Protect Existing Forest/Shrub Migratory Bird Stopover Habitat**

Maintain unprotected forest and shrub habitat within the lower 10 km of the Delmarva Peninsula to reduce the rate of loss of stopover habitat for neotropical and temperate migrants.

*Rationale for the Objective:* Because of its geographic configuration, the lower Delmarva Peninsula provides important stopover habitat for large concentrations of migrant land birds. Studies have identified the highest priority lands as those within the southernmost 10-km of the peninsula, within a 1.5-km wide zone (10k zone) bordering bayside and seaside coastlines (Mabey et al. 1993, Watts and Mabey 1994). Due to this concentration effect and to rapidly increasing development pressures, protection or restoration of migration habitat of any size or configuration at the southern tip of the peninsula is critical. See the Land Protection Plan (Appendix E) for more details.



**The ovenbird is one of numerous Neotropical songbirds that utilizes refuge resources.**

*USFWS photo*

**Strategies:**

*1-5 years*

1. Continue to work with willing landowners to acquire lands within our 310-acre previously approved acquisition boundary.
2. Protect additional existing forest and shrub habitat through purchase of fee title or conservation easements within the 10k zone (see Appendix E). Lands will be acquired from willing sellers within the 6,030-acre expansion area (which includes the 310 acres described above). This area includes approximately 1,800 acres of forested habitat important to migrants. The area extends from the tip of the peninsula north along the bay to Plantation Creek and north along the seaside to Walls Landing Creek, and is bounded by Routes 600 on the east and 645 on the west. Much of the remaining forest occurs in low, wet riparian areas along creek drainages or on hydric soils too wet to farm, and is surrounded by farmland.
3. At the time of new acquisitions, the refuge manager will evaluate existing public uses and determine whether they are compatible. If no public uses have been established, new tracts will remain closed to public use until a formal compatibility determination has been completed.
4. Work with local realtors to monitor the availability of high-priority lands for purchase.
5. Coordinate Geographic Information System (GIS) analysis of the lower Eastern Shore with Northampton County

officials, The Nature Conservancy (TNC), State, and Service partners to further support cooperative land protection efforts on the lower Delmarva Peninsula.

6. Assist State, County, and private partners in obtaining grants to protect high-priority lands through a variety of land protection strategies (e.g., direct purchase, conservation easements).
7. Coordinate with the Northampton County Planning Commission, Accomack-Northampton Planning District Commission, and others to identify private lands within the County that are suitable for conservation easements.

#### *6-10 years*

8. Coordinate with partners to develop a training course on conservation easements for Refuge, State, and County employees.
9. Encourage and support the development of a land trust by local citizens to protect high-priority wildlife habitat in Northampton County.

### **Objective B: Acquire and Restore Agricultural Lands to Forest/Shrub Migratory Bird Stopover Habitat**

Acquire and restore agricultural lands to hardwood forest and shrub migration habitat in the lower 10-km of the Delmarva Peninsula to increase the availability of high-quality staging and stopover habitat for neotropical and temperate migrants. Consider native grassland restoration where large, contiguous tracts of this habitat type could be effectively managed over time.

*Rationale for the Objective:* Protecting more land on the Eastern Shore of Virginia will provide more wildlife habitat for a variety of species. The lower Delmarva Peninsula provides important stopover habitat for large concentrations of migrant land birds. Studies have identified the highest priority lands, which are reflected in over LPP. Due to this concentration effect and to rapidly increasing development pressures, protection or restoration of migration habitat of any size or configuration at the southern tip of the peninsula is critical.

#### **Strategies:**

##### *1-5 years*

1. Acquire and restore agricultural lands within the 6,030-acre expansion area (Appendix E) to hardwood forest and shrub habitat to widen/reconnect the vegetated migration corridor where possible. The project area includes approximately 3,315 acres of agricultural land, or about 55 percent of the total land area proposed for acquisition. Land will be acquired from willing sellers, as funding allows.
2. Work through our Partners for Wildlife Program and with other partners, such as the Natural Resources Conservation Service, to establish conservation easements



**Common yellowthroat, a Neotropical migrant.**  
*USFWS photo*

on agricultural lands not protected through acquisition within and outside the 6,030-acre expansion area. Focus particularly on restoration of vegetated riparian buffers along creek drainages and on marginal agricultural soils.

**Goal 4: Provide wildlife-dependent recreational opportunities and community outreach with an emphasis on educating the public about the critical role the Delmarva Peninsula serves for neotropical and temperate migratory birds and migrating monarch butterflies.**

**Objective A: Hunting Opportunities**

Offer safe, high-quality opportunities for archery and shotgun deer hunting on existing or new refuge lands to provide wildlife-dependent recreational opportunities and to enhance the quality of the understory for neotropical and temperate migrants.



**Bow hunter.**  
*USFWS photo*

*Rationale for the Objective:* Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use. Providing wildlife-dependent recreational opportunities like hunting helps foster an appreciation for wildlife. Also, studies have shown that an overabundance of deer can have a significant detrimental effect on the forest understory. Such habitat is of particular importance to neotropical and temperate migratory birds. A deer hunting program will help prevent serious habitat degradation of the forest understory.

**Strategies:**

*1-5 years*

1. Provide an annual deer hunt program for archery and shotgun in designated zones (see Map 2-2, page 2-23) of the Eastern Shore of Virginia Refuge during specific days of the fall and winter (23 hunters per day, 19 days total).
2. Promote hunting on the Eastern Shore of Virginia through participation in the annual National Hunting and Fishing Day.
3. Work with State and Federal partners to determine if the number of hunters per refuge hunt zone is within safe limits given the proximity of the hunt to refuge housing and public roads.
4. Work with State partners to modify the hunt program at Eastern Shore of Virginia Refuge to increase the take of deer. Evaluate season length, method, number of hunters and their distribution.
5. Work with State partners to assess the health of the deer population on Fisherman Island Refuge.
6. Open a portion of the former Wise Point Corporation property to deer hunting.
7. Provide waterfowl hunting opportunities by boat on a portion of the former Wise Point Corporation property. Waterfowl

hunt season dates and bag limits will fall within the parameters of the State's waterfowl season and will be administered in a way that will cause the least amount of disturbance to neotropical migratory birds. This may mean starting the season later, which may also mitigate conflicts between waterfowl hunting and other wildlife-dependent recreational activities.

*6-10 years*

8. Open a portion of Fisherman Island Refuge to an archery deer management hunt. A management hunt means that the hunt is conducted for biological reasons, such as when monitoring shows a significant decline in habitat quality due to over-browsing. Therefore it may not be conducted every year.
9. Allow deer and small game hunting on lands to be acquired, provided it will cause minimal disturbance to neotropical migratory species. Hunting will fall within the parameters of the State hunting seasons, and will be administered so as to minimize disturbance to neotropical migrants. Deer hunting will start after December 1. Hunting will be allowed only on forested tracts measuring 75 acres or more in size. No pursuit dogs will be allowed.
10. Allow waterfowl hunting on marsh blocks to be acquired that are 200 acres or larger. Most waterfowl hunting will occur on seaside marsh areas acquired. Waterfowl hunting on new lands will be subject to the conditions mentioned in Strategy 7 above.

### Objective B: Boating and Fishing Access

Accommodate the needs of commercial watermen and recreational anglers and boaters by providing deep water access to fishing and hunting grounds on the Atlantic Ocean and Chesapeake Bay.



**Wise Point Boat Ramp 2002.**

*USFWS photo*

*Rationale for the Objective:* The Wise Point boat ramp is located on the deep waters of the Virginia Inside Passage which was constructed in the 1950's and bisects the refuge. Despite miles of shoreline in Northampton County, public deep water access is very limited. There are six public boat access points in the county (not including Wise Point), with the closest ramp on the Atlantic Ocean located 10 miles north (Oyster). The closest public ramp on the Chesapeake Bay is 3.5 miles away (Kiptopeke State Park). Both of these ramps are used beyond capacity during certain summer days and other popular fishing times. Additionally, the Wise Point site is ideal because of its proximity to the Chesapeake Bay Bridge Tunnel, a popular fishing location. The ramp location also affords a relatively safe harbor because of the islands and marshes to the east which provide protection to boaters during storms and high winds.

There was limited use of the boat ramp by recreational and commercial users before the area became part of the refuge.



**Black-crowned night-heron**

*USFWS photo*

Because of both the demand for boat launching in the County and the limited supply of suitable sites, there is an expectation that this site will be available to the public. Additionally, there were 21 commercial watermen paying for and using this site on a commercial basis when the area became refuge land. Many of these commercial watermen have Commonwealth-leased grounds and permits for locations in close proximity to the Wise Point ramp. These watermen have a vested interest in gaining access that is proximate to their established work sites.

Northampton County, which has little revenue from industrial and manufacturing businesses, is trying to balance the desire to maintain its rural atmosphere with its fiscal needs. The Wise Point boat ramp will bring dollars to the County through ecotourism, use by recreational boaters, and through commercial watermen in the form of job opportunities, taxation on commercial catch, and purchase of fuel, food, and lodging.

#### Strategies:

##### *1-5 years*

1. Conduct baseline studies in the vicinity of the boat ramp related to marsh-dependent species, water quality, and habitats.
2. Secure a right-of-way agreement with Northampton County for passage through Raccoon Park.
3. Improve and widen the entrance road and improve and enlarge the parking lot. Cap parking at 75 spaces, reserving 12 spaces for commercial watermen.
4. Construct a two-lane boat ramp, commercial dock, and a commercial off-loading site. Provide support facilities such as restrooms, lighting, an electric gate, signage, and overflow/satellite parking if needed to reach 75 parking spaces.
5. Minimize impact to permitted commercial watermen by allowing access during construction as much as possible.
6. Once improvements are made, open the ramp daily to recreational anglers and boaters and commercial watermen during normal refuge hours (half an hour before sunrise to half an hour after sunset) with extended hours during certain seasons. Open the ramp for 24-hour access to a limited number of permitted commercial watermen that were using the area on a commercial basis and paying a commercial rate at the time of Service purchase (Dec. 26, 2001). The refuge may be closed at certain times (e.g., during a gun hunt or prescribed burning), impacting access to the boat ramp at those times.
7. Charge \$10 for recreational day-use permits and \$120 for an annual recreational pass (rates will change with inflation). Users that were commercially using the area and paying a commercial rate when the Service purchased the site will pay an annual fee of \$1,500 for those who dock their boats and \$600 for those who do not dock their boats (no new docking privileges will be granted). New commercial users



and commercial users that were not paying a commercial fee when the Service purchased the property will be allowed to use the site commercially and will be charged \$400 annually. These new commercial users will not be granted use of the docks, reserved parking, nor 24-hour, 7 days-a-week access. However, they will be allowed to use the off-loading area for commercial catch.

8. Boat docking will be phased out over time. Once the commercial watermen (those that met certain criteria when the land was purchased) retire or terminate commercial fishing from this site, their docking rights will be relinquished. However, their other special rights (24-hour access, reserved parking) may be passed on to one heir who is a named individual (not a business) and is actively participating in commercial fisheries from the site. All special rights terminate after the second generation.
9. If annual, commercial special use permit fees are not paid according to permit schedule, and/or if the special use permittee violates any permit conditions, then permit privileges will be permanently revoked.
10. Cap the number of canoes and kayaks to two per vehicle; any vehicle with more than two kayaks must obtain a Special Use Permit.
11. After improvements are completed, contract with a concessionaire to manage the site. If no concessionaire is found, manage the site through the refuge fee program.
12. Do not allow pets in the boat ramp area.
13. Do not allow personal watercrafts (PWCs) to launch from the boat ramp.
14. Partner with the State to extend the no-wake zone in the Virginia Inside Passage, adjacent to the refuge.
15. Provide opportunities for shoreline and other fishing on newly acquired lands, provided that such opportunities would not harm or harass tiger beetle populations.



**Refuges are home to beautiful birds to photograph, such as this snowy egret.**

*USFWS photo*

### **Objective C: Wildlife Observation and Photography**

Expand opportunities on the Eastern Shore of Virginia Refuge and maintain those existing on Fisherman Island Refuge, for visitors to engage on wildlife viewing and nature photography along trails and existing roads.

*Rationale for the Objective:* Wildlife observation and photography are identified in the National Wildlife Refuge System Improvement Act of 1997 as priority public uses. Providing increase opportunities for the public to participate in these activities on the refuge promotes visitor appreciation and support for refuge programs as well as habitat conservation efforts on the southern tip of the Delmarva Peninsula.





**Photo blind located on entrance road where birds and other wildlife may be observed.**

*USFWS photo*

#### Strategies:

##### *1-5 years*

1. Continue to offer only guided tours of Fisherman Island Refuge on weekends from October 1 through March 15.
2. Maintain the photo blind on Eastern Shore of Virginia Refuge.
3. Continue to provide an observation window in the Visitor Center overlooking a freshwater pond. Annually remove invasive cattail in the pond to enhance viewing from the observation window.
4. Maintain two overlooks along 1.5 miles of trails on the Eastern Shore of Virginia Refuge.
5. Maintain the butterfly garden adjacent to the Visitor Center with native nectar-producing shrubs and forbs to provide food sources for butterflies and wildlife observation opportunities for visitors.
6. Construct 0.6 mile trail which will allow additional public, pedestrian access for wildlife observation and photography. The new trail will run along the Wise Point Road and then extend to the salt marsh, where we will construct a 200-foot boardwalk, an overlook, and an associated interpretive panel. There will be limited access (i.e., tours) to the trail during fall migration to curb disturbance to migratory species.
7. Establish a 0.2-acre butterfly garden at the refuge office and initiate a volunteer "Adopt-a-Garden" program to ensure that refuge butterfly gardens are maintained.
8. Conduct weekly butterfly walks in October to educate visitors about the monarch migration.
9. Establish links on photography websites to promote the refuge as a good place to view and photograph wildlife, particularly neotropical and temperate migratory birds during the fall migration.

##### *6-10 years*

10. Conduct an annual photography workshop incorporating both classroom and field activities that focuses on refuge wildlife, particularly neotropical and temperate migrants.
11. Promote wildlife viewing and photography on the refuge website by posting a series of new photographs and species information monthly.
12. Establish a 0.2-acre butterfly garden at the wildlife trail parking lot.
13. Provide opportunities for wildlife observation and photography on newly acquired lands wherever those opportunities will least disturb migratory species. We will provide between three and six new trails if we acquire all 6,030 acres on the lower Delmarva Peninsula. There will be at least one, but no more than two, trails on each the bayside, the southern tip, and the seaside of the Delmarva Peninsula. At least one trail on the bayside will have beach access, if it does not adversely affect tiger beetles.

## Objective D: Environmental Education

Focus 85 percent of the content of educational programs on the importance of the Eastern Shore of Virginia Refuge to forest and shrub-dependent neotropical and temperate migrants to promote awareness among Northampton County students and other program participants of the refuge's role in the conservation of migratory birds and their habitats.



**Refuge intern teaching a first grade class.**

*USFWS photo*

*Rationale for the Objective:* Environmental education is identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use. It also serves as a valuable tool in the protection of our nation's wildlife and habitat resources. Educating young people about wildlife conservation fosters an appreciation of the important role the refuge plays in support of these efforts and hopefully motivates individuals to make responsible environmental decisions in the future.

### Strategies:

#### *1-5 years*

1. Develop three lesson plans focusing on neotropical and temperate migrants and following State Standards of Learning guidelines.
2. Conduct environmental education (EE) programs for Northampton County elementary school children (kindergarten through fifth-grade) and provide programs for other schools when possible.
3. Educate all third graders in Northampton County about migrating monarch butterflies and familiarize them with the "Monarch Watch" program and website.
4. Develop four interpretive programs for summer day camps from both the Eastern Shore and Hampton Roads areas that focus on the importance of the refuge to neotropical and temperate migrants.
5. Work with partners to develop and conduct one environmental education program per year that is taught in Spanish and aimed at educating the Eastern Shore's Hispanic population about local conservation issues, emphasizing the importance of the refuge to neotropical and temperate migrants.
6. Continue to offer the Junior Refuge Manager Program to interested youth, and develop an additional Junior Refuge Manager Program that targets fifth-to seventh-graders and emphasizes habitats important to neotropical and temperate migrants.
7. Continue to participate in the regional high school Envirothon.
8. Continue to conduct a seasonal woodcock educational programs when possible.

#### *6-10 years*

9. Annually conduct an on-site teacher workshop that focuses on fall migration, and do feedback questionnaires to help

refine programs to best meet teachers' needs. Develop workshops in conjunction with an accredited university so teachers can obtain continuing education units.

10. "Adopt" a class at Kiptopeke Elementary School. This will include developing a series of environmental education programs for a specific class throughout the school year that focuses on the refuge and its importance to neotropical and temperate migrants.
11. Work with local partners like The Nature Conservancy (TNC), Kiptopeke State Park and the Barrier Island Museum to support an annual Elderhostel program focusing on improving habitat for neotropical and temperate migrants.
12. Develop lesson plans on migration that can be used by teachers in the classroom.

#### *11-15 years*

13. Design and construct an outdoor environmental study area consisting of a half-mile trail, three teaching stations, and a pavilion to educate students from the Delmarva Peninsula and nearby areas on the importance of the refuge to neotropical and temperate migrants.
14. Renovate a building to include a wet lab, indoor classrooms, hands-on exhibits, and teacher resource library.

#### **Objective E: Wildlife Interpretation**

Promote awareness among refuge visitors and residents of the lower Delmarva Peninsula regarding the refuge's role in the conservation of migratory birds and their habitats. Focus 85 percent of interpretive materials, signs, and exhibits on the importance of the Eastern Shore of Virginia Refuge to forest and shrub-dependent neotropical and temperate migrants.

*Rationale for the Objective:* Providing the public with a wide variety of interpretive information about neotropical and temperate migrants will greatly increase public understanding and support for habitat protection efforts on the southern tip of the Delmarva Peninsula. Additionally, wildlife interpretation is identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use.

#### **Strategies:**

##### *1-5 years*

1. Continue to offer visitors a modern, interactive, and educational Visitor's Center with video presentations, various exhibits, talks, and programs to enhance their Refuge experience.
2. Create a diorama for the Visitor Center that depicts the important neotropical and temperate migrant habitats on the lower eastern shore and the species associated with them.
3. Revise refuge brochure and website to focus more attention on the importance of the refuge to neotropical and temperate migrants.



**The whale skull and the touch table exhibit at the refuge visitor center.**

*USFWS photo*



**Northern saw-whet owl.**

*Fran Saenz*

4. Develop two permanent interpretive displays for the wildlife trail kiosk that focus on the refuge as a staging area for neotropical and temperate migrants.
5. Continue to provide 1.5 miles of trails with a kiosk and interpretive signs.
6. Continue to conduct special tours and programs on request (e.g. Scouts, birding clubs, garden clubs).
7. Continue to coordinate with the Chesapeake Bay Bridge Tunnel (Bridge-Tunnel) Authority to display interpretive material on the bridge.
8. Develop a portable/traveling exhibit that emphasizes the importance of the refuge to neotropical and temperate migrants. The exhibit will be used for off-refuge festivals, events and public meetings.
9. Work with partners (e.g. Coastal Virginia Wildlife Observatory) to enhance and expand, from March to May, interpretive migratory bird programs for the general public and students.
10. Install a camera at an active osprey nest platform and broadcast the image on a monitor at the Visitor Center. Place pictures from the camera on the refuge website.

*6-10 years*

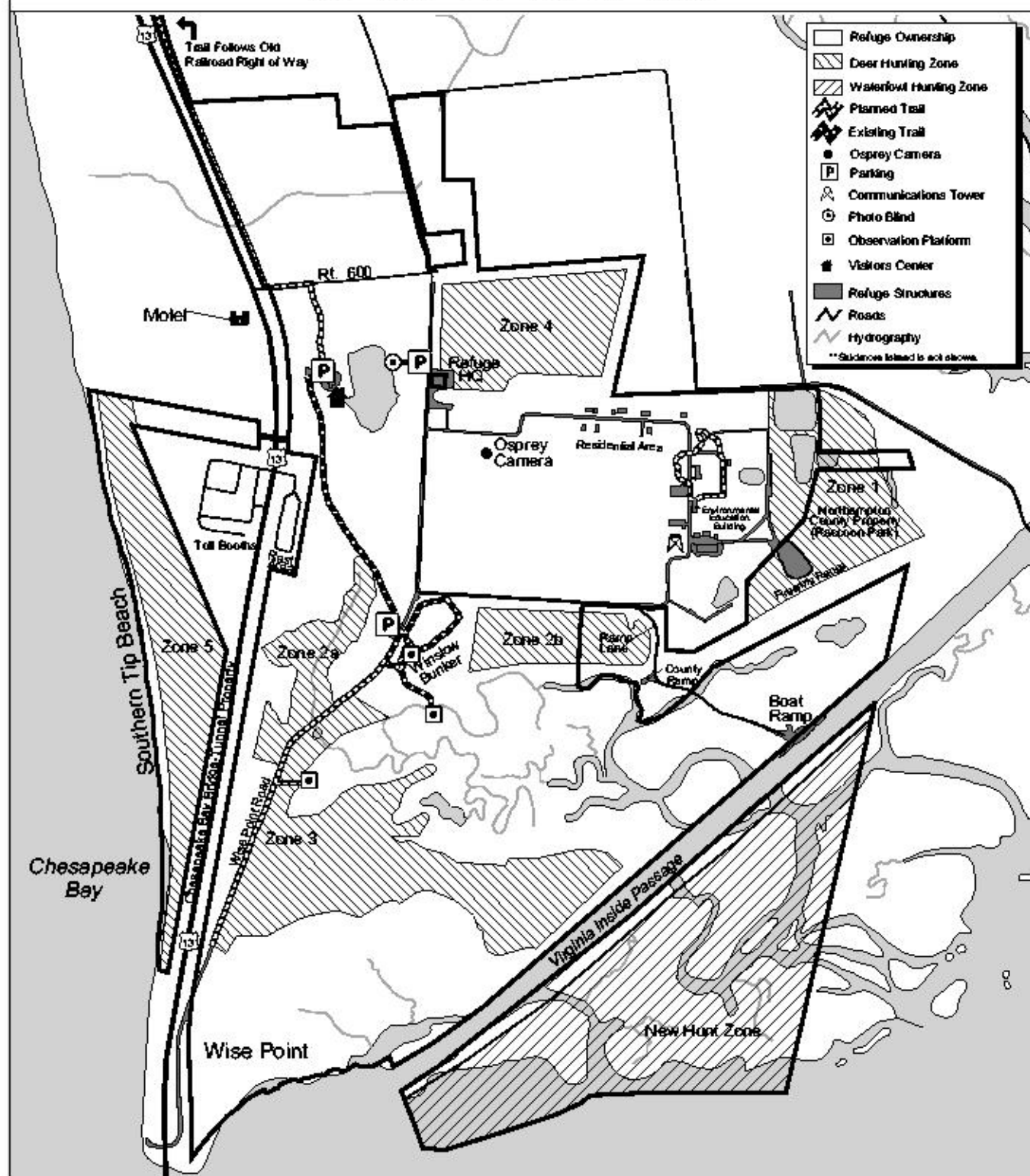
11. Design interpretive trail signs to address the importance of the refuge to neotropical and temperate migrants.
12. Conduct a monthly fall interpretive walk that focuses on neotropical and temperate migratory bird identification and habitat needs.
13. Conduct a monthly interpretive program (e.g., “owl hoots”) in the late fall during evening hours that focuses on field identification of owls.

*11-15 years*

14. Produce an interpretive video that describes hardwood and understory management, with an emphasis on habitat management practices that benefit neotropical and temperate migrants. The video will become a part of the management video in the Visitor Center and can also be used in talks to the public.
15. Provide interpretive signs along trails on newly acquired property. Signs on bayside trails can interpret the importance of the beach to the Northeastern beach tiger beetle; signs on the southern tip can interpret the importance of the area to neotropical migrants; signs on the seaside can interpret the importance of the salt marsh to water birds.



# Public Use Opportunities Eastern Shore of Virginia Refuge



**Data Sources:**  
1:24,000 Hydrography & 1:100,000 Road data provided by USGS with source data of 1981 & 1989. All other data provided by USFWS. Projection/Datum: UTM Zone 18, NAD 83, Meters.

Map prepared for the Eastern Shore of Virginia NWR & Fisheries Island NWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section, March 2003.

This map is for planning purposes only.

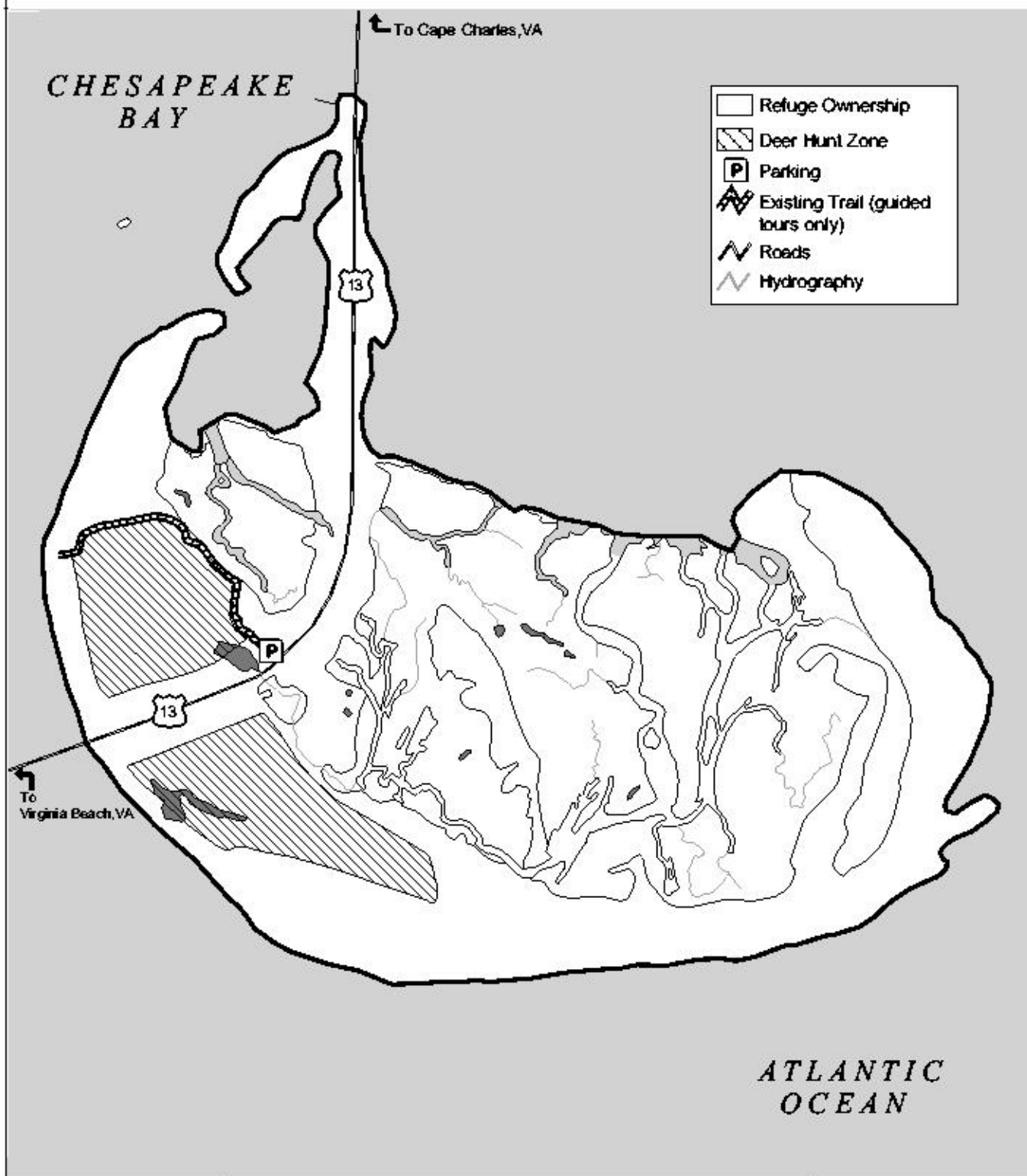
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# Public Use Opportunities Fisherman Island Refuge



**Data Sources:**  
1:24,000 Hydrography & 1:100,000 Road data provided by USGS with source dates of 1981 & 1989. All other data provided by USFWS. Projection/Datum: UTM Zone 18, NAD 83, Meters.

Map prepared for the Eastern Shore of Virginia NWR & Fisherman Island NWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section, March 2003.

This map is for planning purposes only.

0 1000 2000 3000 4000 Feet



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**GOAL 5: Integrate the refuges into the larger community of the eastern shore and promote awareness of the unique value of the lower Delmarva Peninsula to neotropical and temperate migratory birds and migrating monarch butterflies.**

**Objective A: Encourage Responsible Nature-Based Tourism**

Communicate to the local service industry (e.g., tourism guides; employees of hotels, bed and breakfasts, restaurants) the ecological importance of the Eastern Shore of Virginia and Fisherman Island Refuges and encourage the use of responsible resource stewardship practices to promote the lower Delmarva Peninsula as a nature-based tourism destination.

*Rationale for the Objective:* Working with partners to draw attention to the importance of the refuge and surrounding lands as critical stopover and staging habitat for neotropical and temperate migrants will generate a broad base of support for habitat conservation efforts in the lower Delmarva Peninsula. Tour guides will be taught how to minimize the impacts of their activities so that they can showcase the area's natural resources without adversely affecting wildlife or its habitats. Increased nature-based tourism will also provide additional recreational opportunities for visitors and economic benefits to the local community.

**Strategies:**

*1-5 years*



**Eastern Shore of Virginia Birding Festival.**

*Chamber of Commerce website*

1. Co-sponsor and participate in local festivals and events to promote nature-based tourism on the lower Eastern Shore. Major events include Eastern Shore of Virginia Birding Festival, International Migratory Bird Day, National Wildlife Refuge Week, National Hunting and Fishing Day, Earth Day, Chesapeake Bay Bridge Tunnel Walk/Bike Day, and Citizens for a Better Eastern Shore Biking Day.
2. Continue cooperative efforts with conservation groups to promote nature-based tourism in the area by, for example, helping to develop visitor guides such as the Delmarva Birding Guide and the Audubon Guide for Refuges.
3. Continue to educate tour guides on refuge regulations and the fragility of Fisherman Island Refuge's habitats and nesting colonies, especially as kayaking increases in popularity on the lower Delmarva Peninsula.
4. Support the Coastal Virginia Birding Trail by developing an interpretive site on the refuge and promoting other coastal sites on the refuge website.
5. Work with universities and agencies that are developing courses for commercial tour guides which focus on minimizing the environmental impacts of nature-based tourism. The Virginia Coastal Program, through its Seaside Heritage Program, is offering an Ecotour Guide Certification Course, and is funding the Virginia Institute of

Marine Science to create a teacher certification course in 2004.

6. Under the Seaside Heritage Program, the Virginia Coastal Program is working to develop a Seaside Canoe/Kayak Water Trail. Work with these and other partners developing kayaking trails in the Eastern Shore area.

*6-10 years*

7. Establish closer relationships with the local business community to promote responsible nature-based tourism. This includes educating tour guides about the area's sensitive natural resources and encouraging responsible behavior around sensitive wildlife habitats and populations with emphasis on neotropical and temperate migrants.

*11-15 years*

8. Work with partners (e.g., Chamber of Commerce, Citizens for a Better Eastern Shore, bed and breakfasts, local restaurants) to develop nature-based tourism "packages" (lodging, transportation, meals) that highlight refuge resources through organized tours and workshops.
9. Work with the Bridge-Tunnel Authority to develop and install four new interpretive signs on the bridge islands, overlook, and rest areas. The signs will focus on neotropical and temperate migrants.
10. Develop a three-mile bike trail with two interpretive panels that focus on the importance of the lower Delmarva Peninsula to neotropical and temperate migrants.

**Objective B: Increase Refuge Recognition and Support**

Increase efforts to build recognition and support for the refuge by improving communication with local and national constituents and the interested public (e.g., Congress, conservation organizations, local communities, news media, and corporations).

*Rationale for the objective:* Fostering relationships with community leaders, local politicians, and the news media will strengthen support for the refuge and its programs. Special events improve community relations and awareness, as well as provide benefits to the local economy. Volunteer efforts and establishment of a Friends Group will help broaden refuge support in neighboring communities.

**Strategies:**

*1-5 years*

1. Offer outreach programs to civic groups such as local Garden Clubs, senior citizen groups, and Rotary Clubs.
2. Serve as an advisor for the Coastal Virginia Wildlife Observatory (CVWO), a non-profit environmental organization that contributes to migratory bird and butterfly research conducted on the lower eastern shore.
3. Maintain cooperative management efforts with Kiptopeke State Park, resulting in contributions to our respective



**Scarlet tanager.**  
*USFWS photo*

4. long-term management plans.
4. Continue to share refuge facilities (e.g., conference building) with Federal, State, and local agencies such as the Cape Charles Town Council, Kiptopeke State Park, Natural Resource Conservation Service, and the County Sheriff's Department to promote interagency coordination.
5. Maintain the refuge website to promote interest in the refuge. Information for visitors, volunteers, interns, and Workampers is available with such listings as a special event calendar, featured species of the month, rare sightings, historical information, and more.
6. Institute an annual field workshop for government and non-government partners that focuses on wildlife management issues on the refuge, with emphasis on forest and shrub-dependent neotropical and temperate migrants.
7. In cooperation with partners (e.g., Northampton County Chamber of Commerce, State agencies, and private landowners), continue planning International Migratory Bird Day activities on the refuge and work together on other special events (e.g., Birding Festival).
8. Form a refuge Friends Group to work both on and off the refuge. Off-refuge work will focus on developing partnerships in the local community and educating local landowners about Service land protection programs. Refuge staff will partner with the National Wildlife Refuge Association to train, mentor, support, and expand this new Friends Group.
9. Meet with Congressional representatives at least annually to provide an update on refuge operations and programs.
10. Increase efforts to invite television, newspaper, radio, and other media to major refuge events throughout the year (e.g., International Migratory Bird Day, Birding Festival, National Wildlife Refuge Week, etc.).

#### *6-10 years*

11. Work cooperatively with the Audubon "Refuge Keepers" program and/or other local environmental organizations to establish a vibrant volunteer corps to promote community stewardship of the refuge and increase public understanding of local conservation issues. This new group will also assist with expansion of corporate partnerships to increase financial support of refuge programs.
12. Conduct a tour of the refuge during the fall Harvest Festival that emphasizes the importance of the eastern shore to neotropical and temperate migrants.
13. Provide refuge information to participants of the Virginia State Fair and similar events emphasizing the important role the refuge serves for neotropical and temperate migrants.
14. In conjunction with partners, expand corporate sponsorship of refuge-related events such as International Migratory Bird Day, National Wildlife Refuge Week, and National Fishing Week.

### Objective C: Deliver a Conservation Message

Deliver a conservation message to those involved in land use and development. The message will emphasize practices beneficial to forest and shrub-dependent neotropical and temperate migrants.

*Rationale for the Objective:* This objective is aimed at raising the ecological awareness of those individuals actively involved in local land use and development such as building contractors, agricultural extension agents, and local nurseries. It will also encourage landowners to improve the habitat value of their property for neotropical and temperate migrants. Successful achievement of the objective will foster a broader base of support for the refuge and resource conservation efforts on the lower Delmarva Peninsula.

#### Strategies:

##### *1-5 years*

1. Work with cooperating organizations (e.g., local nurseries, garden clubs, agricultural extension office) to educate landowners on how to improve the value of their property as habitat for neotropical and temperate migrants.

##### *6-10 years*

2. Develop a demonstration plot on the refuge to educate homeowners about landscape practices that benefit neotropical and temperate migrants.
3. Coordinate with a local garden club to highlight “wildlife friendly” landscape practices on one to three homes in the County, focusing on the benefits to neotropical and temperate migrants.

##### *11-15 years*

4. Develop a program to certify building contractors as “wildlife friendly” in their practices so contractors can market this attribute to potential customers.
5. Work with the National Wildlife Federation to promote its backyard wildlife habitat program that educates homeowners about “wildlife friendly” land use practices they can undertake on their property.
6. Develop and promote, in conjunction with the local Chamber of Commerce, a garden tour focusing on fall nectar-producing flowers and stressing the important role the eastern shore plays for migrating monarch butterflies.
7. Develop a brochure for local residents regarding the importance, care, and maintenance of landscaping with native nectar-producing plants.
8. Work with private landowners to create five demonstration gardens in Northampton County to teach local residents first-hand how to develop their own butterfly gardens using native nectar-producing plants.



**Objective D: Assess Economic Impact of Nature-Based Tourism**

To foster support for the refuge and its programs in nearby communities, deliver a positive message to area businesses and residents of Northampton County regarding the impact that the refuge and its visitors have on the local economy.

*Rationale for the Objective:* Community leaders, business owners, and local residents will better understand how the refuge and nature-based tourism benefit the local economy and help maintain the quality of life in Northampton County.

**Strategies:**

*6-10 years*

1. In partnership with the local community, assess the economic benefits of the migratory bird resource to Northampton County.
2. Using the publication *Banking on Nature* and similar resources, promote to the local community the economic contribution of the refuge to Northampton County.

**Goal 6: Enhance and restore the quality of the soils, waters, and other abiotic components of the refuge landscape.**

**Objective A: Contaminants**

Determine the extent of contamination, if any, on existing refuge lands known or suspected to be contaminated, and the effects of that contamination on wildlife and plants. In addition, survey any lands to be acquired for potential contaminants.

*Rationale for the Objective:* A 1998 report (U.S. Environmental Protection Agency) was prepared to document levels of contaminants in ground water, surface water, soils, and sediments on the Eastern Shore of Virginia Refuge. However, sampling was limited in design and results indicate that at several locations organochlorine (pesticide) contamination may be impacting plants and animals. Since the extent of contamination is not adequately described by the sampling conducted for the 1998 report and the results are not adequate to evaluate the risk to plants and animals, the Service recommends more thorough sampling.

**Strategies:**

*1-5 years*

1. Interview former military personnel to identify sites of possible contamination.
2. Conduct contaminant surveys on existing refuge properties and on properties identified for acquisition.
3. Remove underground storage tanks and inspect above-ground storage tanks. Follow precautionary measures such as spill prevention and adequate containment.

4. Correctly store and/or dispose of hazardous materials such as flammables and pesticides. Inspect structures for asbestos.
5. For heavy metals and organochlorine pesticides, work with Northampton County to conduct thorough sampling of sediments and surface waters of the firearms range and the wetlands beyond it, Raccoon Creek and its drainages, and groundwater flow from the former landfill and sewage lagoons.
6. Work with the Service's Virginia Field Office to establish and implement the baseline biological sampling that was recommended in the Contaminant Assessment Process (CAP) for Eastern Shore of Virginia (1999) and Fisherman Island (2000) NWRs.



**County firearms range.**

*Susan Rice*

#### **Objective B: Firearms Range**

While operating the firearms range in the best interest of the refuge and law enforcement user groups, work with Northampton County to monitor impacts of spent ammunition on wildlife habitat.

*Rationale for the Objective:* Although the firearms range has safety berms on three sides, it is not lined to prevent leachate from percolating the soil or assisting in future contaminant isolation and cleanup. All actions will include close cooperation with Northampton County (the land owner).

#### **Strategies:**

*1-5 years*

1. Continue to work with partners (e.g., Northampton County, local law enforcement agencies) to find an alternate site for the firearms range (off-refuge) in a less environmentally sensitive location. Consider acquiring the land now occupied by the firearms range, land which lies within the original acquisition boundary.
2. Continue to administer and maintain the firearms range. Restrict use to law enforcement personnel from Northampton and Accomack counties. Schedule usage so as not to conflict with environmental education programs.
3. Continue to collect and recycle spent brass casings.
4. Conduct media sampling beyond the firearms range berm to evaluate ecological risk to biotic elements.
5. Design and implement engineering mechanisms to control surface runoff and leachate.
6. Implement current practices for firearms range management such as periodic removal of contaminated soils.

#### **Objective C: Contingency Planning for Oil and Hazardous Material Spills**

Assist with protecting the environmental quality of the lower Delmarva Peninsula by serving as an active participant in contingency planning and response to oil and hazardous material

spills in the Atlantic Ocean and Chesapeake Bay.

*Rationale for the Objective:* Due to geographic location, the southern Delmarva Peninsula and its surrounding salt marshes are especially vulnerable to threats from oil and hazardous material spills. Time and planning are critical factors for mitigating spill impacts on the Eastern Shore of Virginia and Fisherman Island Refuges.

*1-5 years*

1. Annually update spill and pollution prevention plans.
2. Maintain close communication and coordination with the Bridge-Tunnel Authority to achieve early spill notification.
3. Maintain close communication with the spill response coordinator at Chincoteague National Wildlife Refuge.
4. Provide the Bridge-Tunnel Authority with current sensitive area maps of both refuges and familiarize them with access points for deploying spill control equipment.
5. Encourage the Bridge-Tunnel Authority's participation in the Mid-Atlantic Coastal Area Planning Committee for spill response, control, and prevention purposes.
6. Provide spill response training for refuge staff.
7. Ensure that staff are familiar with the Service's spill response chain of command in Virginia and on the Delmarva Peninsula.

*6-10 years*

8. With the Service's Field Response Coordinator, explore with the U.S. Coast Guard and the Mid-Atlantic Coastal Area Planning Committee the idea of conducting a mock spill drill in the area of the southern Delmarva Peninsula.



**Communications tower.**

*Susan Rice*

**Objective D: Artificial Structures**

Promote a more natural appearance to refuge landscapes and increase the amount of acreage available as wildlife habitat by removing unnecessary artificial structures that obstruct views, occupy space, and in some cases constitute direct hazards to wildlife.

*Rationale for the Objective:* Artificial structures are often considered merely aesthetic or visual problems. There are, however, many ecological reasons for their removal. Communications towers are known hazards to birds. Unoccupied buildings become shelters for rats and raccoons and other predators. Roadways create ecological edge communities that concentrate a diversity of plant species, many of which are invasive. Artificial impoundments create aquatic systems that alter natural biodiversity. Furthermore, the cumulative space occupied by such structures is considerable, and cuts down on available wildlife habitat. Structures that require maintenance from non-refuge staff are best located on the perimeter of the refuge to assist in the

operation of the site and to enhance the security of refuge facilities.

**Strategies:**

*1-5 years*

1. Remove the old water tower in the maintenance area, taking precautions regarding the presence of lead-based paint.
2. Verizon Virginia, Inc. will remove the communications tower once the lease on that structure expires in 2007. We will work with Verizon to remove or relocate the switching station.
3. We will coordinate with the appropriate authorities to ensure that Formerly Used Defense Sites (FUDS) are secure and do not pose a safety hazard before we allow unrestricted access in their vicinity.



**American oystercatcher.**

*AJ Hand*

## General Refuge Management

### Baseline Inventories

The need for baseline information on National Wildlife Refuges has become urgent as more and more species are lost to extinction (Defenders of Wildlife 1998). Without the knowledge of the status, trends, and responses to management of biological systems, refuges cannot be effectively managed for the conservation of fish, wildlife, and plants. The development of systematic species and habitat monitoring is recommended in the “Fulfilling the Promises” document (USFWS 1999a) which lays out a vision for the National Wildlife Refuge System. Standardized Region 5 surveys call for conducting annual surveys for breeding birds, grassland birds, marsh birds, frogs and toads. In addition to the standardized Region 5 surveys, we will use peer-reviewed protocols to collect baseline and trend data on vascular plants, vertebrates, invertebrates, threatened and endangered species, and trust resources on the Eastern Shore of Virginia (including Skidmore Island) and Fisherman Island Refuges.

### Protecting and Managing Cultural Resources

By law we must consider the effects of our actions on archeological and historic resources. We will comply with Section 106 of the National Historic Preservation Act, which requires that “earth moving” projects (projects that require breaking ground) be reviewed for archeological resources prior to commencement. Compliance may require a State Historic Preservation Records survey, literature survey, or field survey.

The Service will consult with the Virginia Department of Historic Resources (Virginia’s State Historic Preservation Office) in evaluating the National Register eligibility of farmstead buildings and associated historic and archaeological sites. Management

alternatives for the buildings will be developed after their eligibility has been determined. Options include documenting and demolishing them, moving them for reuse by another organization, or rehabilitating and adaptively reusing them for refuge or partner purposes. The refuge will also initiate a structural engineering review of the Winslow Bunker (Battery 12) on Eastern Shore of Virginia Refuge and install a more effective gate system at that site.

In 2000, the refuge's museum property intern and Outdoor Recreation Planner drafted revisions to the refuge's Scope of Collection Statement. This document is intended to guide the refuge in the future acquisition and management of appropriate museum property. The refuge will review and adopt a version of this draft as its current Scope of Collection Statement. In addition, the refuge will continue to implement report recommendations about improving the environment of the Environmental Education Building or creating an alternative modular storage area for the collection. Other actions to be taken with museum property are:

- Appraise the refuge's decoys and historic objects.
- Address any pest infestation of the refuge's mounted specimens and decoys.
- Clean mounted zoological specimens.
- Maintain the refuge's scientifically valuable wet specimens.
- Prepare and implement housekeeping, pest management, and environmental monitoring plans.
- Catalog and label remaining uncataloged documents and historic objects.
- Inspect archaeological artifacts belonging to the refuge but located at the Virginia Department of Historic Resources.

### Wilderness Review

The final refuge planning policy published May 25, 2000 requires that a wilderness review be conducted concurrently with the CCP process. However, since this CCP was in preparation prior to the finalization of the planning policy, a wilderness review has not yet been completed. A site visit to assess wilderness characteristics of both refuges was accomplished in 1999. When examining Fisherman Island Refuge, we discussed the need to further evaluate the impacts caused by artificial structures, such as the major four-lane highway—U.S. Route 13. This highway cuts through the northwestern part of Fisherman Island, causing noise, habitat fragmentation, and visually impacting the entire island. The highway travels along the surface of the island for about 1.6 miles and is raised on bridge abutments above the island for another 0.2 mile. A small unimproved road also exists on the island, allowing access by refuge staff and researchers. We did not complete our review and concluded that a more in-depth study is needed. Therefore, we will complete a wilderness review for Eastern Shore of Virginia, including Skidmore Island, and Fisherman Island within three years of approval of this CCP.



We will also evaluate Fisherman Island and Skidmore Island for their Research Natural Area potential within three years of final CCP approval.

### Refuge Revenue Sharing Payments

Annual Refuge Revenue Sharing payments to Northampton County, Virginia will continue. Future increases in payments will be commensurate with increases in the appraised fair market value of refuge lands, new acquisitions of land, and new Congressional appropriations.

### Volunteer and Internship Opportunities

The refuge will continue to offer the Workamper and Internship programs. These programs provide education to participants as well as much-needed administrative, public use, maintenance and biological help to the refuge.

### Research

We will encourage and support research and management studies on refuge lands that will improve and strengthen natural resource management decisions. Specifically, we will encourage and seek research relative to approved refuge objectives that clearly improves land management and promotes adaptive management. Priority research addresses information that will help us to better manage the nation's biological resources, that addresses important management issues, or that demonstrates techniques for management of species and habitats to: agencies of the Department of Interior, the U.S. Fish and Wildlife Service, the National Wildlife Refuge System, and State Fish and Game agencies.

We will also consider research for other purposes that may not be directly related to refuge-specific objectives, but contributes to the broader enhancement, protection, use, preservation, and management of native populations of fish, wildlife, and plants, and their natural diversity within the region or flyway. These proposals must pass the Service's compatibility policy.

We will maintain a list of research needs that will be provided to prospective researchers or organizations upon request. Refuge support of research directly related to refuge objectives may take the form of funding, in-kind services such as housing or use of other facilities, direct staff assistance with the project in the form of data collection, provision of historical records, use of management treatments, or other assistance as appropriate.

All researchers will be required to submit a detailed research proposal following Service Policy (FWS Refuge Manual Chapter 4 Section 6). In general, the refuge must be given at least 45 days to review most proposals before initiation of research and 60 days to



**Interns banding a tern.**

*USFWS photo*

enjoyment of refuge values. The erratic changes in engine pitch, the pulsation of sound produced by jumping wakes, and frequent changes in speed, in addition to the volume of sound, create a noise that is perceived as both an irritation and an intrusion on the refuge experience.

### Monitoring, Evaluation, and Adaptive Management

The Final CCP will cover a 15-year period. Periodic review of the CCP will be required to ensure that established goals and objectives are being met and that the plan is being implemented as scheduled. In many cases, monitoring is built into the strategies of the CCP.

We will monitor public use programs by continuing to collect and compile visitation figures and activity levels. In addition, we will establish research and monitoring programs to assess the impacts of public use activities on wildlife and wildlife habitat and to identify compatible levels of public use activities. We will reduce these activities if we determine that incompatible levels of public use are occurring.

Records of wildlife species using the refuges, their habitat requirements, and their seasonal use patterns will be updated regularly through collection of baseline data on all wildlife populations and habitats. The baseline inventories called for in General Refuge Management will annually survey breeding birds, grassland birds, marsh birds, frogs and toads, as well as collect data on vascular plants, vertebrates, invertebrates, threatened and endangered species, and trust resources on the Eastern Shore of Virginia and Fisherman Island Refuges.



**Southern leopard frog.**  
*USFWS photo*

In addition, the Species Inventory and Monitoring Plan, a step-down management plan to be initiated in 2006, will increase ability to monitor the refuges' biological resources by providing specific guidance for the systematic accounting of temporal and spatial trends in the abundance and diversity of species. Inventories will obtain, at a minimum, information on the abundance and distribution of vascular plants, vertebrates, and Federally endangered and threatened species. Monitoring efforts will target carefully chosen species in an effort to convey information about the status of the larger ecological system and the integrity of specific habitats or ecosystem processes. Rigorous and quantitative monitoring will be oriented toward management decisions to ensure scientifically-based management with proper feedback for adaptive management decisions.

Many of the strategies delineated in this chapter call for the monitoring and evaluation of the goal to which they refer. Extensive monitoring plans to measure understory response to thinning, the effects of deer on browse species and forage availability for neotropical migrants, prevalence of invasive species, changes in sand accretion and erosion, human and predator

disturbance, nesting site productivity, and presence of Federal listed species as well as a host of other biological resources are called for in the strategies of the plan. This extensive monitoring will enable us to evaluate refuge habitat management programs for positive and negative impacts on wildlife habitat and populations and to determine if these management activities are helping to meet refuge goals and objectives. Information obtained from monitoring will allow staff to set more specific and better management objectives, more rigorously evaluate management objectives, and, ultimately, make better management decisions.

## Chapter 3



**Royal tern colony.**  
*USFWS photo*

# Refuge and Resource Descriptions

- Refuge Administration
- Physical Environment
- Biological Resources
- Socio-economic Factors
- Public Use
- Cultural Resources

## Refuge Administration

### Staffing and Budget

Annual appropriations vary from year to year, depending on the Service's overall budget, and how the refuge's needs and requests rank regionally and nationally with other refuges. Table 3-1 summarizes budget and staffing levels from 1996–2003. Fluctuations reflect funding for special projects. For example, the maintenance budget for 1999 includes \$47,000 for Visitor Center repairs.

*Table 3-1. Refuge Complex staffing levels and budgets between 1996-2003.*

Fiscal Year	Operations	Maintenance	Full-time Staff	Part-time Staff
1996	347,200	77,800	6	0
1997	440,900	58,100	6	0
1998	416,600	25,100	7	0
1999	461,900	91,000	8	0
2000	522,200	75,600	9	0
2001	524,000	47,000	9	0
2002	599,500	54,800	9	0
2003	434,695	91,500	6	0

### Resource Protection and Visitor Safety

Law enforcement officers, with full authority to enforce federal regulations, are required to ensure resource protection and visitor safety. Presently, the Refuge Manager has dual function law enforcement responsibilities.

### Refuge Facilities and Maintenance

Existing facilities include the Visitor Center, refuge headquarters, an environmental education building, a conference building, four maintenance buildings, and seven refuge residences (including three houses for university and Non-Governmental Organization researchers and four houses for refuge staff and interns). The maintenance staff are responsible for repairs and upkeep of all these facilities, though some upkeep of the research housing is the responsibility of the respective organizations.

We also have a photo blind, kiosk, trails, three water control



structures, roads, gates, and signs such as boundary and informational signs. Maintenance staff are also responsible for the upkeep of these facilities. Responsibilities include periodically posting or replacing refuge boundary signs, mowing trails, grading and repairing the photo blind and kiosk.

There are several constructed ponds on the refuge. Freshwater is pumped into the Visitor Center pond to create wildlife observation opportunities showcasing migratory waterfowl, waterbirds, and shorebirds. Invasive species such as cattail are removed from that pond to enhance wildlife habitat and water levels are maintained seasonally. Storm water runoff provides freshwater to the northern pond. Four other refuge ponds are naturally fed by rain water.

Adjacent to the communications tower is a switching station that houses communications lines which cross the Chesapeake Bay Bridge-Tunnel and head north to Cape Charles. Although there is an above-ground building associated with the switching station, the lines run underground with several small pedestals. The switching station is owned and maintained by Verizon Virginia, Inc. and is under a lease agreement with the refuge.

The Refuge also owns and maintains 2.1 miles of paved roads on the Eastern Shore of Virginia Refuge. About 1.5 miles of those roads provide safe and easy public vehicular access to areas such as the refuge office, environmental education building, and conference center.

### Volunteer and Intern Programs

Northampton County, a rural community with a population of approximately 13,000, is one of the poorest counties in Virginia. Over a million people live in the Hampton Roads area which is only 25 miles south of the refuge but is separated from the refuge by the Chesapeake Bay. Consequently, the Chesapeake Bay Bridge-Tunnel connects these two land masses. Although the Hampton

Roads area is a prime place to recruit volunteers, most volunteers are unable or unwilling to pay the round-trip toll to cross the Bay Bridge-Tunnel.

As a result, over half the volunteer hours each year come from people participating in long-term volunteer programs, such as the Intern or Workamper programs. Advertisements for interns are placed on several websites and in local publications. These volunteers receive housing and a \$1,200 stipend for 12 weeks of volunteer service. Volunteers perform numerous tasks important to the Refuge including, but not limited to, staffing the



**Workamper sites.**  
*USFWS photo*

Visitor Center, conducting environmental education programs, building bluebird houses, conducting bird surveys, and banding and marking wildlife.

The refuge advertises for the Workamper Program in “Workamper Magazine,” a magazine that caters to the interests of volunteers who travel in motor homes. In 1997, the refuge installed three RV hookups with water, electricity and sewage disposal. Workampers agree to provide at least 20 hours of service weekly and stay at the refuge for at least a month. They perform many of the same duties assigned to interns, as well as numerous maintenance projects.

During an average year, seven people participate in the Intern Program and four to six in the Workamper Program. In all, volunteers contributed a total of 8,000 hours in 2000.

### Cooperating Association/Friends Group

The Chincoteague Natural History Association (CNHA), a Cooperating Association, was established in 1987. Its bylaws were amended in 1992 to include Eastern Shore of Virginia Refuge. The primary purpose of CNHA is to promote a better understanding and appreciation of the natural history and natural environment of Virginia’s eastern shore and Assateague Island, particularly the Chincoteague and Eastern Shore of Virginia Refuges.

CNHA has a sales outlet at the refuge’s Visitor Center that is primarily managed by refuge staff. Twenty-five percent of gross sales are returned to the refuge annually. Gross sales for 2000 were approximately \$32,000. The refuge submits a wish list of funding needs each year, and CNHA chooses which items to fund. In 2001, CHNA provided funds for environmental education, the volunteer program, special events, and stipends for interns.

### Special Use Permits

Special Use Permits (SUPs) are issued to individuals, organizations, and agencies requesting the use of refuge facilities or resources beyond what is available to the general public. SUPs are issued with special conditions and restrictions to minimize or eliminate disturbance to wildlife. They are also issued for variable time periods ranging from one day to one year depending on the request. The largest groups of permit holders are researchers and commercial watermen. An average of 16 research projects per year (based on a three-year period) have received SUPs for studies on northern saw-whet owls, royal terns, monarch butterflies, diurnal avian spring migrants, birds of prey, and rare plants on Fisherman Island Refuge. During 2002, 21 commercial watermen and about 50 recreational anglers purchased an annual SUP to access the boat ramp on the former Wise Point property.



**Tagged monarch butterfly.**  
*Charles Philip*

Other Special Use Permits issued include use of refuge facilities for law enforcement training and access to leased facilities such as the communications tower and U.S. Customs transceiver. We issue an average of eight of these permits per year.

## Research



**Banding a raptor.**  
*Charles Philip*

Research has greatly increased our understanding of the critical role that the Eastern Shore of Virginia and Fisherman Island Refuges play in avian migration. The refuge facilitates biological research by providing funding and housing for groups such as the Center for Conservation Biology at the College of William and Mary, the Coastal Virginia Wildlife Observatory, and Hampton University. Currently, at least seven on-going research projects are being conducted on the Eastern Shore of Virginia and Fisherman Island Refuges. Most research projects focus on migrant stop-over ecology, habitat requirements, and predator impacts on nesting colonies. The knowledge gained has led to many recommendations included in this plan. Much research remains to be done to adequately understand the resource requirements necessary to benefit avian species of concern.

Refuge managerial responsibility also lies with trust resources beyond migratory birds, such as with the Federal-listed Northeastern beach tiger beetle. In addition, refuge staff collect data from sea turtle strandings to contribute to the Virginia Institute of Marine Sciences' state sea turtle stranding database. Staff also collect marine mammal stranding data which contributes to the Virginia Marine Science Museum's State marine mammal stranding database.

## Physical Environment

### Land Use

#### *Land use history on the Eastern Shore of Virginia*

The Eastern Shore of Virginia lies on the southern tip of the Delmarva Peninsula. The peninsula is bordered on the east by the Atlantic Ocean and on the west by the Chesapeake Bay. This area has long been a rural agricultural area. Prior to colonization, however, the eastern shore was almost entirely forested with deciduous mixed hardwood (Wesler et al. 1981). According to Wesler, anthropologists believe that the indigenous people of the area were hunters and gatherers who lived in transient hunting camps in the upland and perhaps base camps on the river terraces, correlated with a generalized foraging economy. This type of land use changed with the arrival of Europeans.

During the exploration and early settlement period of the 17th and 18th centuries, forests were cleared to make way for land that could be farmed. Colonists on the lower Delmarva Peninsula cultivated grain, raised livestock, and, to a lesser extent, grew tobacco on relatively small farms. Records indicate that the land upon which the Eastern Shore of Virginia Refuge currently sits was purchased by the Simpkin family in 1766, then sold to the Custis family, another farming family, in 1803. The Custis family sold the land to the Hallett family in 1807. The land changed hands several times beginning in 1895, but by 1940 it was back under the ownership of the Halletts.

Soon after the Halletts reclaimed ownership, the majority of the farmland became Fort John Custis Army Base, later becoming the Cape Charles Air Force Base. Some land remained in agricultural use through 1990. Aerial photographs show that land on the western portion of the base was farmed from the 1960's to 1990 (Mata L. 1997). Crops farmed prior to the establishment of the refuge in 1984 were mainly grains such as wheat, barley, and soy beans. The refuge administered a cooperative farming program on approximately 75 acres from 1984 to 1990. Grains such as sorghum, millet, milo, and sunflower were planted and rotated with legumes (i.e., red clover) for wildlife consumption (Spady, 2000). Farming was discontinued on the refuge in 1990 and the fields were left fallow.

When the Eastern Shore of Virginia Refuge was established in 1984, removal of structures on the refuge was initiated to create habitat supportive of migrating birds and other wildlife. Residences, towers, a non-commissioned officer's club, tennis court, swimming pool, bowling alley, and over one 100 excess military structures were removed or demolished. Most of the once-developed land has revegetated via natural succession, thus increasing the acreage of seedling loblolly pine and shrub habitat. Unfortunately, non-native



**Kudzu, an invasive plant.**  
*Charles Philip*

plant species such as Japanese honeysuckle, fescue grass, phragmites, and kudzu have established themselves throughout much of the disturbed acreage of the former base and farmland. Other invasive species include autumn olive, multiflora rose, mustard, fennel, and lespedeza.

The Eastern Shore of Virginia refuge also includes Skidmore Island, sometimes called, “Long Point Island”, located approximately 1,000 feet off the mainland. The Service purchased the 108.5 acre-island from The Nature Conservancy in 1987. Approximately 40.5 acres lies above the mean high water line of Magothy Bay and consists mainly of brush and wooded upland. There are two buildings found here that are in poor condition. The remaining 68 acres lies below the mean high water line of Magothy Bay, and consists of mud flats, beach, marsh, and is flooded by tides.

#### *Land use history on Fisherman Island*

The earliest documentation of Fisherman Island exists in navigational charts of the Chesapeake Bay in 1815. Local people claim that the island was originally named Linen Island after a ship carrying a load of linen went aground in the early 19<sup>th</sup> century.

In 1886, the federal government leased and subsequently purchased Fisherman Island from its owner William Parker for an immigrant quarantine station. The quarantine station consisted of barracks for up to a thousand people and included a kitchen, mess hall, artesian well, and keeper’s residence. Records indicate the station was only used once in the treatment of yellow fever victims from the ship *Despa* in 1893. At the advent of WWI in 1914, soldiers from the Fourth Company of the Virginia Coastal Artillery National Guard were stationed on the island to protect the entrance of the Chesapeake Bay.

In 1932, the National Audubon Society tried unsuccessfully to influence Congress to transfer Fisherman Island to the Department of Agriculture. However, a letter sent by the War Department and signed by the Secretary of War on September 2, 1933 granted a permit for the period of five years, “revocable at will by the Secretary of War, to use as a migratory bird refuge, Fisherman Island Military Reserve, Virginia.” The Navy used the island as a harbor defense unit and, with the U.S. entry into World War II, as a submarine detection base. In 1943, the permit to use the island as a refuge was terminated by the Navy. In that year, nearly 300 mines were controlled by cables from the island and four radar-controlled 90-millimeter guns were installed. The artillery station was deactivated in 1944 and the land was transferred from the Army to the Navy, who maintained a LORAN radar navigation station on the island until 1969. Fisherman Island Refuge was established in 1969 and transferred to the Department of the Interior in 1973.

The remainder of Fisherman Island (the Isaacs and Adams islands



which had merged, split, then merged again with Fisherman Island in the early 20th century) was purchased from private land owners by the Department of the Interior in 1998. The last 25 acres owned by the Department of Defense was transferred to the Department of the Interior in 2000, putting the entire island under Service ownership.

Today, this southernmost barrier island in Virginia is separated from the Eastern Shore of Virginia Refuge by Fisherman's Inlet, a half-mile-wide body of ocean water. Onshore sand bar movement (accretion) continues to expand the island's size, currently estimated at 1,850 acres.

The Virginia barrier island chain is classified as a "Wetland of International Importance" under the RAMSAR Convention, one of only 17 sites so designated in the United States.

#### *Current land use trends*

Residential construction on the Eastern Shore of Virginia is on the rise. Personal communication with land use planners has revealed a development trend in Northampton County emphasizing the construction of second homes for retirees (McGowan 2000), thus reflecting the demographic trend of an aging population. In the spring of 2000, construction of an "Adult Community" (Wilbur Smith Associates 1999, p. 2-6) was beginning on a 2,000-acre tract of land. The development, located south of Cape Charles on the Chesapeake Bay has a 15-year build-out plan for up to 3,000 residences, plus two golf courses and other amenities. Additionally, a 224 slip marina is being constructed as part of this same development. Second home and recreational developments such as these pose the greatest threat to loss of valuable shoreline habitat on the Chesapeake Bay.

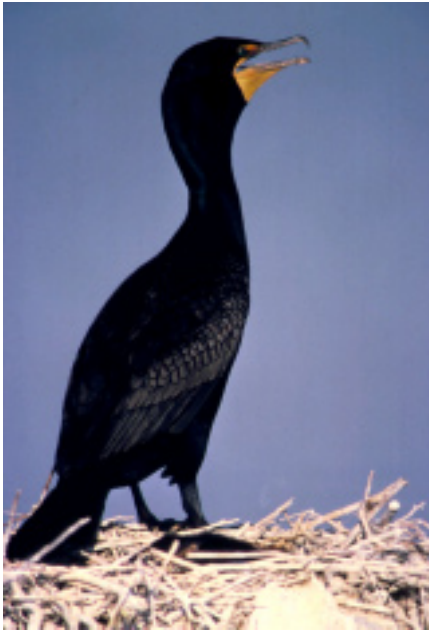
One possible reason for the recent development boom was speculation that the Chesapeake Bay Bridge-Tunnel (Bridge-Tunnel) toll would be reduced. On March 1, 2002 that speculation became reality. Now that the toll has been reduced, the eastern shore is likely to see more development and dramatic changes in its landscape.

However, Northampton County is in need of economic development. Cape Charles, with the largest population in Northampton County, has suffered from a shrinking population and a shrinking employment base for many years (Wilbur Smith Associates 1999). Between 1960 and 1990, the population of Cape Charles declined from about 2,040 to 1,400 residents, undergoing a 30 percent drop. The town's commercial district currently has a high number of vacancies. A tourism push could bring money, jobs, and people back to the area.

### *Roadways*

Future traffic growth is anticipated as land use development on the eastern shore intensifies. In July 1999, a consulting company working for the Accomack-Northampton Planning District Commission completed a “U.S. Route 13 Corridor Plan” (Wilbur Smith Associates 1999) for the Eastern Shore of Virginia. U.S. Route 13 is the principal north-south highway that traverses Virginia’s eastern shore. In addition to its role as the primary corridor for travel on the eastern shore, Route 13 also serves as an alternative route for through travel between the Carolinas, southeastern Virginia, and the Northeast. The study examined the 68-mile corridor of Route 13 that extends between the Maryland/Virginia state line south to the Bridge-Tunnel and includes both Accomack and Northampton counties.

The report found that since the completion of the Bridge-Tunnel in 1964, traffic on Route 13 has grown at an average annual rate of 2.7 percent. Traffic volumes vary within the corridor, with a low of about 8,000 vehicles per day at the corridor’s southern end (where the refuge is located) to about 20,000 vehicles per day at the corridor’s northern end. Truck traffic represents between 12 and 15 percent of total vehicular volume, a relatively high percentage for such a rural area (Wilbur Smith Associates p. ES-10 1999).



**Double-crested cormorant.**  
*USFWS photo*

### **Air Quality**

Virginia’s Eastern Shore currently has attainment status for air quality as required by the Federal Clean Air Act of 1970, which was amended in 1977 and again in 1990 (Wilbur Smith Associates 1999). Attainment status refers to whether a particular area meets or “attains” the National Ambient Air Quality Standards (NAAQS) as set by the Federal government in the Clean Air Act of 1970 (Gaba 1994). Those standards specify the concentrations of pollutants that may be present in the ambient air outside of buildings. As traffic volumes increase, air quality could decrease.

### **Climate**

The climate of the Eastern Shore of Virginia is mild and humid (USFWS 1984). The Atlantic Ocean and the Chesapeake Bay moderate temperatures, with a January average of 42 degrees and a July average of 77 degrees Fahrenheit. Precipitation averages 43 inches annually and is generally well distributed throughout the year with a slight increase during the summer months. Numerous rapidly moving polar fronts from the northwest dominate the weather pattern during the winter, while the summer pattern is characterized by little frontal activity and the domination of the “Bermuda High,” which brings moist air from the south.

The region is subject to two major storm types—northeasters and hurricanes—that bring high tides, strong winds, and heavy



**Red-spotted purple.**  
*Nancy Biegel*

precipitation (USFWS 1984). Northeasters generally occur during the fall, winter, and early spring and are characterized as slow moving low pressure systems that move up the Atlantic coast, generating strong northeast winds. Hurricanes can occur from June through November and may pass offshore in the Atlantic, directly along the coast, or inland. A hurricane's track will determine the extent of flooding and erosion. Although the region does not usually experience the extreme effects of hurricanes that occur further south, storm damage can be significant. The U.S. Army Corps of Engineers has reported that 11 major storms (four northeasters and seven hurricanes) have struck this area during the 20th century.

### Geology and Topography

#### *Eastern Shore of Virginia Refuge*

The Delmarva Peninsula lies in the Atlantic Coastal Plain, a seaward sloping province bounded on the west by a fall line and the Chesapeake Bay, and on the east by the Atlantic Ocean (USFWS 1984). The peninsula extends about 200 miles in a north-south direction and includes the State of Delaware and the eastern shores of Maryland and Virginia. The Virginia portion of the peninsula is approximately 70 miles in length and has an average width of six to eight miles. The peninsula was formed during the last glacial retreat when rising sea levels filled the large valley of the lower Susquehanna River, which became the Chesapeake Bay, thus isolating the area from the mainland. The extensive barrier island and marsh-lagoonal system along the eastern side of the Delmarva Peninsula was formed over several thousand years by broad sea level fluctuations, however, the exact method of island formation has not been determined.

The region experienced earthquakes in 1844, 1899, and 1918. There is also some evidence of recent uplifting of the Delmarva Peninsula, which is being offset by a rise in sea level. A study on elevation changes that have occurred during the past 30 years indicates that sea level is rising at an annual rate of 1.2 millimeters per year in the vicinity of the former Wise Point property (USFWS 1984).

Topographically, the region is nearly flat, indicating the past influence of the ocean and the more recent leveling effects of winds. Elevations of the lower Delmarva Peninsula are generally less than 20 feet, with the highest areas along the interior of the peninsula and bluffs along the Chesapeake Bay reaching elevations of 40 to 50 feet. Numerous tidal creeks extend inland and are fed by intermittent freshwater streams with bottomland forests. Many of the creeks have been dammed at their upper ends to create impoundments used for irrigation. Extensive salt marshes are found within the barrier island lagoonal system and fringing marshes occur along tidal creeks.

Within the refuge, the upland section is flat with elevations between 5 and 20 feet (USFWS 1984). Low bluffs and a narrow beach (20 to 50 feet wide) are present along the Chesapeake Bay shoreline. Low-lying woods, intertidal wetlands and numerous small tidal creeks and ponds are found along the eastern side of the peninsula.

The location of the refuge relative to the Chesapeake Bay and Atlantic Ocean exposes the area to the effects of winds, waves, and currents, causing erosion and accretion of the shoreline. The Chesapeake Bay shoreline experiences moderate erosion, which is slightly greater near the south end. The marsh-island complex of the refuge has exhibited little erosion since 1938.

### *Fisherman Island Refuge*

Fisherman Island has changed dramatically over the years due to geological processes. Dr. George Oertel (1999) of Old Dominion University writes:

“The onshore migration of offshore sand bars was the main process affecting the development of Fisherman Island. The bars appeared to come in from the southeast, and wrapped around to the north. The attachment of bars to the shoreline was spaced over relatively long time intervals. In the 89-year interval between 1863 and 1952 only three major bars welded to the island, an average of only one major event every 30 years. During the 45 subsequent years between 1952 and 1997, five additional major “bar-attachment” events took place. The interval between major events was more frequent at about one major event per 10 years. After each attachment event, a portion of the sand in the bar migrated laterally along the shoreline. However, sand was often transported in opposite directions due to wave refraction at the ends of the bar. The bimodal transport of sand effected the development of the eastern and western ends of Fisherman Island in distinctly different ways. The sand distribution to the west side of the island produced closely spaced beach-dune ridges that developed into sets of secondary dune ridges. The sand distributed to the east side of the island produced hammocks that were separated by wide reaches of marsh” (pp. 10–11).



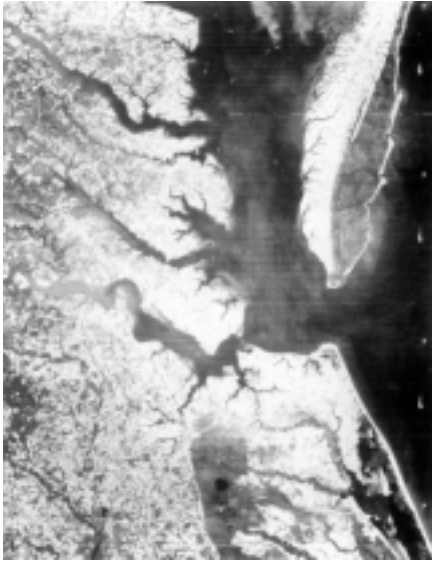
**Fisherman Island NWR.**

*USFWS photo*

### **Soils**

The soils of the Delmarva Peninsula are predominantly sand, silt, and shell fragments, and comprise six major soil associations, including Bojac, Munden, Nimmo, Newhan, Beaches, and Sulfaquent (USFWS 1984). The upland areas at the north end of the refuge are predominantly Mundane sandy loam and Bojac sandy loam, which have a 0–2 percent slope and are moderately well drained. Both of these soil types are classified by the Soil Conservation Service as prime farmland. The southern end of the

mainland consists primarily of Fisherman and Carteret fine sands. Tidal marshes are of the Sulfaquent and Natraqualf associations and include Chincoteague silty loam in the low marshes and Magotha fine sandy loam in the high marshes. Beaches with fine to medium sands are found along the exposed shorelines of the western and southern ends of the mainland and the barrier islands.



**Satellite image of the lower Delmarva Peninsula.**

*USFWS photo*

### Hydrology

Northampton County is somewhat unique with respect to hydrology because it has no major perennial free-flowing streams. The hydrology of the area can be discussed, therefore, in relation to the estuarine surface waters and groundwater.

### *Surface Water*

The Chesapeake Bay is the largest estuary in North America, encompassing about 2,500 square miles (U.S. Department of Transportation 1994). From its 11-mile wide mouth between Cape Henry and Cape Charles, it extends north about 195 miles almost to the Pennsylvania border. Along with the Delaware Bay estuary to the east, the Chesapeake Bay defines the Delmarva Peninsula. A characteristic of the Chesapeake Bay, and all estuaries, are its daily tides and salinity regime.

Biologically, the Chesapeake Bay is among the most productive bays in the world. Historically, its harvests of shell and finfish have been the highest of any North American estuary. This productivity is rooted in the large number of freshwater tributaries (150) that provide a regular influx of freshwater containing detritus and minerals to facilitate circulation of oxygen and nutrients, and gently sloping borders that allow productive marshlands an opportunity to grow (U.S. Department of Transportation 1994).

Numerous small tidal streams with freshwater headwaters are found on both the Chesapeake Bay and ocean sides of the peninsula. Rainwater percolates into the soil or runs off into natural or constructed drainage swales and ditches with flow into the tidal creeks and their headwaters. Surface drainage is generally east and west. The bayside of the peninsula drains to numerous creeks and ultimately into the Chesapeake Bay. The seaside of the peninsula drains to tidal creeks, backwater bays, and estuaries behind the coastal barrier islands, and ultimately into the Atlantic Ocean (Wilbur Smith Associates 1999). There are brackish ponds within the marshes adjacent to the mainland.



### *Groundwater*

The geology of Virginia's eastern shore (Accomack and Northampton Counties) has led to a complete reliance on groundwater resources for agricultural and residential use (Wilbur Smith Associates 1999). The communities on the eastern shore draw water from four aquifers. The upper aquifer (Columbia aquifer) is used primarily by the agricultural community, which draws 800,000 gallons per day (GPD) from this source. In addition, up to 4.4 million GPD are drawn from farm ponds, which often mix with underlying aquifer waters. Both the Columbia aquifer and individual farm ponds have been identified as having elevated levels of nitrogen. This is a common occurrence in agricultural areas. The remaining three aquifers (upper, middle, lower Yorktown aquifers) are used as a water source for residential and industrial consumption. Water withdrawals by both public supply systems and private wells account for approximately 3.5 million GPD, with about two-thirds of the total consisting of withdrawal from private wells. Private industrial withdrawals account for an additional 3.3 million GPD, primarily in association with poultry and shellfish processing.

In recent years, increasing concerns have been expressed regarding the impact of current and future activities on potable groundwater. As part of the U.S. Route 13 corridor study, a non-point source pollution assessment study was conducted for the Eastern Shore of Virginia (Wilbur Smith Associates 1999). Non-point sources of pollution generally come from roadway run-off and agricultural activity in a predominantly undeveloped environment. The three primary non-point source pollutants within Accomack and Northampton counties are nutrients, such as decomposing organic materials and airborne fertilizer particles; silt/sediment, such as dirt and soil washed off from fields or roads by storm water; and toxins, such as antifreeze, oil, and other materials dumped, dripped, or spilled from vehicles and equipment. If found in high enough concentrations, these pollutants could prove detrimental to wildlife and people.

Specific threats include the aquaculture industry, which has experienced recent growth on the eastern shore (Wilbur Smith Associates 1999). The concerns regarding this type of industry are untreated run-off and toxic spills. Recent studies of shellfish hatcheries, which draw water directly from the creeks both on the seaside and bayside, have found greater evidence of waterborne pollutants. Die-offs of larvae and elevated levels of pollutants following heavy rain have increased concern over the need to reduce non-point sources of pollution.

### *Flood Plain*

The mean tidal range in the area is four feet and the tidal waters are well mixed. Much of the area is subject to tidal flooding (U.S. Department of Transportation 1994). The Federal Emergency Management Agency (FEMA) defines the 100-year flood plain as



**Raccoon Creek, Eastern Shore of Virginia NWR.**

*USFWS photo*

any area that has a one percent chance of being flooded in any given year, or as any area where the land is less than nine feet above sea level on the seaside or eight feet above sea level on the bayside. In 1982, the 100-year flood plain was revised to include the effects of wave action. The maximum 100-year wave crest elevation has been reestablished to an elevation range of 11–13 feet above mean sea level.

Northampton County, which is estimated to contain about 22,500 acres of land in the flood plain (Wilbur Smith Associates 1999), participates in the National Flood Insurance Program. This program, administered by FEMA, requires habitable structures to be constructed with a first floor elevation above the 100-year flood plain and places limitations on other construction and alterations within the flood plain.

The area is also subject to minor rain-induced flooding in low lying areas with poorly drained soils, primarily at the southern end of the peninsula.

#### *Wetlands*

The eastern shore has a wealth of wetlands. Most of these are tidal wetlands comprised of salt marshes and tidal flats on the seaside and salt marshes on the bayside (Wilbur Smith Associates 1999). Freshwater wetlands occur at higher elevations than the tidal wetlands and, on the peninsula, are associated primarily with streams and creeks. The most comprehensive mapping of wetlands in Accomack and Northampton counties comes from the Service's National Wetlands Inventory maps. The evaluation of wetlands within the study area shows the relative abundance of tidal (estuarine) wetlands, such as deep water tidal habitats and adjacent tidal wetlands, tidal creeks, salt/brackish marshes, and mud flats on the edges of the peninsula. Fingers of estuarine wetlands reach inland into the peninsula along the stream channels to the limit of salt/brackish water intrusion.

The next most abundant wetland type on the mainland portions of the Eastern Shore is the inland freshwater wetland (palustrine). Freshwater wetlands include marshes, fens, swamps, bogs, wet meadows, as well as small shallow ponds or lakes. Many of the freshwater wetlands are adjacent to streams and creeks.

A relatively small amount of Lacustrine wetlands occurs within the study area, indicating permanently flooded lakes and reservoirs. The least common wetland type in the study area is the Riverine type, found along freshwater streams and creeks.

*Table 3-2. Wetland Types within Accomack & Northampton counties.*

Type	Subcategory	Total Acreage
Tidal (Estuarine)		145,000
Freshwater	Palustrine	62,250
	Lacustrine	250
	Riverine	49

### Contaminants

#### *Eastern Shore of Virginia Refuge*

Many of the contaminants issues on the eastern shore are related to past activities. Eastern Shore of Virginia Refuge was owned by the Department of Defense in the 1930's and operated as Fort John Custis until the 1950's. Thereafter, the facility was operated as Cape Charles Air Force Station until it was transferred to the U.S. Fish and Wildlife Service in 1984.

In 1999 the Service completed a Contaminant Assessment Process (CAP) for the Eastern Shore of Virginia Refuge (USFWS 2001a). The CAP is a standardized approach for documenting and assessing threats posed by environmental contaminants to lands and biota managed by the Department of the Interior. The completed CAP involved a thorough analysis of information on the ecological and physical characteristics of the refuge and surrounding area relative to possible contaminants issues. Also, it may provide recommendations for additional work to better assess ecological risk. The information summarized through the CAP can also provide the basis by which land managers select options to reduce contaminant impacts on species and their habitats.

According to the CAP for Eastern Shore of Virginia Refuge, the primary contaminant issues are:

- Identifying baseline sampling locations in the event of oil spills. Spills may occur along U.S. Highway 13/Bridge-Tunnel transportation route or from vessels in the Chesapeake Bay and the Atlantic Ocean. Spilled materials may affect the surface waters, marshes, coastline, and the species that use these habitats.
- Addressing remaining ecological risk issues due to former military disposal practices.

- Characterizing and controlling the contaminants related to the active firearms range in-holding which is owned by Northampton County and managed by the Service.

**Baseline Sampling Locations.**—The primary recommended baseline sampling area identified is Raccoon Creek. Due to the considerable shoreline habitat owned by the refuge a minimum of eight baseline sampling locations are recommended. Raccoon Creek consists of tidal creek and marsh habitats that would be sheltered from immediate effects of a spill to the Chesapeake Bay, Atlantic Ocean, or along U.S. Route 13 (including the Bridge-Tunnel). Raccoon Creek is accessible by water from the Wise Point boat ramp. Raccoon Creek provides habitat for a bay crab nursery and supports numerous small mammals and aquatic species including catadromous and anadromous fish. Productive wetlands serve as foraging, loafing, and nesting habitat for migratory birds, waterfowl, and shorebirds. Piscivorous birds also forage and nest on and near the refuge.



**Green tree frog.**  
*USFWS photo*

**Ecological Risk.**—The U.S. Environmental Protection Agency (EPA) prepared a Modified Site Investigation Narrative Report in 1998 to document levels of contaminants in groundwaters, surface waters, soils, and sediments. The EPA report sets forth the agency's preliminary evaluation of the associated human health risks.

The EPA discovered levels of arsenic measuring 8.3 parts per million in the soils around the occupied refuge residences. This level exceeds three times the background arsenic level and the EPA Region III human health risk-based screening levels. The EPA report recommended a site-specific health risk assessment for the residential area. In September 2000, the Service requested that the EPA evaluate the human health risk, as recommended in the report. In a letter to the Service dated November 27, 2000, EPA Region III stated that it "does not recommend a site-specific health risk assessment be conducted on the soils around the residences" based on the fact that the EPA normally recommends a clean-up goal for arsenic of 17 to 20 parts per million for protection of human health.

The EPA also found that sediment samples from the perennial wetland channel receiving discharges from the former on-site landfill and on-site lagoon contained levels of the organo-chlorine pesticide, DDE. The EPA concluded that DDE was impacting these wetlands.

Although the EPA report was limited in design, results indicate that at several locations within the refuge, organo-chlorine contamination may be impacting ecological receptors such as plants and wildlife. The extent of the contamination throughout the habitat is not adequately described by the sampling that was conducted and the results are not adequate to evaluate the ecological receptor risk. The Service's Virginia Field Office is currently working with the

U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and Virginia Department of Environmental Quality to procure funding to conduct sampling that will provide data to thoroughly evaluate ecological risk to wildlife from past military activities. This activity will include identification, characterization, and location of remaining sources of contamination.

**Firearms Range.**—The firearms range, located as an in-holding to the Eastern Shore of Virginia Refuge, is owned by Northampton County but managed and maintained by the refuge. Our Refuge staff schedule use of the range, mow the grass to maintain the firing lines, and maintain the general appearance of the range. Staff also collect and recycle spent brass casings.

Users of the firearms range include the U.S. Coast Guard, Northampton County Sheriff's Department, Bridge-Tunnel Police, U.S. Navy, Federal Bureau of Investigation, Virginia Marine Patrol, Virginia Department of State Police, and the U.S. Fish and Wildlife Service (see Table 3-3).

*Table 3-3. Firearms Range Users from January-December 1999*

User	Number of Days
U.S. Coast Guard	17
Northampton County Sheriff's Dept.	11
Chesapeake Bay Bridge-Tunnel	14
U.S. Navy	6
Federal Bureau of Investigation	4
Virginia Marine Patrol (VMRC)	3
VA Department of State Police	2
U.S. Fish and Wildlife Service	1

The small firearms range berm contains elevated levels of lead and several other metals. EPA sampling also revealed that sediment in the swale which drains the firearms range contained the organochlorine DDT, its breakdown product, DDE, and alpha-chlordane. Although the levels documented did not exceed human health risk-based concentrations, the EPA concluded these organochlorines were "impacting the wetlands on and around the site." However, levels did exceed ecological risk screening values. In August 2002, the Service conducted sampling on the marsh located directly behind the firearms range and on the Virginia Inside Passage. Lead was not detected in any of the samples (n=12), therefore the risk to ecological receptors due to lead outside of the range property is presumed to be insignificant. The results of the metals and organics analyses for these 12 samples are under review.



*Fisherman Island Refuge*

In 2000 the Service also conducted a CAP for Fisherman Island Refuge (USFWS 2001b). Similar to the Eastern Shore of Virginia Refuge, the CAP states that most of the contaminants issues on Fisherman Island Refuge fall into two major categories: 1) past military-related contaminant issues, and 2) potential impacts from spills.

**Contaminants Issues Related to Military Use.**—Contaminant issues on Fisherman Island Refuge related to military use were

resolved in 1996 when cleanup activities at Fisherman Island Refuge were concluded.

Completion of those cleanup activities followed recommendations in the Final Corrective Action Plan (USFWS 1994b) for the refuge. Cleanup activities included the removal of fuel tanks, tank vaults (emptied and decontaminated), pipelines, and contaminated soils. In 1995, a hot spot site (less than one-quarter-acre in size and limited to the top few inches of soil) of organochlorine pesticide (DDT) contamination referenced in the Final Corrective Action Plan was remediated.



**Former Military Compound on Fisherman Island NWR.**

*USFWS photo*

**Threats and Potential Impacts from Spills.**—Similar to Eastern Shore of Virginia Refuge, spills on Fisherman Island Refuge could result from vehicular accidents on U.S. Route 13. Although transportation of hazardous materials on the Chesapeake Bay Bridge-Tunnel is limited, small quantities of fuels, gases, and various combustibles and flammables can be transported. If a spill occurred in the vicinity of the refuge, or if a vehicular accident caused a fuel spill, the refuge habitat could be impacted. The impact of the spill would depend on the proximity of the spill to the refuge, the material spilled, the timeliness of spill response and control, and the volume of the material spilled. The Bridge-Tunnel Authority is trained in spill response management. Limited spill equipment is readily available at the Bridge-Tunnel District Offices.

Spills could also arise from vessel accidents in the Chesapeake Bay or Atlantic Ocean. Depending on where a spill might occur, hazardous materials could drift toward and impact the refuge. Spills could be devastating to both habitat and species (particularly nesting species) on the refuge or in the vicinity of the refuge. The CAP says vigilant attention to spill preparedness will be the first and most important line of defense to maintain and protect the refuge from a major catastrophic contaminant event. The extent of impact to the refuge would depend on the same factors listed above for a spill on U.S. Route 13, plus direction of flow and dilution.

**Other Contaminant Threats.**—The CAP also identifies other contaminant threats currently present on the Island. There is a threat of small sources of contamination from boaters arriving from smaller vessels. Most beaching vessels will be recreational boaters

and threat from contaminants is expected to be minimal and limited to small fuel spills, which would be a rare event. Also, it is possible that an aircraft could jettison material over the refuge. Such materials will likely be fuel or pesticides related to agricultural spraying activities.

**Baseline Sampling Locations.**—Fisherman Island Refuge is accessible from U.S. Route 13, which traverses it. In order to achieve a thorough baseline analysis of Fisherman Island, six sampling locations are recommended. Sampling can be conducted either from small boats coming ashore along the shoreline or by beach access using a fourwheel drive vehicle. We recommend analysis of organic and inorganic contaminants.

## Biological Resources

### Threatened and Endangered Species

#### *Northeastern Beach Tiger Beetle*



**Northeastern Beach Tiger Beetle.**

*USFWS photo*

The Northeastern beach tiger beetle is a Federal -listed species occurring on the Eastern Shore of Virginia Refuge. The beetle can be found on the southern tip beach, located on the Chesapeake Bay. A 1999 survey conducted by the Service (Knisley and Hill 1999) found 62 adult beetles on refuge property. Another 18 adults were found on the abutting property, which is owned by the Sunset Beach Resort.

Larger populations of this threatened subspecies occur along western facing beaches of Northampton County. According to the 1999 survey, Pickett's Harbor and Cape Charles beach (south), had population sizes of 2,412 and 512, respectively. Large populations occur all the way to Parker's Marsh in Accomack County.

#### *Piping Plover*

The Federal-listed piping plover has previously nested on Fisherman Island, although refuge records dating from 1975 show nesting to be sporadic at best with a maximum of five adults recorded in the breeding seasons of 1979, 1980 and 1983 during the annual colonial waterbird survey. State records indicate that one nesting pair occurred between 1991 and 1992. No breeding individuals have been observed on Fisherman Island since 1992. However, the piping plover is seen in small flocks during migration. In Virginia, piping plovers have historically nested on barrier beaches of Accomack and Northampton Counties from Assateague Island south to Fisherman Island, where they may sometimes compete for nesting habitat with Wilson's plover. Watts et al. (undated) found that piping plovers nesting on 13 barrier islands in Virginia from 1986 to 1988 were not evenly distributed along the islands. Beach segments used by plovers had wider and more heterogenous beaches, fewer stable dunes, greater open access to bayside foraging areas, and closer proximity to mudflats. They also note that the characteristics of beaches selected by plovers are maintained by storms. Needed improvements in breeding population numbers in Virginia have not been realized despite protective efforts, and volatility and uneven distribution have characterized recent plover numbers (Terwilliger and Cross, 1999). Census records from 1986–1999 indicate a declining trend in the breeding population from Parramore Island south to Fisherman Island. The 2001 Virginia piping plover census recorded only two breeding pairs on these southern islands, down from 30 pairs recorded in 1988. The combination of low recruitment in the southern Virginia barrier islands and limited availability of optimal nesting habitat may explain the absence of breeding birds (Terwillinger 2001).

The breeding history for the entire Southern Recovery Unit



**View from Bunker Overlook,  
Eastern Shore of Virginia NWR.**  
*Matthew Akel*

(Delaware, Maryland, Virginia, and North Carolina) also reflects fluctuating low numbers. A steep decrease in the North Carolina population (from 52 pairs in 1997 to 23 pairs in 2001) exacerbates concerns regarding the decline on the southern Virginia islands. The Piping Plover Recovery Team set a minimum target of 400 nesting pairs of piping plovers for the Southern Recovery Unit. However, 2001 census figures reported 208 nesting pairs, which is just 52 percent of the recovery goal (USFWS 2002). The Southern Recovery Unit average productivity in 2001 was 1.22 chicks per pair. This was substantially lower in 1997-99 than in 1993-96, and is still well below the 1.5 chicks/pair threshold that is needed to maintain a secure population. This decline is of particular concern given the small number of breeding pairs, and their distribution over a large geographic area. Thus, neither the population nor the productivity goal for the Southern Recovery Unit is being met, and the small piping plover population in these four states remains vulnerable to further declines.

We believe there is suitable breeding piping plover habitat on Fisherman Island, and dynamic coastal formation processes are likely to cause changes in the quantity and quality of breeding habitat over time. Even with suitable habitat, however, breeding activity will depend on availability of dispersing breeding birds. The presence of roosting herring and great black-backed gulls may also function as a deterrent. Since maximizing piping plover productivity and repairing gaps in their breeding range are critical to their recovery, our increased monitoring effort, which will allow us to detect presence of breeding pairs and implement prompt protection (particularly from predation) is of vital importance to the coastwide recovery program (Hecht 2001).

If breeding piping plovers occur on Fisherman Island in the future, our increased monitoring efforts will allow us to detect the presence of breeding pairs and protect them according to Recovery Plan guidelines.

#### *State-listed Species*

When State recovery plans for State-listed species become available, we will use them whenever practical to manage these species found on the refuges.

#### **Plant Communities**

The Delmarva Peninsula is part of the Mid-Atlantic Coastal Plain and is located along Virginia's southeast coast, an area characterized as an overlap between the northern and southern temperate zones where numerous northern plant species reach their southern limit and many southern species reach their northern limit. The Chesapeake Bay is a natural barrier to plant dispersal. Species more common further south in the Carolinas and southeastern Virginia are not found on the Delmarva Peninsula.

The Delmarva Peninsula is classified as the southeastern mixed forest province (Bailey 1995). The climax vegetation on the Delmarva Peninsula is dominated by loblolly pine and a variety of hardwoods including oaks, hickory, red maple, yellow poplar, sweet gum, and black gum. Clearing activities since European settlement in the 1600's have resulted in the creation of several successional habitat types including grasslands, shrubs, agricultural fields, and monotypic loblolly pine stands.

*Eastern Shore of Virginia National Wildlife Refuge*



**Grassland habitat.**  
*Charles Philip*

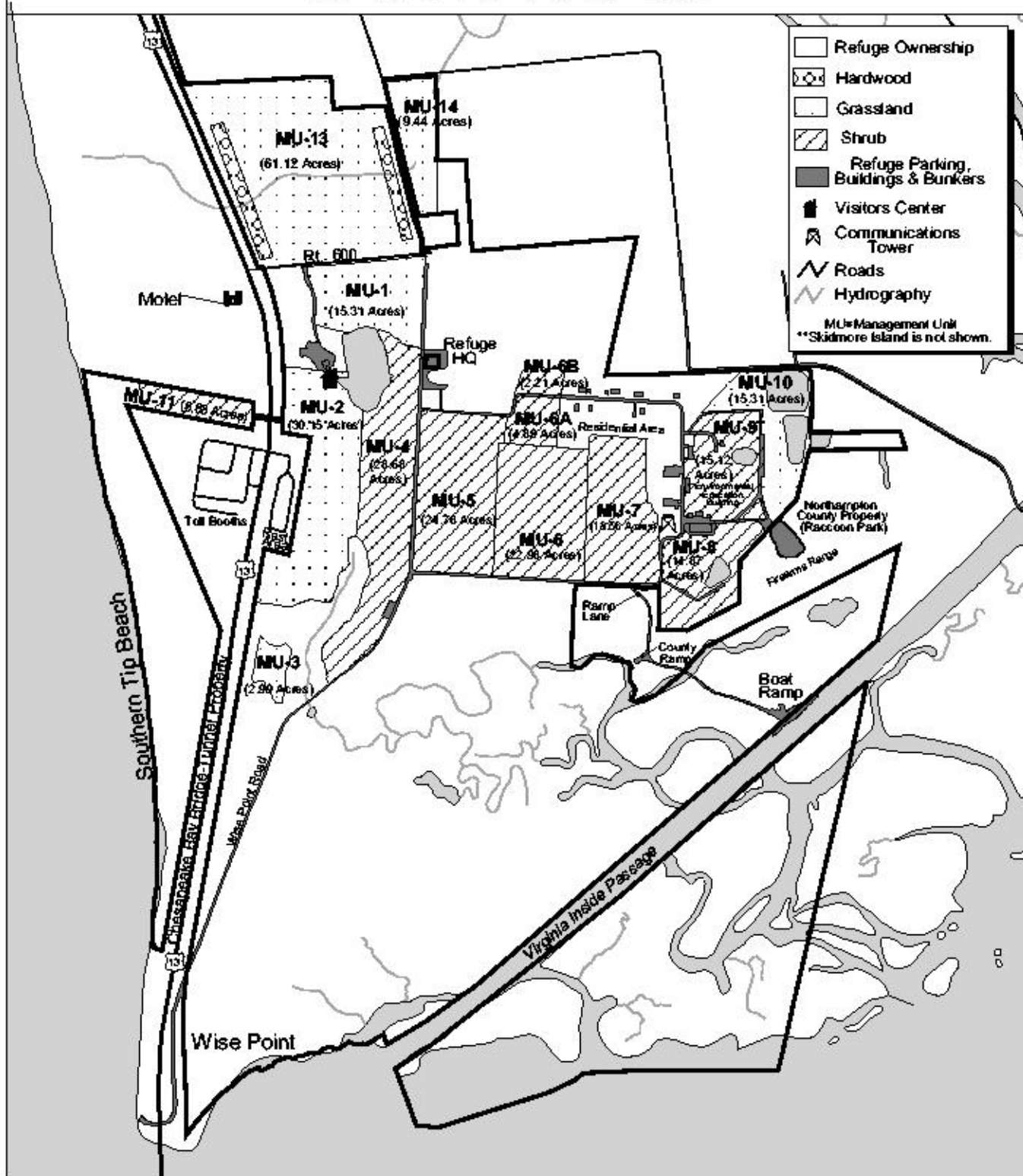
The refuge consists of approximately 185 acres of grassland and shrub/scrub habitat, most of which is concentrated to the south and southwest of refuge headquarters. For management purposes, we have divided this acreage into 14 Management Units (MU's) (see Map 3-1). Much of this land was either previously developed or farmed. The rest of the approximately 935 refuge acres is either forest, beach, marsh, or cleared land with buildings, described in more detail below. Appendix K contains a complete list of vegetative communities.

**Coniferous Forest.**—The two largest forested tracts on the refuge are dominated by loblolly pine. Approximately 118 acres of pine forest are located on Wise Point and 77 acres of pine forest are located along the Chesapeake Bay shoreline, on the refuge's western boundary. Both these forests are exposed to the harsh maritime influences of wind and salt spray; therefore, the vegetative community is unlike the climax vegetation found in more upland areas of the peninsula. The understory is dominated by Japanese honeysuckle, greenbrier, poison ivy, Muscadine grape, fox grape, Virginia creeper, trumpet creeper, and blackberry. A similar species composition can be found in the understory of all the forested acreage on the refuge.

**Mixed Coniferous/Hardwood Forest.**—The largest block of mixed coniferous/hardwood forest is located on the former Wise Point Corporation property. This approximately 53-acre block consists of forested "hammocks" dominated by loblolly pine mixed with oaks, black cherry, sassafras, wax myrtle, greenbrier, poison ivy, Virginia creeper, and some American holly. This forested area mainly occurs on old dredge spoil sites. This forest type consists of loblolly pine and Virginia pine and includes deciduous species such as white oak, southern red oak, black oak, willow oak, sweet gum, black gum, black cherry, red maple, flowering dogwood, yellow poplar, and hickories.

**Deciduous Forest.**—Deciduous forest covers about 60 acres north of the refuge headquarters. This habitat is oak dominant, consisting of white oak, southern red oak, black oak, and willow oak. An additional 40 acres adjacent to the Winslow Bunker are dominated by black cherry, black locust, sassafras, American holly, devil's walking stick, and yaupon holly.

# Habitat Management Eastern Shore of Virginia Refuge



**Data Sources:**  
1:24,000 Hydrography & 1:100,000 Road data provided by USGS with a source date of 1981 & 1985. All other data provided by USFWS. Projection/Date: UTM Zone 18, NAD 83, March 2000.

Map prepared for the Eastern Shore of Virginia MWR & Patuxent Island MWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section. March 2000.

This map is for planning purposes only.







**Wax Myrtle.**  
*USFWS photo*

**Shrub/Scrub.**—There are about 185 acres of shrub/scrub habitat on the Eastern Shore of Virginia Refuge. About 130 acres are located in the central and eastern portions of the refuge in Management Units 4–9. This habitat is expanding via natural succession into the grassland Management Units. Commonly found species include wax myrtle, black raspberry, blackberry, Eastern red cedar, Japanese honeysuckle, multiflora rose, autumn olive, willow, shining sumac, and common nightshade. Another 35 acres of shrub/scrub habitat exist on the former Wise Point Corporation land at the highest elevations of intertidal marsh, where the habitat transitions to upland forest. Vegetation is typically dominated by the salt-tolerant high-tide bush and groundsel bush, grading into wax myrtle and ultimately forest.

Shrub/scrub habitat can also be found on about 20 acres on the southern tip. The dominant species there are wax myrtle, bayberry, shining sumac, groundsel tree, and black needlerush. This habitat is slowly decreasing in acreage due to an adjacent stand of loblolly pine that is encroaching into this habitat area and blocking sunlight.

**Mixed Forb/Grassland.**—There are about 230 acres of mixed forb/grassland habitat, concentrated in Management Units 1, 2, 3, 10, 13, and 14. These grasslands consist of mixed forbs and grasses dominated by horseweed, ragweed, pigweed, goldenrod, common fennel, pokeweed, broomsedge, crab grass, goose grass, and patches of black raspberry and blackberry (Watts 2000). These fields are heavily impacted by non-native fescue grass. Eastern red cedar seedlings commonly sprout throughout these open-habitat areas.

MU 13 has a different composition of mixed forb/grassland. In the spring of 1999, the refuge planted warm season grasses in this management unit. Species planted included big bluestem, Indiangrass, switchgrass, eastern gammagrass, and coastal panicgrass. These drought-tolerant grasses are considered to be a good source of food and cover for both resident and migrating wildlife. During the first two growing seasons, these fields were inundated with weedy species dominated by mustard in the first season and horseweed in the second season.



**Switchgrass.**  
*USFWS photo*

**Salt Marsh.**—The former Wise Point Corporation tract includes about 290 acres of salt marsh along Raccoon Creek and the Virginia Inside Passage. The marsh is dominated by typical Atlantic coast marsh species such as salt marsh cordgrass, salt marsh hay, black needlerush, and scattered high-tide bush. Tidal creeks and mudflats occur throughout the tract and serve as feeding areas for waterfowl, wading birds, and shorebirds.

*Fisherman Island National Wildlife Refuge*

Succession has formed a mosaic of vegetative communities capable of withstanding the harsh environmental conditions present on Fisherman Island Refuge. The variety of habitats combined with the geographic location of the island, accessibility of food, protective shrub and thicket cover, and minimal human disturbance all make this island an important stopover location for migratory birds. Accretion has led to significant increases in beach and foredune habitat on the north/northeast and south/southeast portions of the island with similarly significant increases in salt marsh habitat in the northern section of the island.

**Beach/Foredune.**—This highly dynamic habitat occurs along the south and east perimeter of the island in a relatively narrow zone of 15–30 meters. It is composed of plants able to withstand dry sandy conditions, high amounts of salt spray, and low ground nutrient content (Oertel 1999). Vegetation is primarily composed of grasses such as salt meadow hay, running panic grass, American beach grass, and sand spur. Other plants include Russian thistle, seabeach orach, cocklebur, and searocket (Oertel 1999).

Seabeach knotweed, a globally rare plant, was discovered in August 2000. Forty plants were found on the southeastern end of the island, just east of the largest tidal pond. In addition, two populations of dune ground cherry were discovered, a plant rare to Virginia. Approximately a hundred plants were found on the northeast side of the island and a much larger population was found on the southwest side of the island.



**Beach and Dunes on Fisherman Island NWR.**

*USFWS photo*

**Primary Dune Ridge.**—The primary dune ridge lies landward of the beach/foredune zone along crests of low ridges. Vegetation is usually sparse or clumped and mainly colonized with grasses that have the ability to propagate via rhizomes and can withstand deep sand burial. The predominant species are American beach grass, running panic grass, salt meadow hay, and salt grass. These grasses extend into the primary swale where they tend to be more dense. The primary swales also have sparsely distributed shrubs, mainly wax myrtle and bayberry.

**Secondary Dune Ridge.**—The older secondary dune ridges are inland of the primary dune ridge and consist of a mosaic of species, including the grasses described above, with the addition of seaside goldenrod, switchgrass, prickly pear cactus, groundsel tree, and occasionally Atlantic white cedar. There are a few occurrences of spike grass.

The older secondary dune ridges have stands of woody vegetation such as myrtle, groundsel tree, black needlerush, eastern red cedar, and Atlantic white cedar. This zone also includes pioneers of sassafras, black cherry, willow, cottonwood, and tooth-ache tree. As this vegetation community stabilizes, natural succession leads to the growth of thickets and mature woods.

**Thicket.**—This habitat extends landward of the secondary dune ridges and consists of dense stands of primarily wax myrtle with scattered cherry, sassafras, tooth-ache and groundsel trees, and sumac. This community frequently includes several woody vines such as Virginia creeper, Japanese honeysuckle, and poison ivy. Thicket habitat is found on sites ranging from wet depressions to dry ridges. On wet sites, groundsel tree and marsh elder are significant components of this community.

**Deciduous Forest.**—Nearly all of the forested community is in a large contiguous area west of the Bridge-Tunnel. Cherry and sassafras dominate with scattered sumac, American holly, and tooth-ache tree along with many woody vines. Most of the forested habitat is characterized by a relatively open understory; however, shrubs (primarily myrtles) are gradually shaded out by canopy closure.

Southern beach spurge, a plant rare to Virginia, was discovered in August 2000, on the edge of the forest habitat in the northern interior of the island.

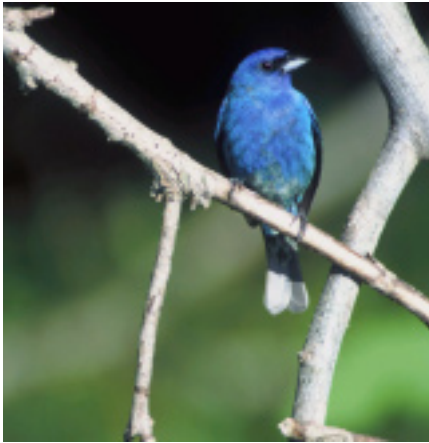
**Low Marsh.**—Frequently called tidal or salt marsh, these areas are subject to bimodal daily inundation. This habitat is characterized by a salt marsh cordgrass and saltwort in slightly higher elevations. There has been an increase in low marsh habitat on Fisherman Island Refuge due to accretion along the protected north and northeastern sides of the island.

**High Marsh/Transition.**—This habitat type encompasses the diverse areas between low marsh and various dune communities. This complex includes high marsh, marsh transition, salt panne, and the dune-marsh boundary. Component communities are sometimes very narrow (often only a few feet wide), discontinuous and ephemeral due to periodic overwash, wind, and natural plant succession. Common plants include salt marsh hay, saltwort, black needlerush, sea oxeye daisy, salt grass, groundsel tree, marsh elder, foxtail, seaside goldenrod, and phragmites. As with the low dune community, these are dynamic areas that are continuously changing.

**Freshwater Marsh.**—This habitat occurs in several small isolated depressions proximate to the Bridge-Tunnel. Species such as salt meadow hay, threesquare, beardgrass, smartweed, and phragmites are found in these areas. Encroachment by the thicket community and phragmites invasion continues to alter the character of this habitat.

## Wildlife Resources

### *Avifauna*



**Indigo bunting, a neotropical migratory bird.**

*USFWS photo*

The southern tip of the Delmarva Peninsula has been identified as an important migratory bird stopover location along the Atlantic coast (Mabey et al. 1993). In the mid-Atlantic region, migratory birds are influenced by three major water bodies—the Delaware Bay, the Chesapeake Bay, and the Atlantic Ocean. The narrow peninsulas created by these water bodies cause a funneling effect on the birds as they fly south. Once the birds reach the southern tip of the Delmarva Peninsula they are faced with crossing the Chesapeake Bay. The Eastern Shore of Virginia and Fisherman Island Refuges, fortuitously located at the southern tip, provide critical stop-over habitats where the birds can rest and feed before resuming their migration.

Birds that breed in northern parts of North America migrate south during the late summer through fall into Central and South America where food supplies are more abundant and weather conditions more favorable for survival. Migration of several hundred to thousands of miles are stressful and hazardous for these birds, forcing them to expend a considerable amount of energy. While migration routes of individual species sometimes vary, it is generally believed that most land birds and raptors have specific migration corridors which are defined by weather patterns and geographic influences. Prevailing winds from the west push birds southeastward as they migrate. Major geographical features such as mountain ranges and coastlines provide a combination of visual navigational references and favorable air currents.

The first southward migration for juvenile birds can be particularly stressful due to lack of previous navigational experience and because juveniles are not as strong as adult birds. For these reasons, juveniles are pushed further eastward during migration to the Atlantic coastline to a much greater extent than adult birds. Indeed, the majority of the birds passing through the lower Delmarva Peninsula during the fall migration are juveniles (Hodnett 1998).



**Little Blue heron.**

*USFWS photo*

In this section, avifauna are separated into five categories: colonial nesting waterbirds, shorebirds, waterfowl, raptors, and land birds. Each category will contain information about the location, habitats, and seasonalities of these species. As a general rule, colonial nesting waterbirds, shorebirds, and waterfowl are more likely to be found on Fisherman Island Refuge, while a large abundance of diverse land bird species are known to exist on Eastern Shore of Virginia Refuge. One notable exception is raptors.

**Colonial Nesting Waterbirds.**—Fisherman Island Refuge supports various colonial and beach nesting waterbirds such as herons, egrets, gulls, terns, ibis, and oystercatchers. Virginia's barrier islands have historically supported large numbers of colonial



nesting waterbirds. In recent years many of these colonies have suffered dramatic losses, from mammalian and avian predation.

The populations of colonial nesting birds on Fisherman Island Refuge, however, have not declined along with the populations on many of Virginia's other barrier islands. The refuge continues to support large royal tern and brown pelican nesting colonies with over 1,600 and 1,000 pairs respectively (2002). Forster's tern, common tern, and sandwich terns commonly nest on Fisherman Island in small numbers of less than 28 nesting pairs per species. Laughing, herring, and great black-backed gulls nest in close proximity to the tern and pelican colonies with over 2,200 pairs of gulls recorded in 2000.

Long-term research on the demographics and distribution of royal terns is currently in progress. Royal tern chicks have been banded at their natal site on Fisherman Island Refuge for 33 years with a total of 69,559 royal tern chicks banded between 1957 and 2000. Annual banding totals approximate chick production. Numbers have fluctuated between a low of 908 and a high of 4,628 between 1980 and 2000.

**Shorebirds.**—Large numbers of shorebirds migrate along the barrier island chain of the Delmarva Peninsula. These birds move northward to their breeding grounds from March through May and travel south to their wintering areas from July through October. Many of these shorebirds stop to rest and feed on Fisherman Island. Common species include black-bellied and semipalmated plover, greater and lesser yellowlegs, spotted sandpiper, whimbrel, ruddy turnstone, red knot, semipalmated, solitary and least sandpiper, dunlin, short-billed dowitcher, and common snipe.



**Greater yellowlegs.**

*USFWS photo*

Marbled godwit populations concentrate on the eastern shore along the mudflats just west of Smith Island. This bird is considered to be one of the less common of the migratory shorebird species. Other shorebird species found on Fisherman Island include the upland sandpiper, buff-breasted sandpiper, and golden plover.

Some of these migrating shorebirds also breed on Fisherman Island. Relatively small numbers of American oystercatcher nests have been found dispersed along the perimeter of the island. Twenty American oystercatcher nests were found in 2000 (Terwilliger 2000). Thirty-four pairs of American oystercatchers were found in 2001 and 2002. Historically, black skimmers nested on Fisherman Island in relatively large numbers throughout the 1970's, but have not been recorded since 1980. Wilson's plover and piping plovers have nested on the island in past years, but have not been recorded nesting since 1992.

Marsh birds such as the Virginia rail, clapper rail, and sora can be found breeding in the cordgrass dominated saltmarsh which comprises approximately 50 percent of Fisherman Island. The clapper rail is a

year-round resident, though some may be migratory.



**Black duck.**  
*USFWS photo*

**Waterfowl.**—The barrier island bays and wetlands of Virginia, such as the ones found on Fisherman Island, are important in the Atlantic Flyway because they provide feeding and resting habitat for waterfowl during the fall and spring migration. This habitat also serves as the wintering grounds for many species of waterfowl. Waterfowl that winter on Fisherman Island include snow goose, Canada goose, green-winged teal, and northern pintail. Tidal ponds are also attractive wintering habitat for red-throated and common loon, and the horned grebe. Black ducks and gadwalls use the marsh and brackish ponds on Fisherman Island Refuge for breeding.

**Raptors.**—Researchers and volunteers from the Center for Conservation Biology at the College of William and Mary and the non-profit Coastal Virginia Wildlife Observatory have conducted raptor banding on the refuges for many years. Sixteen species of raptors (see Appendix L) are annually caught and banded using mist nets and bow traps. Relatively large numbers of sharp-shinned hawks, Cooper's hawks, peregrine falcons, and red-tailed hawks are banded each year. Researchers and volunteers have banded record numbers of merlin on the lower eastern shore over the last few years. Approximately 95 percent of the 857 birds captured on the lower Delmarva Peninsula in 1999 were juvenile or hatch-year birds. This trend is consistent with previous years indicating a divergence in migration routes between adults and juveniles.



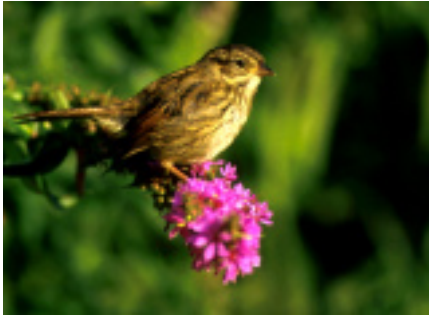
**Saw-whet owl.**  
*USFWS photo*

In 1994 the Center for Conservation Biology discovered a significant autumn migration of northern saw-whet owls moving down the lower Delmarva Peninsula. Although saw-whet owls are year-round residents throughout much of their breeding range, some populations migrate to wintering areas at lower latitudes (Weir et al. 1980). During the fall of 1999, a total of 700 saw-whet owls were captured from three sites located on the lower peninsula. Data indicates a bimodal migration pattern down the eastern shore with most hatch-year birds moving through the lower Delmarva in early- to mid-November and a greater proportion of after-hatch-year birds moving through in late November and early December (Paxton and Watts 2000). Two other wintering owl species

detected on Eastern Shore of Virginia Refuge are the short-eared and long-eared owls.

Ospreys nest on artificial nest platforms. A pair of peregrine falcons are resident to Fisherman Island Refuge and often nest on the island's hacking tower.



**Swamp sparrow.***USFWS photo*

**Migrant Land Birds.**—Many of the land birds found on Virginia’s eastern shore are migrants which pass through the refuge during either the spring or fall seasons. Researchers and others have observed that these land birds spend relatively short time periods (days or weeks) resting and feeding before continuing their journeys. There are two types of migratory birds that visit the refuges—temperate and neotropical. Temperate migrants leave their breeding grounds in the northern latitudes of North America in the fall to spend winters in the more mild mid-Atlantic and southern United States. Neotropical migrants also summer in the United States and Canada, but winter in Central and South America.

The warbler’s taxonomic family, Emberizidae, is the largest family of migrants to visit the lower eastern shore. Warblers use the forested stands and shrub thickets of the Eastern Shore of Virginia and Fisherman Island Refuges for food and cover. Their diet consists mainly of arthropods, fruit, and nectar; but they will also eat mollusks (small snails, slugs) and worms (Dunn and Garrett 1997). Fruit from the Eastern Shore of Virginia Refuge’s bayberry and wax myrtle thickets sustains many warblers during the fall migration, especially the abundant yellow-rumped warbler.

Temperate migrants tend to move through the area at later times than the neotropical migrants and in two general migration waves (Paxton and Watts 2000). Early temperate migrants are comprised of species such as the yellow-rumped warbler, common snipe, eastern meadowlark, and grasshopper sparrow. The later wave of temperate migrants consists primarily of American goldfinch, white-throated sparrow, white-crowned sparrow, chipping sparrow, and orange-crowned warbler. Other sparrow species (i.e., savanna, swamp, song and field) also occur throughout the migration season.

Thrushes observed migrating are the veery, gray-cheeked, Bicknell’s, hermit, wood, and Swainson’s thrush. Migrating swifts and swallows include the chimney swift, rough winged, bank, and cliff swallows. Flycatchers observed migrating through the Eastern Shore of Virginia Refuge are the acadian flycatcher, willow flycatcher, and eastern phoebe.

**Breeding Land Birds.**—A variety of land birds breed in the diverse forest, shrub, and grassland habitats of the Eastern Shore of Virginia Refuge. These breeding land birds include the northern bobwhite, field sparrow, song sparrow, and rufous-sided towhee.

Breeding warbler species include the pine and prairie warblers and the yellow-breasted chat. Other nesting species on the refuge include the indigo bunting, blue grosbeak, yellow-billed cuckoo, and ovenbird.

The swallows and thrushes that breed on the refuges are the purple martin, tree swallow, barn swallow, eastern bluebird and the wood thrush.



**Eastern bluebird.**  
*USFWS photo*

**Winter Resident Land Birds.**—These avian species are temperate migrants that spend part or all of the winter on the Eastern Shore of Virginia Refuge. One of the most studied of these species is the American woodcock. The woodcock is found in high numbers on the lower Delmarva Peninsula during fall migration. Woodcock follow a fall migration pattern in which they concentrate at Cape May, New Jersey, then move southward through the Northampton County area, then on to wintering areas in the coastal plain of the south Atlantic states. The peak woodcock migration on the Delmarva Peninsula lasts from late November to early January. The Eastern Shore of Virginia Refuge provides important woodcock habitat both during migration and for wintering, when woodcock stay during mild winters until they migrate to their breeding grounds in mid-February. Woodcock use low lying woods and shrub areas for food and cover during the day and utilize open grassland fields at night for feeding and roosting. Woodcock will also nest throughout the Delmarva Peninsula where suitable habitats exist. Sparrows and warblers also winter on the refuge.

**Year-Round Resident Land Birds.**—Year-round residents, as their name implies, spend their lives in one general area. Year-round residents on the Eastern Shore of Virginia Refuge include the Carolina wren, northern mockingbird, bald eagle, American kestrel, and killdeer. The wild turkey, which was reintroduced to the lower Delmarva Peninsula, also spends all year on the refuge. Year-round resident woodpeckers include the red-bellied, downy, hairy, and pileated woodpeckers and the Northern flicker.

### *Predators*

Predation, both mammalian and avian, threatens the colonial waterbird nesting colonies on Fisherman Island Refuge. Evidence of mammalian predation on Fisherman Island Refuge appears limited and significantly lower than other barrier islands in Virginia (Truitt 2000). Red fox is the greatest perceived mammalian threat to the Refuge's colonial seabird nesting colonies.



**Northern flicker**  
*USFWS photo*

Diurnal observations of predation on Fisherman Island Refuge identified no serious problems until the summer of 2003 when raccoons preyed on both the royal terns and brown pelicans. The potential threats from gulls, including predation, competition, and displacement, are our most imminent concerns. Researchers conducted weekly monitoring of bird colonies on the refuge in 2000 to determine the extent of predation and interspecific behavioral patterns between nesting terns and their perceived predators such as raccoon, fox, otters, and gulls. Researchers observed avian predation on tern chicks and eggs by herring and great black-backed gulls, but obtained no conclusive evidence. Adult tern mortality was documented early in the nesting season, but direct evidence of the cause was not determined.

The most serious predator problem on Eastern Shore of Virginia



**Flying squirrel.**  
*Nancy Biegel*

Refuge is feral cat predation on migratory birds and small mammals. Feral cat predation has been directly observed by refuge residents and researchers and is generally considered to have a significant impact on trust resources.

### *Mammals*

Thirty-four mammal species are recorded for the lower Delmarva Peninsula and are also likely to be found on the Eastern Shore of Virginia Refuge. Those mammals include the gray fox, red fox, raccoon, white-tail deer, river otter, American mink, muskrat, eastern cottontail, southern flying squirrel, and northern short-tailed shrew.

Nine species of bats are likely to be found on the Eastern Shore of Virginia Refuge, but additional research is needed to confirm their presence. Those bats species are the big brown bat, silver-haired bat, eastern red bat, hoary bat, yellow bat, little brown myotis, northern myotis, eastern pipistrella, and the evening bat.

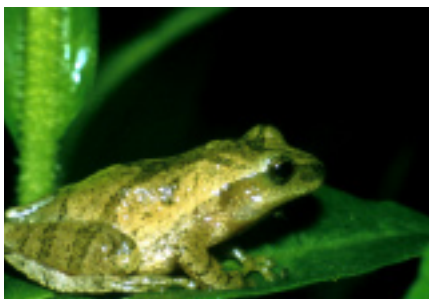
Comprehensive mammal surveys are not available for Fisherman Island Refuge.

### *Reptiles and Amphibians*

Modern herpetofauna on Virginia's eastern shore has been affected by the loss and alteration of natural habitat, such as the effect on freshwater wetlands caused by agricultural practices. Natural sources of surface freshwater in Northampton County are limited in part because of the historical loss of pocosin-like wetlands (Pettry et al. 1979).

Very few amphibians or reptiles have been studied in any depth on the eastern shore (e.g., Dunson 1986, Scott 1986, Hrantiz et al. 1993). None have been studied from the perspective of population size and dynamics, life history traits, or movement ecology.

According to the 2001 Region 5 anuran survey, the frogs and toads that can be found on the Eastern Shore of Virginia Refuge include the northern spring peeper, southern green frog, southern leopard frog, Fowler's toad, and eastern narrow-mouthed toad.



**Spring peeper.**  
*USFWS photo*

The freshwater and estuarine turtles which inhabit Eastern Shore of Virginia Refuge are the eastern painted turtle, spotted turtle, eastern mud turtle, northern red-bellied cooter, eastern box turtle, eastern snapping turtle, and the estuarine northern diamond-backed terrapin.

Four species of salamanders are likely to be found on the refuge, although more research is needed to confirm their presence. Only one species of salamander—the red-backed salamander—is commonly found. Other species include the spotted salamander, marbled salamander, and the red-spotted newt. The Eastern Shore

of Virginia Refuge supports four species of lizards and 11 species of snakes.

Insufficient records have been compiled to make a comprehensive reptile or amphibian species list for Fisherman Island Refuge. Baseline inventories and basic natural history information are needed for herpetofauna on both the Eastern Shore of Virginia and Fisherman Island Refuges.

### *Invertebrates*



**Buckeye.**  
*Dennys Ariola*

Researchers have conducted butterfly surveys in the area since 1997. Sixty-four species of butterflies and skippers have been confirmed on the Eastern Shore of Virginia Refuge (see Appendix A). In 1999, a researcher from the Coastal Virginia Wildlife Observatory tagged 955 monarch butterflies from both refuges and from nearby roosts in hopes of identifying and protecting the major roosting sites on the lower Delmarva Peninsula. It is estimated that during the height of the 1999 migration, 50,000 monarchs were seen roosting in one evening. The researcher also discovered roosting locations of migrating monarch butterflies on Fisherman Island. Roosts were found on the secondary dunes with estimates ranging from 10,000 to 50,000 individuals. During one evening in early October 1999, an estimated 100,000 individuals were

discovered on various trees on the southern portion of Fisherman's Island. The monarch butterfly research project continued in 2000, when 715 butterflies were tagged in the fall.

Baseline inventories for invertebrate species other than lepidopterans on the Eastern Shore of Virginia and Fisherman Island Refuges are not available.

### *Aquatic Resources*

The shallow estuarine waters surrounding Fisherman Island are highly productive. Algal phytoplankton and detritus produced by the extensive wetlands dominated by saltmarsh cordgrass make up the first order of the food chain. Intermediate levels of the aquatic food chain include a number of zooplankton species and benthic species dominated by annelid worms, mollusks, and crustaceans. Submerged aquatic vegetation around Fisherman Island is limited to a few small patches on the northern end.

Many of the aquatic shellfish resources in the area are used for commercial purposes. Hard clam beds have been planted by commercial aquaculturists throughout suitable habitat along the southern peninsula. Much of the area between Skidmore and Smith Islands is leased by watermen from the State of Virginia for clam beds. Many of the bayside creeks also have planted clam beds wherever the depth is appropriate. Blue crabs are commercially harvested offshore using crab traps. Many crab pots are





**A depiction of a spotted seatrout.**  
*USFWS photo*

concentrated on the north end of Fisherman Island. Oyster grounds are currently being restored by the Virginia Institute of Marine Science, just north of Fisherman Island Refuge.

Finfish of primary importance that use the surrounding waters for spawning, nursery, or feeding areas include black drum, red drum, bluefish, winter flounder, summer flounder, menhaden, spot, Atlantic croaker, grey trout, mullet, spotted seatrout, and striped bass. The species caught by recreational and commercial fisheries vary seasonally. Peak fishing periods are April through October, with a rockfish season in December.

## Socio-economic Factors

The Eastern Shore of Virginia lies on the southern tip of the Delmarva Peninsula and is made up of two counties—Accomack and Northampton. This section will mainly focus on Northampton County, since that is where the Eastern Shore of Virginia and Fisherman Island Refuges are located. However, information on Accomack County will be provided for the sake of comparison.

Northampton County is 35 miles long and includes about 230,000 acres. In general, the County is not a destination point for most travelers, but rather a stop along their route. This is largely because the Chesapeake Bay separates Northampton from the Hampton Roads area of Virginia, a major metropolitan area with over a million residents. Although the Chesapeake Bay Bridge-Tunnel (Bridge-Tunnel) connects Northampton County to mainland Virginia, the \$20 round trip toll to cross the Bridge-Tunnel has, in the past, prevented many people from visiting the eastern shore. The Bridge-Tunnel Authority, however, recently instituted a commuter toll of \$14 round trip in a 24-hour period for two axle vehicles. This reduction in toll price has had major impacts on the Eastern Shore of Virginia's growth. Many new housing developments have been built in recent years. New hotels, restaurants, and shopping areas are expected in the next few years. A developer is constructing an up-scale golf course community in Cape Charles, located about 10 miles north of the refuge. This community will include up to 3,000 homes and townhouses, a boat marina, hotel, and speciality shops. The first of two golf courses was completed in 2001.

### Population and Employment on the Eastern Shore of Virginia

According to the 2000 Census, the Commonwealth of Virginia's population was 7.1 million, reflecting more than a 14 percent increase over the last 10 years (U.S. Census Bureau 2000). Northampton County, in contrast, had only a 0.2 percent population increase over the last 10 years, bringing its 2000 population to 13,093. One report says Northampton County's population has suffered because agricultural practices have become less labor intensive and more mechanized (Wilbur Smith Associates 1999). Also, several major seafood processing facilities have closed or relocated outside Northampton County. Northampton County's primary industry is agriculture (Adams et al. 1999). Northampton and Accomack County together produce 70 to 75 percent of Virginia's vegetable crops.

While the Eastern Shore is one of the poorest areas in Virginia, its economy boasts a broad range of industries and retains competitive advantage in key traditional and emerging industries (The Louis Berger Group 2000). Few residents commute outside the region for employment. Unemployment is currently low, but given the mix of local industries, employment is highly seasonal and skewed toward



professionals with lower rates of pay.

The total number of full-time, part-time, and proprietorship employment positions grew slightly in both Accomack and Northampton counties from 1990 to 1998 (The Louis Berger Group 2000). Northampton County showed a 3.6 percent gain during that period while Accomack had an increase of less than 1 percent. Overall, the number of jobs on the eastern shore remained relatively steady throughout the last decade, with a slight increase in jobs over the last two years. In contrast, Virginia saw a 15 percent increase in jobs from 1990 to 2000.

Despite the steady number of jobs on the eastern shore over the last 10 years, the area has shown a steady decline in its labor force. Improved economic conditions towards the end of the last decade put the 2000 labor force at just below 1990 levels. A shrinking labor force is common to rural areas with fixed levels of employment opportunities and an outflow of working-age young people searching for a broader range of opportunities (The Louis Berger Group 2000). Furthermore, an influx of retirement-age people has kept the population fixed, but has not contributed to the labor pool. A decline in the labor force and a slight increase in the number of jobs has contributed to low unemployment rates.

The service and retail/wholesale businesses were the biggest employers in Northampton County throughout the 1990s. The government and agriculture sectors also added jobs during this period, offsetting a 50 percent decline in the County's manufacturing sector, which employed 400 people in 1998.

Weekly earnings on the eastern shore vary widely by profession and sector of the economy. The government sector posted the highest average weekly earnings at \$540 a week (The Louis Berger Group 2000).

In 1999, Northampton County had a per capita personal income (PCPI) of \$20,233 (Bureau of Economic Analysis 2000). PCPI is calculated as the total personal income of the residents of an area divided by the population of the area. This figure is often used as an indicator of the quality of consumer markets and of the economic well-being of the residents of an area. Northampton's PCPI ranked 72nd out of 105 counties and independent cities in Virginia. This ranking is 68 percent of the state PCPI average (\$29,794), and 71 percent of the national average (\$28,546). Northampton's 1999 PCPI reflected an increase of 3.5 percent from 1998. In contrast, the state average increased by 5.0 percent in 1999, and the national change increased by 4.5 percent (Bureau of Economic Analysis 2000).

### **Refuge Contributions to the Local Economy**

One way the refuge contributes to the economy of Northampton County is by protecting wildlife habitat, or "open space," in perpetuity. A "Cost of Community Services Study" (COCS) for

Northampton County, Virginia (Adams et al. 1999) documents the benefits of open space. COCS is a case study analysis of the net fiscal impacts of different land uses. It provides a snapshot in time of costs versus revenues based on current land use. These studies are based on real budgets for a specific community. The analysis shows which services private residents receive in return for the taxes they pay to their local community. These studies have shown that open space costs towns less than residential or commercial development. This is because residential and, to a lesser extent, commercial development require services costly to the town such as schools, utilities, and emergency services. Although residential and commercial development increase an area's tax base, expenses incurred by the area for increased services outweigh the taxes generated from residential and commercial uses.

The refuge directly contributes to the local economy through "Refuge Revenue Sharing" payments. The Federal government does not pay property tax on refuge lands, but instead makes annual payments to respective counties based on a maximum of 0.75 percent of the fair market value of refuge lands, as determined by an appraisal every five years. The actual amount distributed each year varies and is based on Congressional appropriations. The amount distributed also changes as new lands are acquired. Table 3-4 depicts the amounts contributed to Northampton County between 1995 and 2002.

**Table 3-4.** *Refuge Revenue Sharing payments from Eastern Shore of Virginia and Fisherman Island Refuges to Northampton County.*

	Number of Acres		Total Paid to Northampton County	
	Eastern Shore of Virginia Refuge	Fisherman Island Refuge	Eastern Shore of Virginia Refuge	Fisherman Island Refuge
<b>1995</b>	725	1,000	\$12,241	\$6,995
<b>1996</b>	725	1,000	\$16,388	\$9,364
<b>1997</b>	745	1,000	\$16,745	\$9,427
<b>1998</b>	745	1,825	\$10,538	\$16,808
<b>1999</b>	745	1,850	\$9,403	\$15,650
<b>2000</b>	745	1,850	\$8,249	\$13,728
<b>2001</b>	745	1,850	\$8,419	\$14,012
<b>2002</b>	745	1,850	\$11,712	\$13,090



**Cedar Waxwing**  
*USFWS photo*

The refuge also contributes to the local economy by generating tourism dollars. Tourism is the largest industry in Virginia. Preliminary domestic traveler spending in 1999 for Virginia is estimated at \$12.36 billion. Traveler spending represents direct spending by all travelers, including meals, lodging, public transportation, auto transportation, shopping, admissions, and entertainment. In 1997, Virginia was ranked 10th in the nation for domestic traveler spending. Combined visitation to 150 of Virginia's attractions, parks, and travel centers, however, was down 0.1 percent through December 2000. Attractions were down 2.4 percent statewide, but State/National park visitation was up 2.2 percent (Virginia Tourism Corporation 2001). Although National Wildlife Refuges are not included in the State/National park category, these figures illustrate a growing popularity in nature-based tourism.

Traveler spending in Northampton County in 1999 was estimated at \$48.4 million. However, Accomack County traveler spending was almost double, at \$98.1 million. There are approximately seven hotels and a dozen restaurants in Northampton County. Recent tourism initiatives, however, have included the promotion of bed-and-breakfast accommodations throughout the eastern shore, especially in Cape Charles. There is also an effort underway to create a cruise ship port-of-call in Cape Charles.

## Public Use

### Access

U.S. Route 13 and the Chesapeake Bay Bridge-Tunnel connect the Eastern Shore of Virginia to the major metropolitan areas of the east coast (see Table 3-5). Route 13 is a four-lane divided highway and a major north-south corridor on the Delmarva Peninsula for truck traffic. The Bridge-Tunnel is 17 miles long. Crossing over and under open waters where the Chesapeake Bay meets the Atlantic Ocean, the Bridge-Tunnel provides a direct link between southeastern Virginia and the Delmarva Peninsula, and cuts 95 miles from the journey between Virginia Beach and locations north of Wilmington, Delaware. The crossing consists of a series of low-level trestles interrupted by two 1-mile long tunnels. Construction of the original bridge began in September 1960 and the bridge opened for traffic in April 1964 (Eastern Shore of Virginia Economic Development Commission 2001). The toll to cross the bridge is \$10 each way, with a \$14 round-trip commuter fee levied in March 2002.

The Eastern Shore Railroad has more than 90 miles of track serving Accomack and Northampton Counties, and a 26-mile car float operation to cross the Chesapeake Bay from Cape Charles to Little Creek (Eastern Shore of Virginia Economic Development Commission 2001). Two carfloats of 18 and 25 car capacity are used over the water route. Commodities currently handled by the railroad include coal, stone, cement, grain, propane gas, paper, chemicals, fertilizer, food stuffs, and brick.

**Table 3-5.** Major metropolitan cities near the Eastern Shore of Virginia Refuge and the driving distance between the cities and the refuge (Eastern Shore of Virginia Economic Development Commission 2000).

City	Miles
Norfolk, VA	35
Richmond, VA	125
Baltimore, MD	140
Washington, D.C.	150
Philadelphia, PA	165
Raleigh, NC	225
New York, NY	290

Commercial air service is available from Norfolk International Airport, with service from several commercial airlines and air freight carriers. Accomack County Airport is located near the geographic center of the Eastern Shore of Virginia. The general aviation airport has a 5,000-foot concrete runway capable of accommodating most jet and prop aircraft.

### Refuge Visits

Visitation at the Eastern Shore of Virginia Refuge has increased dramatically since 1996. One of the reasons for the increased visitation is because, part-way through 1996, the refuge installed a traffic counter that helped refuge staff obtain a more accurate account of visitation. Before the traffic counter was installed, visitor numbers were largely underestimated (see Table 3-6). Another reason for the increase in visitation since 1996 is the completion of construction of the Visitor Center. Signs on Route 13 directing drivers to the refuge's Visitor Center have increased the visibility of the refuge, as well as the refuge's visitation.

In general, the refuge is not a destination point for most people, but rather a stop along the way to somewhere else. Many visitors to the Washington, D.C. area stop at the refuge on their way north or south. Some visitors are retirees who visit the refuge on their travel between their seasonal homes. Visitors come to the refuge for birdwatching, environmental education, trail walking, photography, and use of the boat ramp. Other visitors include military history buffs and groups of people who use the refuge's conference facilities. Most visits last 20 to 30 minutes. Visitor patterns, however, are expected to change with increased development in the area.

Currently, there is little tourism support in the area, but this could change with the construction of additional hotels, restaurants, and shopping centers. The refuge schedules educational programs for local school children throughout the year. Approximately 1,200 school children visited the Eastern Shore of Virginia Refuge in the 2000 school year.

**Table 3-6.** *Visitors to the Eastern Shore of Virginia Refuge.*

	1995	1996	1997	1998	1999
<b>Refuge Visits</b>	45,000	91,540	150,107	173,151	190,911
<b>Visitor Center Visits</b>	N/A <sup>2</sup>	21,000 <sup>1</sup>	28,463	29,160	30,758

<sup>1</sup> Due to construction, the Visitor Center was only open June through December 1996.

<sup>2</sup> The Visitor Center was closed in 1995 for construction.

### Hunting

The Eastern Shore of Virginia Refuge implemented a hunt program in 1993 as a means of keeping the white-tailed deer population in balance with refuge habitat, while also providing recreation benefits (USFWS 1993b). Approximately 200 acres are divided into five hunt zones that can accommodate a maximum of 23 hunters per day (see Map 3-2). The archery season is currently 12-days long with hunting from Monday through Saturday for two consecutive weeks. The hunt generally starts during the last week in October and ends in early November. Refuge trails and access to the refuge remain open during the archery hunt. The shotgun season lasts seven days with hunting on Wednesdays and Saturdays in November and December. Refuge trails are closed during the firearms hunt days and access through the refuge is by Special Use Permit only. There is no hunting on Fisherman Island Refuge.

### Fishing

There are no fishing opportunities on either refuge. However, we traditionally allowed access through the refuge to the former Wise Point Corporation property for recreational anglers and commercial watermen. Since the refuge has taken over ownership of that property, access for recreational anglers has been temporarily halted until improvements are made to the boat ramp and parking lot. Since commercial watermen depend on access to the boat ramp for their livelihood, the refuge has continued to allow access for them while boat ramp improvements are underway. There are 20 commercial watermen currently using the boat ramp. Commercial watermen are charged \$1,200 annually for a Special Use Permit (SUP), which supports up to four transferrable subpermits.



**Deer hunter with deer at check station.**

*USFWS photo*



**Table 3-7.** Statistics on the number of hunters at the Eastern Shore of Virginia Refuge, their success rates, and the number of deer taken.

	Archery			Shotgun			Total		
	1999	2000	2001	1999	2000	2001	1999	2000	2001
#Hunters	63	49	50	91	62	67	154	111	117
% Successful	26	37	44	10	19	22	18	27	32
Hunter Hours	930	1137	1134	805	795	817	1735	1932	1951
Deer Taken	17	18	22	9	12	15	26	30	37
Hours Per Deer	54.7	63.2	51.6	90	66.3	54.5	66.7	64.4	52.7

### Wildlife Observation and Photography



**Osprey.**

USFWS photo

The Eastern Shore of Virginia Refuge has a 1.5-mile trail system with two observation platforms, interpretive signs, and a kiosk. The trail starts at the Visitor Center with the Butterfly Trail and links to an interpretive trail that loops through mixed hardwoods past an old graveyard and up to the top of a World War II bunker which offers a panoramic view of refuge marshes, barrier islands, bays, inlets, and the Atlantic Ocean. The trails are open for walking only. The refuge also has an environmental education building, a conference building, and a photography blind that overlooks a freshwater pond. The refuge is open from half an hour before sunrise to half an hour after sunset. Visitors are prohibited from some activities, including metal detecting, picknicking, and collecting plants, animals, or artifacts.

There is an observation window in the Visitor Center overlooking a freshwater pond. The Visitor Center has binoculars and a spotting scope available for visitor use to observe wildlife. Behind the Visitor Center is a butterfly garden which provides opportunities to view and photograph butterflies.

Fisherman Island Refuge is open to the public for guided tours from October 15 through March 30. The island is closed the remainder of the year to protect colonial nesting birds from disturbance. Occasionally tours are given at other times of the year (i.e., International Migratory Bird Day). Visitors to Fisherman Island Refuge observe neotropical birds in the fall and many different species of waterfowl in the winter.

### Environmental Education and Interpretation

The Visitor Center offers exhibits and short videos on the important habitats of the area and wildlife management activities that occur on



the refuges. It also offers an auditorium where wildlife videos are shown.

Most of the elementary school children in Northampton County (approximately 1,000 students) annually receive one to two hours of education on conservation and migratory bird issues. Educational activities follow the State “Standards of Learning.” We also educate about 1,000 children from other schools, summer camps, and other clubs and organizations.

Visitors to Fisherman Island Refuge learn about the essential role the island plays in wildlife protection and its importance to harbor defense during both World Wars.

### **Public Use Opportunities Off-Refuge**

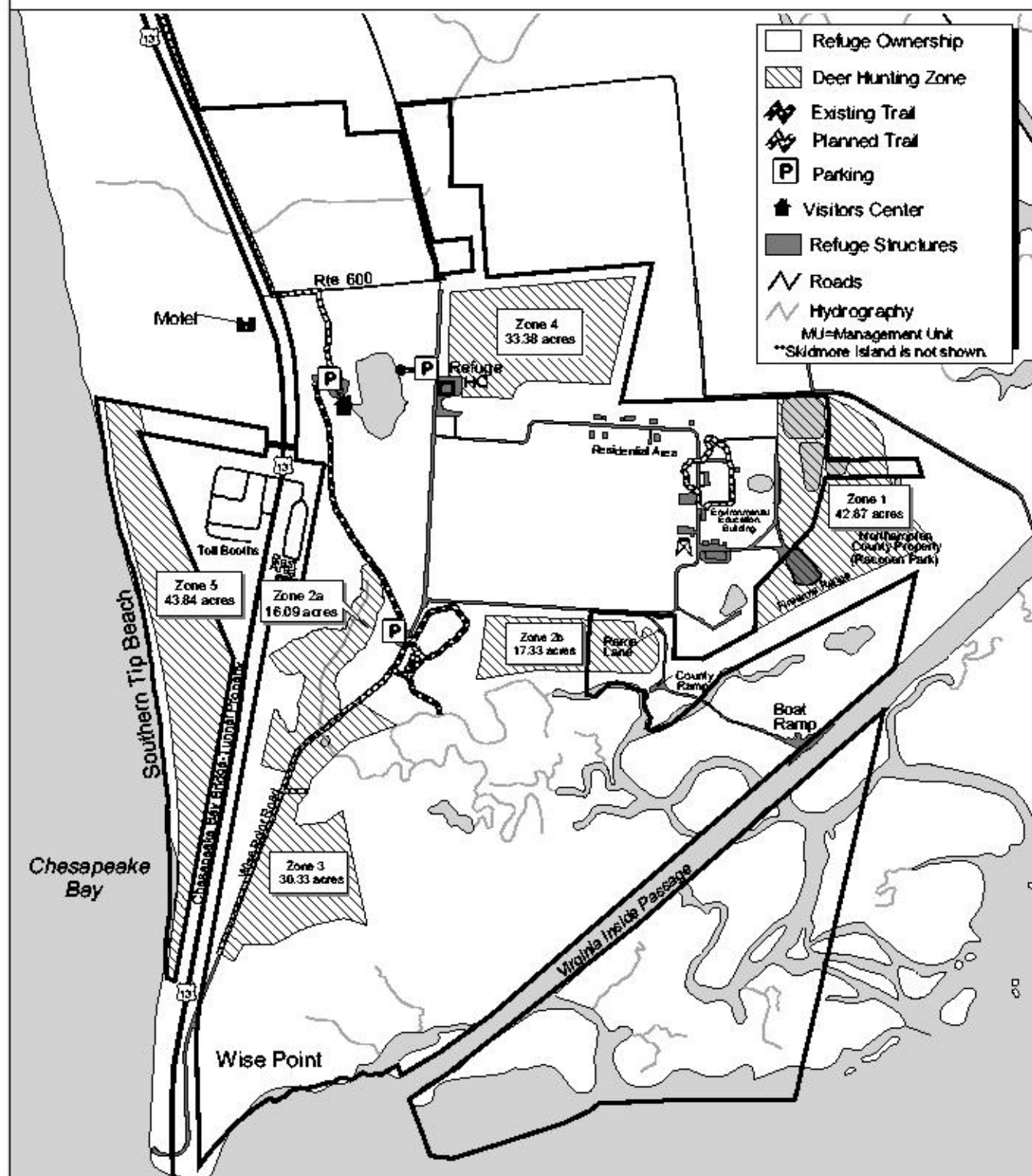
Three miles north of the refuge is Kiptopeke State Park. The 540-acre park is on the Chesapeake Bay and offers camping, swimming, boating, fishing, biking, hiking, picnicking, and interpretive programs.

About 10 miles north of the refuge is Cherrystone Campground, a family camping and recreational vehicle resort. Cherrystone is also on the Chesapeake Bay. The resort is about 300-acres in size and offers cottages, camping cabins, on-site trailer rentals, and tent rentals. Visitors can swim, fish, boat, kayak, shop, and golf.

Approximately 70 miles north is Chincoteague National Wildlife Refuge, Assateague Island National Seashore, the Virginia Space Flight Center (one of only three commercial rocket launch facilities in the United States), small towns filled with historic homes, and hundreds of miles of waterfront on the Chesapeake Bay and Atlantic Ocean.

# Deer Hunting Zones

## Eastern Shore of Virginia Refuge



**Data Sources:**  
1:24,000 Hydrography & 1:100,000 Road data provided by USGS with aerial data of 1981 & 1989. All other data provided by USFWS. Projection/Datum: UTM Zone 18, NAD 83, Meters.

Map prepared for the Eastern Shore of Virginia MWR & Fisherman Island MWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section, March 2003.

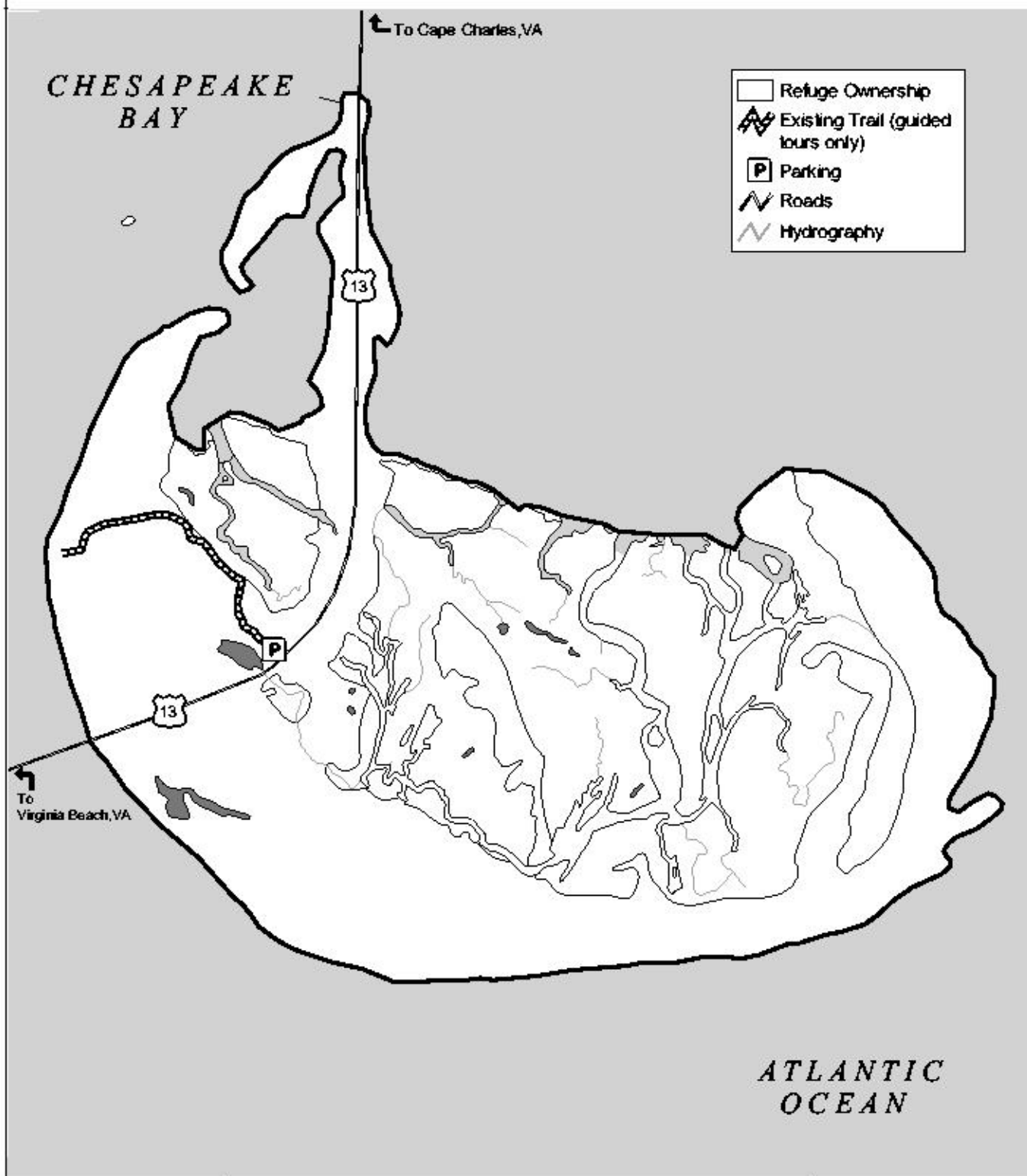
This map is for planning purposes only.

0 1000 2000 3000 4000 Feet

0 300 600 900 1200 Meters



# Existing Public Use Opportunities Fisherman Island Refuge



**Data Sources:**  
1:24,000 Hydrography & 1:100,000 Road data provided by USGS with source dates of 1981 & 1989. All other data provided by USFWS. Projection/Datum: UTM Zone 18, NAD 27. Meters.

Map prepared for the Eastern Shore of Virginia MWR & Fisherman Island MWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section. March 2003.

This map is for planning purposes only.



## Cultural Resources

A variety of federal laws require the U.S. Fish and Wildlife Service (Service) to identify and preserve important historic structures, archaeological sites, and artifacts. The National Environmental Policy Act (NEPA) mandates consideration of cultural resources in planning federal actions. The National Wildlife Refuge System Improvement Act calls for identification of the archaeological and cultural values of each refuge in the Comprehensive Conservation Plan (CCPs).

Federal agencies are also required, by the National Historic Preservation Act, to locate and protect historic resources (archaeological sites and historic structures eligible for or listed in the National Register of Historic Places, and museum property) on their land or on land affected by their activities. In addition, agencies are required to establish a program for these activities and to carry out their preservation activities in consultation with State Historic Preservation Offices. In Region 5, the Service's Regional Historic Preservation Officer oversees compliance with these laws and consults with the State Historic Preservation Offices in 15 states. In Virginia, this is the Virginia Department of Historic Resources.

According to the National Historic Preservation Act, site preservation depends on the National Register of Historic Places (National Register) eligibility, a measure of the site or structure's quality or importance. Federal agencies are also charged with locating, evaluating, and nominating sites on their land to the National Register. The Service maintains an inventory of discovered archaeological sites and historic structures in the Regional Office, with copies of the site files at each refuge.

We comply with the Archaeological Resource Protection Act, which requires protection of archaeological sites from vandalism and looting, and requires permits for site excavation. The Regional Historic Preservation Officer manages these activities.

We own and care for museum property. Archaeological collections, art, zoological and botanical collections, historical photographs, and historic objects are our most common types of museum property. Each refuge maintains an inventory of museum property. Museum property care on refuges is guided by the Regional Museum Property Coordinator who helps the Service comply with the Native American Grave Protection and Repatriation Act, as well as Federal regulations guiding curation of Federal archaeological collections. The program ensures that Service collections will continue to be available to people for learning and research.

### Eastern Shore of Virginia National Wildlife Refuge

Preservation of cultural resources depends on their eligibility for listing on the National Register of Historic Places. Eastern Shore of Virginia Refuge has had a professional archaeological survey completed to assess the eligibility of its known sites. The Virginia Department of Historic Resources has been consulted with reference to this work. In addition, the refuge has maps of land forms likely to need survey if ground disturbance is necessary.

The end result of this work has proven that the refuge has one National Register eligible farmstead. In addition, there are structural remains of Fort John Custis, part of the Chesapeake Bay Harbor Defenses, which may be eligible for the National Register. Nine other known sites, including two cemeteries, have been evaluated for eligibility for the National Register. None of these sites are eligible.

### Fisherman Island National Wildlife Refuge

#### *Previous Archaeological Work*

Because Fisherman Island consists of modern (post 1820) deposits, the Virginia Department of Historic Resources concurred in 1992 with Espey, Huston and Associates that no archaeological survey was justified on the island unless archival sources suggested historic use of the area. Therefore, the firm's study of the Parallel Crossing Proposal did not include work on Fisherman Island. In 1975, however, a team of museum and military professionals examined structural remains of Fort John Custis on Fisherman Island (Virant 1975). In 1994, Matthew L. Adams and Christopher K. Wiles also visited Fisherman Island and reported on the condition of the Fort John Custis structures (Adams 1994). No archaeological or professional architectural survey has been conducted on Fisherman Island.

Known cultural resources on Fisherman Island consist of four structures remaining from Chesapeake Bay Harbor Defenses for World War II—gun emplacements and the activities related to their support. In addition, one standing cabin is related to hunting and fishing on the island. Sites of cabins from the late 19<sup>th</sup> and early 20<sup>th</sup> century may exist as well. No cultural resources on Fisherman Island have as yet been evaluated for National Register eligibility.

## **Appendix A**

### **Trust Resources and Other Species and Habitats of Special Management Concern**



## Codes used in Species Lists

### Global Rank (from the Nature Conservancy)

G1 - Extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 - Very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.

G3 - Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.

G4 - Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery.

G5 - Very common and demonstrably secure globally, though it may be rare in parts of its range, especially at the periphery.

GH - Formerly part of the world's fauna with some expectation that it may be rediscovered; generally applies to species that have not been verified for an extended period (usually >15 years) and for which some inventory has been attempted recently.

GX - Believed to be extinct throughout its range with virtually no likelihood of rediscovery.

GU - Possibly rare, but status uncertain and more data needed.

G? - Unranked, or, if following a ranking, rank uncertain (e.g., G3?).

G\_G\_ - The rank is uncertain, but considered to be within the indicated range of ranks (also, T\_T\_).

G\_Q - Taxon has a questionable taxonomic assignment (e.g., G3Q).

G\_T\_ - Signifies the rank of a subspecies (e.g., G5T1 would apply to a subspecies if the species is demonstrably secure globally (G5) but the subspecies warrants a rank of T1, critically imperiled.)

## State Rank

S1 - Extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals in Virginia; or because of some factor(s) making it especially vulnerable to extirpation in Virginia.

S2 - Very rare and imperiled with 6 to 20 occurrences or few remaining individuals in Virginia; or because of some factor(s) making it vulnerable to extirpation in Virginia.

S3 - Rare to uncommon in Virginia with between 20 and 100 occurrences; may have fewer occurrences if found to be common or abundant at some of these locations; may be somewhat vulnerable to extirpation in Virginia.

SH - Formerly part of Virginia's fauna with some expectation that it may be rediscovered; generally applies to species that have not been verified in the state for an extended period (usually >15 years) and for which some inventory has been attempted recently.

SX - Believed to be extirpated from Virginia with virtually no likelihood of rediscovery.

SR - Reported for Virginia, but without persuasive documentation that would provide a basis for either accepting or rejecting the report.

SU - Possibly rare, but status uncertain and more data needed.

S\_? - Rank uncertain. For example the rank S2? denotes a species that may range from S1 to S3.

S\_S\_ - Rank is uncertain, but considered to be within the indicated range of ranks.

S\_B/S\_N - Breeding and nonbreeding status of an animal (primarily used for birds) in Virginia, when they differ.

SZN - Long distance migrant whose occurrences outside of the breeding season are not monitored or a species whose wintering populations are transitory and usually do not occur regularly at specific localities.

SN? - Long distance migrant that has been recorded north and south of Virginia waters and should eventually be found along the coast of Virginia.

SA - State accidental; not a regular member of the Virginia fauna but recorded in the state at least once.

## **Federal Status**

LE - Listed Endangered. A taxon threatened with extinction throughout all or a significant portion of its range.

LT - Listed Threatened. A taxon likely to become endangered in the foreseeable future.

LT/SA - Listed as Threatened due to Similarity of Appearance. The species so closely resembles an endangered or threatened species or population that enforcement personnel of the U.S. Fish and Wildlife Service cannot readily distinguish between the taxa (e.g., the northern population of the bog turtle is federally listed as endangered, but turtles from the southern population, which includes Virginia, are not readily distinguishable from them).

LT/PDL - Listed as Threatened but proposed for delisting. The U.S. Fish and Wildlife Service has proposed that this species be removed from the list of Endangered and Threatened wildlife. However, at the present time, the species is still listed as Threatened pending further action and is thus protected under the Endangered Species Act.

PE - Proposed Endangered. A taxon proposed for listing as endangered.

PT - Proposed Threatened. A taxon proposed for listing as threatened.

C - Candidate. There is enough available information to propose the species for listing, but listing is “precluded by other pending proposals of higher priority”. (Formerly Candidate, Category 1)

## **State Status**

LE - Listed Endangered; defined as a species that is in danger of extinction throughout all or a significant portion of its range.

LT - Listed Threatened; defined as a species that is likely to become endangered within the foreseeable future.

SC - Special Concern; animals that merit special concern according to the Virginia Department of Game and Inland Fisheries. This is not a legal category.

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<b>RARE PLANTS</b> (Townsend 2001)					
<i>Amaranthus pumilus</i> Raf.	Seabeach amaranth	G2	SH	LT	
<i>Chamaesyce bombensis</i> (Jacq.) Dugand = <i>Euphobia ammannioides</i> Kunth	Southern sea sponge	G4G5	S2		
<i>Paspalum distichum</i> L.	Joint paspalum	G5	S1		
<i>Physalis walteri</i> Nutt	Dune ground-cherry	G4	S2		
<i>Rhynchospora colorata</i> (L.) H. Pfeffer	White-topped sedge	G5	S1		
<b>Plant species on the State's Division of Natural Heritage's watch list</b>					
<i>Aristida tuberculosa</i> Nutt.	Seabeach needlegrass	G5	S3		
<i>Bacopa monnieri</i> (L.) Pennell	Coastal water-hyssop	G5?	S3		
<i>Ilex vomitoria</i> Ait.	Yaupon holly	G5	S3		
<i>Lechea maritima</i> Leggett ex B.S.P. var. <i>virginica</i> Hodgson	Virginia beach pinweed	G5T3Q	S3		
<i>Leptochloa fascicularis</i> (Lam.) Gray var. <i>maritima</i> (Bickn.) Gleason	Long-awned sprangletop	G5T3T4	S3		
<i>Oenothera oakesiana</i> (Gray) J.W. Robbins ex S. Wats. & Coult.	Evening primrose	G4G5Q	SU		
<i>Polygonella articulata</i> (L.) Meisn.	Eastern jointwood	G5	S3		
<i>Sesuvium maritimum</i> (Walt.) B.S.P.	Sea-purslane	G5	S3		
<i>Suaeda linearis</i> (Ell.) Moq.	Tall sea blite	G5	S3		
<i>Uniola paniculata</i> L.	Sea oats	G5	S3		
<i>Zanthoxylum clava-herculis</i> L.	Southern prickly-ash	G5	S3		
<b>RARE ANIMALS</b> (Roble 2001)					
<b>FISH</b>					
<i>Acipenser oxyrinchus</i>	Atlantic sturgeon	G3	S2	SC	
<b>REPTILES</b>					
<i>Caretta caretta</i>	Loggerhead sea turtle	G3	SIB, S1N	LT	LT
<i>Lepidochelys kempii</i>	Kemp's Ridley sea turtle	G1	S1N	LE	LE

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<b>BIRDS</b>					
<i>Accipiter cooperii</i>	Cooper's hawk	G5	S2B/S3N		
<i>Actitis maculara</i>	Spotted sandpiper	G5	S2B/SZN		
<i>Aegolius acadicus</i>	Northern saw-whet owl	G5	S1B/S1N		SC
<i>Ammodramus caudacutus</i>	Saltmarsh sharp-tailed sparrow	G4	S2B/S3N		SC
<i>Ammodramus henslowii</i>	Henslow's sparrow	G4	S1B		LT
<i>Anas discors</i>	Blue-winged teal	G5	S1B/S2N		
<i>Anas strepera</i>	Gadwall	G5	S2B/S3N		
<i>Aquila chrysaetos</i>	Golden eagle	G5	SHB/S1N		
<i>Ardea alba</i>	Great egret	G5	S2B/S3N		SC
<i>Asio flammeus</i>	Short-eared owl	G5	S1B/S3N		
<i>Asio otus</i>	Long-eared owl	G5	S1		SC
<i>Bartramia longicauda</i>	Upland sandpiper	G5	S1B/SZN		LT
<i>Botaurus lentiginosus</i>	American bittern	G4	S1B/S2N		
<i>Carpodacus purpureus</i>	Purple finch	G5	S1B/S5N		SC
<i>Catharus guttatus</i>	Hermit thrush	G5	S1B/S5N		SC
<i>Catharus ustulatus</i>	Swainson's thrush	G5	S1B/SZN		
<i>Certhia americana</i>	Brown creeper	G5	S2S3B/S5N		SC
<i>Charadrius melodus</i>	Piping plover	G3	S2B/S1N	LT	LT
<i>Charadrius wilsonia</i>	Wilson's plover	G5	S1B/SZN		LE
<i>Chondestes grammacus</i>	Lark sparrow	G5	SHB/SZN		
<i>Circus cyaneus</i>	Northern harrier	G5	S1S2B/S2S4N		SC
<i>Cistothorus platensis</i>	Sedge wren	G5	S1B/S1S2N		SC
<i>Contopus borealis</i>	Olive-sided flycatcher	G4	SHB/SZN		
<i>Dendroica fusca</i>	Blackburnian warbler	G5	S2B/SZN		
<i>Dendroica magnolia</i>	Magnolia warbler	G5	S2B/SZN		SC
<i>Dolichonyx oryzivorus</i>	Bobolink	G5	S1B/SZN		
<i>Egretta caerulea</i>	Little blue heron	G5	S2B/S3N		SC

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Egretta thula</i>	Snowy egret	G5			
<i>Egretta tricolor</i>	Tricolored heron	G5	S2B/S3N		SC
<i>Empidonax alnorum</i>	Alder flycatcher	G5	S1B/SZN		SC
<i>Empidonax flaviventris</i>	Yellow-bellied flycatcher	G5	S1B/SZN		SC
<i>Eudocimus albus</i>	White ibis	G5	S1B/SAN		
<i>Falco peregrinus</i>	Peregrine falcon	G4	S1B/S2N		LE
<i>Fulica americana</i>	American coot	G5	S1BS5N		
<i>Gallinula chloropus</i>	Common moorhen	G5	S1B/S1N		SC
<i>Haliaeetus leucocephalus</i>	Bald eagle	G4	S2B/S3N	LT/PDL	LE
<i>Himantopus mexicanus</i>	Black-necked stilt	G5	S1B		
<i>Ictinia mississippiensis</i>	Mississippi kite	G5	S1B		
<i>Ixobrychus exilis</i>	Least bittern	G5	S2S3B/S3N		
<i>Lanius ludovicianus</i>	Loggerhead shrike	G4	S2B/S3N		LT
<i>Laterallus jamaicensis</i>	Black rail	G4	S2B/S2N		
<i>Limnothlypis swainsonii</i>	Swainson's warbler	G4	S2B/SZN		SC
<i>Loxia curvirostra</i>	Red crossbill	G5	S1B/SZN		SC
<i>Melospiza georgiana</i>	Swamp sparrow	G5	S1B/S4S5N		
<i>Mergus merganser</i>	Common merganser	G5	S1B/S4N		
<i>Nyctanassa violacea</i> = <i>Nycticorax violaceus</i>	Yellow-crowned night-heron	G5	S2B/S3N		SC
<i>Nycticorax nycticorax</i>	Black-crowned night-heron	G5	S2S3B/S4N		
<i>Oporonis philadelphia</i>	Mourning warbler	G5	S1B/SZN		SC
<i>Pelecanus occidentalis</i>	Brown pelican	G4	S1B/S3N		SC
<i>Phalacrocorax auritus</i>	Double-crested cormorant	G5	S1B/S4N		
<i>Plegadis falcinellus</i>	Glossy ibis	G5	S2B/S1N		SC
<i>Podilymbus podiceps</i>	Pied-billed grebe	G5	S2B/S3N		
<i>Porzana carolina</i>	Sora	G5	S1B/S2N		
<i>Rallus elegans</i>	King rail	G4G5	S2B/S3B		
<i>Rallus limicola</i>	Virginia rail	G5	S2B/S3N		



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Regulus satrapa</i>	Golden-crowned kinglet	G5	S2B/S5N		SC
<i>Rynchops niger</i>	Black skimmer	G5	S2B/S1N		
<i>Sitta canadensis</i>	Red-breasted nuthatch	G5	S2B/S4N		SC
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker	G5	S1B/S4N		
<i>Sterna antillarum</i>	Least tern	G4	S2B/SZN		SC
<i>Sterna caspia</i>	Caspian tern	G5	S1B/S2N		SC
<i>Sterna maxima</i>	Royal tern	G5	S2B/SZN		
<i>Sterna nilotica</i>	Gull-billed tern	G5	S2B/SZN		LT
<i>Sterna sandivicensis</i>	Sandwich tern	G5	S1B/SZN		SC
<i>Troglodytes troglodytes</i>	Winter wren	G5	S2B/S4N		SC
<i>Vermivora ruficapilla</i>	Nashville warbler	G5	S1B/SZN		
<b>MAMMALS</b>					
<i>Sylvilagus floridanus hitchnsi</i>	Smith Island cottontail	G5THQ	SH		
<b>ODONATA (Dragonflies &amp; Damselflies)</b>					
<i>Anax longipes</i>	Comet darner	G5	S2S3		
<i>Celithemis verna</i>	Double-ringed pennant	G5	S2S3		
<i>Cordulegaster diastatops</i>	Delta-spotted spiketail	G5	S1		
<i>Enallagma dubium</i>	Burgundy bluet	G5	S2		
<i>Nannothemis bella</i>	Elfin skimmer	G4	S1		
<i>Nehalennia gracilis</i>	Sphagnum sprite	G5	S2		
<i>Nehalennia intergricollis</i>	Southern sprite	G5	S2		
<i>Somatochlora filosa</i>	Fine-lined emerald	G5	S2		
<i>Somatochlora provocans</i>	Treetop emerald	G4	S2		
<i>Sympetrum janae</i>	Jane's meadowhawk	G5	SH		
<b>COLEOPTERA (Beetles)</b>					
<i>Cicindela dorsalis dorsalis</i>	Northeastern beach tiger beetle	G4T2	S2	LT	
<i>Cicindela trifasciata</i>	Tiger beetle	G5	S1		

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<b>HETEROPTERA</b>					
<i>Bothynotus johnstoni</i>	Mirid bug	G3	S1S3		
<i>Botocudo modestus</i>	Seed bug	G5	S1S3		
<i>Pycnoderiella virginiana</i>	Seashore plant bug	GU	SU		
<i>Ploiaria carolina</i>	Carolina thread-legged bug	G4?	S1S3		
<i>Ploiaria hirticornis</i>	Assassin bug	G3?	S1S3		
<i>Pnirontis brimleyi</i>	Assassin bug	G2	S1S3		
<i>Ramphocorixa acuminata</i>	Acuminate water boatman	G4	S1		
<i>Ranatra drakei</i>	Drake's water scorpion	G4	S1S3		
<b>LEPIDOPTERA</b>					
<b>Butterflies and skippers</b>					
<i>Caliphelis virginiensis</i>	Little metalmark	G4	S1S2		
<i>Callophrys irus</i>	Frosted elfin	G3	S1		
<i>Lycaena hyllus</i>	Bronze copper	G5	S1		
<i>Megathymus yuccae</i>	Yucca giant skipper	G4	SH		
<b>Moths</b>					
<i>Drasteria graphica atlantica</i>	Atlantic graphic moth	G4T4	S1S3		
<i>Faronta rubripennis</i>	Pink-streak moth	G3G4	S1S3		
<i>Meropleon cosmion</i>	Noctuid moth	G4	S1S3		
<i>Papaipema araliae</i>	Aralia shoot borer moth	G3G4	S2S3		
<i>Papaipema duovata</i>	Seaside goldenrod borer moth	G4	S1S3		
<i>Papaipema stenocelis</i>	Chain fern borer moth	G4	S1S3		
<i>Papaipema speciosissima</i>	Osmunda stern borer moth	G4	S1S3		
<i>Schinia siren</i>	Flower moth	G?	S1S2		

## **Appendix B**

# **Response to Public Comment on Draft CCP/EA**

## **Summary of, and the Service's Response to, Public Comments Received on the Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) for Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges.**

**April 2004**

### **Introduction**

In March 2003, we completed the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges (NWRs). The Draft CCP/EA outlined four alternative scenarios for managing the two refuges over the next 15 years. We identified Alternative B as the "Service's Proposed Action" in this document. It is the alternative we recommended to best achieve the Refuge System mission, and refuge purposes and goals. The Draft CCP/EA was released for 45 days of public review from September 26 to November 10, 2003.

We have evaluated all written and oral correspondence received during the public comment period. This document is our response to the substantive comments we received. Based on the analysis in the Draft CCP/EA, and our evaluation of public comments, we have modified our Proposed Action to include the following changes:

- 1) We will complete a wilderness review on both the Eastern Shore of Virginia and Fisherman Island NWRs within three years of final CCP approval;
- 2) We will also evaluate Skidmore and Fisherman Islands for their Research Natural Area potential within three years of final CCP approval;
- 3) We will coordinate with other authorities to ensure Formerly Used Defense Sites (FUDS) are secure and do not pose a safety hazard before we allow unrestricted access in their vicinity; and
- 4) We will modify our habitat prescription in Management Unit 8 on Eastern Shore of Virginia NWR to promote a shrub habitat type.

We will ask our Regional Director to review and approve the revised Proposed Action which we have developed into a final CCP. It is also required that the Director review and approve or deny the Land Protection Plan (LPP). If both are approved, the Regional Director will issue a Finding of No Significant Impact (FONSI). The FONSI is the decision document that certifies that the final CCP will have no so significant impact on the human environment, therefore, allowing us to begin the implementation phase.

### **Summary of Comments Received**

A total of 33 individuals, agencies, and organizations provided comments by way of oral testimony at public hearings or through submission of written or electronic documents.

We held 3 formal public hearings as follows:

October 8, 2003, 6:30-9:00 p.m., Lake Wright Inn, Norfolk, VA

October 9, 2003, 2:00-4:00 p.m., Northampton High School auditorium, Eastville, VA

October 9, 2003, 6:30-9:00 p.m., Northampton High School auditorium, Eastville, VA

Nine oral testimonies were given at the public hearings; 1 in Norfolk and 8 in Eastville. Some people at the public meetings submitted their comments in writing instead of giving oral testimony, while others did both. Written responses came in the form of letters and electronic mail.

We received 9 written comments from local and State Governments, including:

- Board of Supervisors of Northampton County
- VA Department of Game and Inland Fisheries
- VA Department of Environmental Quality
- VA Department of Conservation and Recreation
- VA Marine Resources Commission
- VA Department of Historic Resources
- Virginia Institute of Marine Science
- Chesapeake Bay Local Assistance Department
- Accomack-Northampton Planning District Commission

We received 4 written comments from local and national conservation and recreation organizations, including:

- The Wilderness Society
- The Nature Conservancy
- Citizens for a Better Eastern Shore
- Coastal Virginia Wildlife Observatory

We received 11 written responses from individuals, including:

- 6 written comments from the public hearings
- 2 electronic mailings
- 3 written letters

In the following discussions, we identify the issues and comments raised during public scoping and our responses to them. We make some references to the full-text version of the Draft CCP/EA. The full-text version is available on-line at <http://northeast.fws.gov/planning>. For a paper copy, call Eastern Shore of Virginia National Wildlife Refuge Headquarters at (757) 331-2760.

### **Habitat and Wildlife Management**

**Comment:** The Virginia Institute of Marine Science (VIMS) asked the Service to delineate, map and create a management plan for all non-tidal wetlands in the current and proposed acquisition boundary. According to VIMS, these non-tidal wetlands play an important role for wildlife and ecological functions, and are increasingly threatened by development. “Unless identified and prioritized for acquisition,” wrote VIMS, “the refuge may miss opportunities to include these areas and their unique contributions to the ecosystem.”

**Response:** We appreciate VIMS perspective and confirmation of the important functions the wetland habitats provide. The Service’s National Wetlands Inventory program has delineated and mapped all tidal and non-tidal wetlands for Northampton and Accomack Counties. They are increasingly threatened by drainage, conversion, and development. Measurements in the draft LPP (Draft CPP/EA, Appendix K) show that approximately 23% of the proposed acquisition area is wetland, as follows: forested wetland, 460 acres (8%); tidal marsh, 725 acres (12%); open water, 120 acres (2%); and shrub/freshwater marsh/wet meadow, 25 acres (<1%). The final LPP is Appendix E in this final CCP.

The majority of wetland acreage proposed for acquisition is located on lands designated Priority 2; one of four LPP priority categories defined in the LPP. Any lands that become available within this area will give us the opportunity to protect and manage significant tracts of wetland, and offer the potential for wetland restoration where former wetland/hydric soils have been cleared and converted to low-lying farmland.

**Comment:** The Wilderness Society (Society) asked that we expand our discussion of the National Wildlife Refuge System Improvement Act of 1997 (NWRSA) in Chapter 1 to include specific wording on our responsibility to “maintain the biological integrity, diversity and environmental health of each refuge” and to “monitor the status and trends of fish, wildlife and plants on each refuge.” The Society also requested that we indicate how the Service will accomplish these responsibilities under each alternative. Furthermore, the organization recommended a “separate monitoring and evaluation appendix that lays out the purpose, observation timeline, specific questions, and specific protocol for each monitoring action on both refuges. A strong monitoring and evaluation program is the key to good refuge management.”

**Response:** Our reference to the NWRSA in Chapter 1 was made to give context for why we are completing a CCP. There are many other elements of the NWRSA that could be referenced, including the clauses related to monitoring and biological integrity, diversity, and environmental health. Section 5 of the NWRSA lists 14 separate mandates the Secretary must meet in administering the System. The Draft CCP/EA addressed the majority of the mandates found in the NWRSA.

We agree that monitoring and evaluating our actions is vital to making sound, science-based management decisions. Our final CCP will commit us to completing an Inventory and Monitoring Plan (IMP) by 2006. The IMP is a step-down management plan required by Service Policy 701 FW 2, Inventory and Monitoring of Populations. The IMP guides the collection of data on species of management concern to the refuges. Moreover, all strategies in the draft CCP/EA that mentioned monitoring will be included in the IMP. A Habitat Management Plan (HMP) is another required step-down plan, which we will complete prior to the IMP in 2005. It will finalize habitat management schedules and strategies from which many inventory and monitoring protocols will be determined.

**Comment:** The Society commented on our use of the term “federal trust resources,” to refer to endangered species, migratory birds, and inter-jurisdictional fish species. They said it is inappropriate for us to focus management on “federal trust resources” because the Service’s mission statement mandates we protect all fish, wildlife, and plants on national wildlife refuges.

**Response:** “Trust resources,” is a term used within the Service to refer to species whose welfare is specifically entrusted to the Service by statute or treaty. The Service’s management for the other resident wildlife on national wildlife refuges emphasizes the protection of breeding stocks and the production of native wildlife to achieve or maintain species diversity which naturally occurs or historically occurred on refuges. The special interest of various States in managing resident wildlife is recognized and we coordinate with respective State management objectives, where possible.

**Comment:** The Society called “overly simplistic” our assertion in the draft CCP/EA (p. 4-72) that Alternative D’s emphasis on forested habitat would have a “negative impact on habitat diversity.” Conserving biological diversity does not necessarily mean maximizing species richness; instead, it could mean restoring and maintaining a single habitat or species that is suffering severe or rapid declines in the region.

**Response:** The reference in the Draft CCP/EA is to the diversity of habitat types on the refuge, not to biological diversity. The Society correctly notes that contributing to biological diversity can mean simplifying a landscape to a single vegetative community, if that is all that should naturally occur there. While Alternative D would make the greatest contribution of the four alternatives to natural biological diversity within the lower Delmarva Peninsula, it would still simplify the number of habitat types found within refuge boundaries.



**Comment:** The Society recommended that the final CCP contain more information on the regional ecological context within which the refuges are located. Such information should include historic habitat types, current and future habitat trends, and habitat needs for rare and declining species. The Society stated that, in the absence of this information the Service should focus on “maintaining and restoring the natural dynamics of the ecosystem.” Further, the Society said the Service could make a case for Alternative B; however, “by demonstrating in the plan that shrub and grasslands habitat not provided for under Alternative D are critically important and that the refuge can play a substantive role in providing those habitats.” Finally, the Society recommended these habitat management decisions be made in the context of the LPP.

**Response:** The Draft CCP/EA recognizes that we do not have extensive information on the historical ecological context and ecological dynamics. We believe, however, that the Draft CCP/EA contains the information necessary to provide a regional ecological planning context for the refuges. There is extensive information concerning species, habitat needs, and the role of the refuges in the various descriptions of other ongoing, landscape-scale planning initiatives (e.g., Partners in Flight), described in Draft CCP/EA (Chapter 1). Chapter 3 also discussed historic and current land use trends, and notes the continued habitat degradation predictable from further development. It also contains descriptions of wildlife present in the area.

Choosing Alternative B as the Proposed Action is based on the hemispheric importance of the refuge to Neotropical and temperate migrants that rely on the complex of habitats, especially the hardwood understory, shrubs, grasslands, and the food sources that they represent. This justification is found most readily in the Vision Statement (Draft CCP/EA, Chapter 1) and in the rationales for the objectives in Chapter 2 (Draft CCP/EA, Alternative B, Goal 1). Finally, we contend that the LPP does put the habitat decisions in context of their importance.

**Comment:** The Society commented that one of the plans “principal shortfalls is that it does not contain a wilderness review. The Plan not only fails to examine whether refuge lands currently qualify for wilderness designation, but the Plan also fails to dictate when the Service will conduct a formal wilderness review.”

**Response:** A site visit to assess wilderness characteristics of both refuges was conducted in 1999. When examining Fisherman Island Refuge, we discussed the need to further evaluate the impacts caused by the artificial structures such as the four-lane highway that cuts through the island. A small road also exists on the island, which allows access by refuge staff and researchers. We did not complete our review and concluded that a more in-depth study is needed. Therefore, the final CPP will require that we complete a wilderness review of both refuges within three years of CCP approval.

**Comment:** The Society recommends designating Fisherman Island and Skidmore Island as Research Natural Areas, as proposed in Alternative D.

**Response:** We agree that these islands should be evaluated for their Research Natural Area potential. As such, the final CCP will require that we conduct this evaluation concurrent with the wilderness review. It will be completed within the same time frame; that is, three years after CPP approval.

**Comment:** One individual asked what qualifies as “wildlife.”

**Response:** The NWRSA provides a formal definition in Section 5(7): “The terms ‘fish,’ ‘wildlife,’ and ‘fish and wildlife,’ mean any wild member of the animal kingdom whether alive or dead, and regardless of whether the member was bred, hatched or born in captivity, including a part, product, egg, or offspring of the member.”

**Comment:** A private resource manager had several comments on our proposed vegetation management. He suggested focusing on the elimination of invasive plant species as the first step in trying to develop desired habitat conditions. In addition, he suggested developing Management Unit 8 (MU-8) into a maritime evergreen/loblolly vegetation community rather than a hardwood forest community, as proposed in Alternative B, to be more consistent with the surrounding habitat types. Finally, this individual suggested converting MU-3 to grassland habitat, rather than shrub habitat, since it is the southernmost field on the peninsula and is surrounded by mature forest that provides a shelter or stopover area for migrating birds and butterflies.

**Response:** We appreciate the reviewer's concerns with the need to control, if not eliminate, invasive plants. Control of invasive plants is a national priority for the NWRs. Elimination of invasive plants will be a management priority in areas where these plant species have a stronghold (Draft CCP/EA, Alternative B, Goal 1). With regards to MU-8, upon further review, we would manage most of this area as shrub because of the wetter soils and high salt spray. However, on a small area, where the elevation is higher and soils are drier, we will manage it as hardwood forest. This management strategy will be reflected in the final CCP and HMP.

With regards to the suggested change of MU-3, we described in the Draft CCP/EA (Chapter 3) that research shows a minimum field size is important for migrating and wintering grassland-dependent birds. Additionally, its location on the tip of the peninsula is not critical to grassland migratory birds. This MU is approximately 1 hectare in size and does not meet the minimum useful size (10 hectares) for this suite of species. However, its location is critical for Neotropical migrant birds and will provide critical food sources if it is maintained in shrub/scrub. Therefore, we believe maintaining this area as shrub/scrub fills its highest and best use for migrant birds in the area.

### **Land Protection**

**Comment:** The Virginia Department of Game and Inland Fisheries (VDGIF) wrote; "The acquisition of 2,500 acres of land (1,500 acres targeted for grasslands restoration and 1,000 acres within the areas identified by the Delmarva Conservation Corridor analysis) between the 10 km zone and the town of Cape Charles as stated in the 1999 Preliminary Project Proposal (PPP) has been eliminated in the draft CCP. The primary purpose of acquiring these lands was to provide grassland-obligate bird species with early successional migration, winter and breeding habitats. We feel that the purchase of the 2,500 acres represented an essential component in the PPP's land acquisition plan and strongly recommend that it be included in the final CCP.

**Response:** We appreciate the opportunity to clarify our land protection proposal. First, we assure you that the original 2,500 acres identified as 'hubs' and grasslands in the PPP have not been entirely eliminated.

As the name suggests, the PPP identifies a preliminary proposed. Upon receiving the Director's approval in May 2001, we were given consent to prepare a more detailed LPP. Our PPP acreage estimate for lands within the 10-km zone study area was 4,000 acres. This estimate excluded existing conservation lands, major subdivisions and villages. The PPP also proposed land protection between the 10-km zone and Cape Charles, including 1,000 acres of "hub" habitat (primarily the Plantation Creek marsh/forest complex), and a grassland restoration target of 1,500 acres (recommended during a biological experts' workshop). This was an estimated project total of 6,500 acres.

The LPP's refined acquisition area extends north of the 10-km zone on the bayside, to include part of the Plantation Creek hub (lands between Cheapside and Plantation Creek). Meetings with the major landowner north of Plantation Creek made it clear that lands on the north side would never be available, so they were not included. We also slightly widened the original 1.5 km strip so that the proposal corresponded with property

boundaries and identifiable features (Routes 645 and 600).

We originally sought to incorporate grassland restoration as a “floating” target acreage, rather than identify specific tracts, to be restored (from farmland) between the 10-km zone and Cape Charles. Grassland habitat need not be within the 10-km zone to benefit grassland bird species. However, current Service guidance on preparing LPPs requires identification of specific tracts proposed for acquisition.

Rather than eliminate this acreage from the proposal, we accommodated a portion of it in the LPP by expanding the 10-km zone to the north, widening it to have distinctive features on the ground, and by including an objective for the 6,030-acre expansion area “to restore several large grassland tracts from agricultural lands as opportunities occur, to provide migration, breeding and wintering habitat for declining grassland bird species.” There are over 3,000 acres of farmland within the LPP boundary, and some of this acreage will be restored to grassland as opportunities arise. The only difference is that these grasslands will be within the 6,030-acre boundary.

In summary, the LPP boundary, while reduced from the original 6,500-acre proposal, now measures approximately 6,030 acres. The potential to restore grassland has been incorporated into the 10-km acquisition boundary. The boundary has been expanded further north to include some hub acreage, is slightly wider than the 1.5 km zone, and still allows for grassland restoration.

**Comment:** The Virginia Department of Conservation and Recreation and the Virginia Department of Environmental Quality’s Water Division both wrote in support of the LPP. The LPP “will likely result in the protection of large areas of surface waters and key habitat for threatened and endangered species as well as additional species of concern,” wrote the Water Division. The Virginia Coastal Program encouraged the Service to “maximize the amount of land under consideration for acquisition on the [southern] tip.” The Coastal Program suggested extending the land protection boundary as far north as possible “given the probability that many landowners in the far southern tip may not be willing to sell.”

**Response:** We appreciate your support for the LPP and recognize the efforts your agencies have achieved to protect some of these same habitats and resources on the lower Eastern Shore of Virginia. Concerning the northward extension of our proposed boundary, please see our response to VDGIF above.

**Comment:** The Virginia Marine Resources Commission (VMRC) reminded us that it manages all ungranted shores of sea, marsh and meadowlands. This includes 28,507 acres of ungranted state lands on Virginia’s Eastern Shore, of which 27,722 acres are located on the seaside between the barrier islands and the mainland. The rest is located on the Chesapeake Bay side.

**Response:** We recognize the State’s jurisdiction and authority on all ungranted lands under the Code of Virginia, Article 2 (§ 28.2-1503 et Seq.). We have reviewed the accompanying map submitted with this comment, which identifies ungranted lands in the project area, and will request a meeting with the VMRC for clarification on certain areas.

**Comment:** One individual, as well as Costal Virginia Wildlife Observatory (CVWO), The Nature Conservancy (TNC), and the Wilderness Society (Society) supported the Service’s proposal to expand the refuge for purposes of protecting additional wildlife habitat. The Northampton County Board of Supervisors also supported the LPP and encouraged the Service to work with its citizens “to develop a land acquisition program that is voluntary and mutually beneficial to all.”

TNC noted that the Alternative B expansion would support the efforts of the Southern Tip Partners group, a

partnership of local representatives and Service employees that has promoted and facilitated protection of the area's natural resources while encouraging sustainable economic development and ecotourism. Alternative B would also support recent efforts by Northampton County to preserve open space, said TNC.

**Response:** Again, we would like to thank these agencies and organizations for their support of our land acquisition program. It is through these types of partnerships that we can protect the natural resources of Northampton County while encouraging sustainable development.

**Comment:** The Society recommended we offer a more concrete proposal on the relative amount of forest, shrub and grassland that we would restore and maintain on lands proposed for acquisition. They also recommended strengthening our commitment to restore farmland to native habitat.

**Response:** Our main concern is to protect and restore Neotropical and temperate bird migration habitat, primarily forests and shrub lands, in order to widen and reconnect the vegetated migration corridor in the lower Delmarva Peninsula. We have also pledged to look for opportunities to restore several large grassland tracts to native warm-season grasses, from agricultural lands, based on recommendations from our biological expert's workshop.

In the Draft CCP/EA (Chapter 2) and in the LPP, we make a firm commitment that acquired agricultural lands will be restored to hardwood forest and shrub habitats. However, individual tracts have not been delineated as to how each would be restored to native habitat types (i.e., forest, shrub, grasslands). There are 172 identified tracts, and specific management decisions will be determined when, and if, these tracts are acquired. As such, the objectives in the LPP are stated in a more general way for the overall expansion area.

Part of our reasoning is that as development and other changes occur on the peninsula, it is possible that one habitat type will become more critical than another. Additionally, the location, surrounding habitats, soils, etc. should be taken into account when making those decisions. It is also worth noting that, given our willing-seller policy, it is hard to predict exactly where and in what configuration lands will be acquired and managed over time. If the surrounding habitat is mature hardwood and the soils lend themselves to hardwood forest, then this will likely be our management strategy. However, if the surrounding area is agriculture and the tract is small, we may decide to re-vegetate into a shrub/scrub habitat if the soils will support this.

Due to the large number of tracts, the timeline for acquisition is very long, and the potential for numerous changes and development within the acquisition boundary area is high. Therefore, we feel it would be best to make specific decisions (beyond restoring to native habitats) when the lands are acquired and these conditions can be assessed.

### **Hunting**

**Comment:** The Society identified concerns about the safety of the current and proposed hunting zones on the Eastern Shore of Virginia Refuge both for hunters and other refuge visitors, mentioning specifically the size of the hunt zones and their adjacency to roads and trails. They questioned if the hunt programs are being reviewed annually and what data the refuge has collected on accident rates. One individual commented that during the hunt season, hunters do not always stay in their assigned areas, and will sometimes wander into other areas. The Society also expressed concern about minimizing conflicts between hunting and other priority public uses.

**Response:** Prior to opening the Eastern Shore of Virginia NWR to hunting in 1992, we worked with the VDGIF to determine the safe number of hunters for each hunt zone. Zone size, shape and habitat were taken

into account when making these decisions. No hunt accidents have occurred on this refuge. As we stated in Chapter 2 of the Draft CCP/EA, we will work with State and Federal partners in the near term to determine if the number of hunters per zone are still appropriate and safe.

Each year, we will continue to complete an annual hunt plan and submit it for review and approval by both our regional biological and visitor services specialists. They review these documents for compliance with Service mandates and policy, and to make recommendations for improving the quality of the hunt program. A high quality hunt includes ensuring safety and minimizing user conflicts. Our programs are designed to also accommodate non-hunting visitors during the hunting seasons. We have several areas that remain open for wildlife observation and photography during the hunting season. For example, if visitors arrive on a gun hunt day, they can enjoy the Visitor Center, photo blind and surrounding wildlife areas. During the archery hunt, all walking trails are also open to the general public.

A full-time Refuge Law Enforcement Officer will be employed to provide increased vigilance during the Refuge hunts. The Officer will enforce fish and wildlife laws and refuge regulations, including hunter assigned area compliance.

**Comment:** We received comments about the refuge deer hunt conflicting with the migration of certain birds and causing “unreasonable damage” to migratory bird habitat by hunters walking through areas where these birds feed and rest. One individual questioned the implication that hunters walking through Fisherman Island NWR would cause less damage to the vegetation and the soil than birders. The individual further questioned why birders on Fisherman Island NWR are limited to a trail and deer hunters would not be.

**Response:** The existing deer hunt program on Eastern Shore of Virginia NWR occurs during the State regulated archery and gun hunting seasons. Archery season is approximately 12 days from late October to early November and gun season is approximately 7 days from mid-November to mid-December. The majority of migratory birds have moved through the refuges by mid-November. As such, it is the archery season that corresponds more closely with the time the high numbers of migrating birds are in the area. The current refuge deer hunt is designed to reduce degradation of migratory bird habitat caused by an overabundance of deer. Studies have shown that a high density of deer can have a significant adverse effect on forest understory and shrub vegetation; habitats of particular importance to Neotropical migrant birds. We have observed this habitat degradation from deer on the refuge; and reducing these impacts is a management priority.

Because we are concerned with the increased access and the resulting potential for ecological impacts to Fisherman Island Refuge, our Proposed Action is to implement a management deer hunt only if annual monitoring shows a significant decline in habitat quality due to over-browsing. We will evaluate the need for this hunt each year.

We recognize that foot traffic could impact sensitive soils and habitat on both refuges, regardless of whether the activity is hunting or bird watching. However, it is also true that hunters tend to disperse for safety and scouting reasons and we have not observed any environmental impacts in areas we currently have open to hunting. Moreover, on Fisherman Island NWR, it is likely that hunting would be required from stands, which would alleviate some habitat disturbance. Habitat monitoring and analysis of both refuges’ hunt areas will occur on an annual basis.

**Comment:** We received comments requesting the addition of a muzzleloader season to the deer hunt on Eastern Shore of Virginia NWR, adding a doe season with a special fee, and a request to raise the hunt fee to \$20 and allow crossbow use for disabled hunters.

**Response:** As we described in the Draft CCP/EA (Chapter 2; Alternative B: Proposed Action) we plan to work with our State partners to review our current hunt program. This review will include an evaluation of numbers and distribution of hunters and type and method of hunt. Our primary objective will be to reduce deer numbers, while offering a safe, high quality hunt at times which minimize impacts to migratory birds. During our review, we will consider a doe-only hunt and allowing muzzleloaders during the refuge firearms hunt if it meets our objectives. However, at this time, we do not foresee adding a special muzzleloader hunt coincident with the current state muzzleloading season. Our concern is that the State's early muzzleloading season typically falls when Neotropical migrant birds are abundant in the area (late August to mid-November).

With regards to disabled hunters, those who meet the criteria established by State regulations are allowed to use crossbows during the archery hunt. Finally, a fee increase is included in the Proposed Action to \$30 per hunter. This would help defray the administrative costs of the hunt.

**Comment:** An individual questioned the scientific basis for the current Eastern Shore of Virginia Refuge white-tailed deer hunt. Specifically, the individual wanted to know who ran the studies and how, when and where the studies were done. Finally, the individual wanted to know the exact number of the deer population on both refuges.

**Response:** An abomasal parasite count (APC) was conducted by the State prior to the establishment of the hunt on the Eastern Shore of Virginia NWR. This count is an accepted method in the southeastern United States for evaluating deer populations in relation to the available food supply. The APC count for the deer on the refuge was 23% above recommended levels. Additionally, spotlight censuses and habitat studies were conducted along with a review of the number of vehicle/deer collisions in lower Northampton County. All of these factors pointed to the need to reduce the number of deer on the refuge in order to improve deer health as well as the habitat quality for migratory birds. Hunting is a management tool that is used to achieve this objective. In addition, the deer hunt is a priority wildlife-dependent recreational use of the National Wildlife Refuge System as mandated by the NWRSIA.

We do not know the exact population of deer on either refuge. The nature of surveying white-tailed deer on an open property does not produce exact numbers. The surveys we conducted provided an index of the number seen, browse lines, deer condition and population trends. From these results, we can formulate management decisions to enhance habitat and provide wildlife-dependent recreational opportunities.

## **Fishing**

**Comments:** The Virginia Department of Conservation and Recreation encouraged the Service to open a portion of the southern tip beach at Eastern Shore of Virginia NWR to "limited surf fishing." One individual suggested providing access to the beach near the Chesapeake Bay Bridge-Tunnel (CBBT) property for surf or pier fishing.

**Response:** We considered opening both these areas, the southern tip beach and the beach near the CBBT, to surf fishing. However, neither area has existing, public overland access and creating access on refuge lands would degrade important habitat areas. Access by water is dangerous at the beach near the CBBT because it is located near the confluence of the Chesapeake Bay and Atlantic Ocean and has very strong currents. Directly in front of a section of this beach are commercial clam beds that would be destroyed if people were to land boats or walk over them. Additionally, opening an area adjacent to the bridge abutments would not be prudent as far as security of the bridge is concerned.



Consideration for surf fishing on the southern tip beach was abandoned because of the presence of the Federal-listed (threatened) Northeastern beach tiger beetle. Although the beetle can withstand some human pressure, we do not have information that would help us determine limits at this site. With our “wildlife first” mandate, we decided it was best to focus our fishing opportunities at the Wise Point boat ramp. In addition, discussions with personnel from Kiptopeke State Park (3 miles north) verified that surf fishing at the park is underutilized at this time.

**Comment:** Two individuals suggested opening Fisherman Island NWR to surf fishing, either on a permit or fee basis. It was suggested that anglers could arrive by boat and anchor just inside the tidal flat area. Another individual stated that Fisherman Island should not be open to surf fishing.

**Response:** We do not propose opening up Fisherman Island NWR to surf fishing due to our concern with impacting nesting and migrating birds and our concerns with visitor safety. Fisherman Island NWR is used by a large number and diversity of beach nesting birds from March through September. Some species, such as the brown pelican and royal tern, are colonial nesting birds and congregate in large numbers in specific areas. However, other species, such as the American oystercatcher, are individual nesters and are dispersed along the entire perimeter of the refuge. The U.S. Shorebird Conservation Plan lists the American oystercatcher as a species of high concern; the Regional plan, which includes Virginia, lists the oystercatcher as a species of highest regional conservation priority. Annual surveys along the Virginia barrier islands since 1979 have shown that the oystercatcher population has declined by over 60% in the last two decades (Wilke, 2004). These birds are inherently shy and sensitive to human disturbance (Wilke, 2004). Additionally, the Federal-listed (threatened) piping plover uses the refuge beaches during migration and has historically nested on the refuge. Also, with regards to visitor safety, the tidal flats at Fisherman Island are quite extensive and anchoring within the flats has stranded a number of boaters, some for several hours, over the years. We decided to not allow surf fishing along the refuge beach because of the likelihood of human disturbance to nesting and migratory birds of high conservation concern during critical times of the year, and because of safety reasons.

### **Boating and Fishing Access at Wise Point Boat Ramp**

**Comment:** Several individuals commented on the Service’s proposal for managing the Wise Point boat ramp. The comments included building a separate boat ramp for recreational anglers, continue to use the existing boat ramp, and work with Northampton County to build a new parking area and boat ramp on Raccoon Park (County-owned property) for recreational use. Additional comments included proposing a new ramp for recreational anglers to be built farther south on the former Wise Point property, and providing two boat ramps to eliminate delays for recreational anglers.

**Response:** The mission of the Service is to manage fish and wildlife resources and, where compatible, wildlife-dependent recreational activities. Therefore, the main purpose of this boat ramp is to facilitate wildlife-dependent recreational activities. However, we realize the importance of this access point to commercial watermen and the importance of the commercial fisheries to Northampton County. We are committed to assist this commercial use within certain guidelines. Building two boat ramps within a few hundred yards of each other does not make fiscal sense, especially when one considers that Raccoon Creek would need to be dredged in order to be useful as a launch site and that the major limiting factor in this area is adjacent uplands for parking. The area proximate to the CBBT span is not appropriate for reasons delineated in the response to surf fishing above. In Chapter 2, our Proposed Action is designed to alleviate delays due to commercial off-loading by construction of a commercial off-loading site.

**Comment:** A commercial waterman who utilizes the Wise Point boat ramp said he would like to retain his privilege to use the boat ramp and he would like to see some improvements to the ramp, the parking area and the docking area.

**Response:** This individual would retain his privileges to use the Wise Point boat ramp as delineated in the Proposed Action in Chapter 2. We propose to upgrade the ramp, parking, and dock areas as described in the Draft CCP/EA.

**Comment:** Another commercial waterman pointed out that one of the Service's obligations is to provide recreational opportunities for the public and, as of this time, the Service is not doing that. He also said the proposal in Alternative B for satellite parking for commercial watermen is not a viable option. After bringing their catch ashore, commercial watermen cannot take the extra time to retrieve their vehicle from satellite parking, especially during the hot summer months, because their catch could spoil.

**Response:** It is true that we have closed the boat ramp to recreational use at this time is. Our responsibility is to provide a safe and positive experience. When we purchased the property, it was apparent that there were numerous safety issues and we could not open the area to general use without first eliminating these concerns. We have been working hard to obtain funding, permits, engineering designs, and other necessary elements so that we can move forward with the improvements and re-open the area to recreational use. There will be a number of parking spaces adjacent to the boat ramp that will be available on a first-come, first-served basis. During the majority of the year those spaces will be open. We will recommend to commercial watermen that they carpool when possible to reduce the number of vehicles in the area. If it is necessary to park in the overflow parking area, one person can go for the vehicle while others are readying the catch for off-loading and preparing the vessel for overnight docking or trailer use.

**Comment:** Two individuals wrote in support of Alternative A's proposal for managing the Wise Point boat ramp. Under that Alternative, the Service would manage the boat ramp similarly to the way the Wise Point Corporation managed the boat ramp prior to selling it in 2001. Another individual suggested giving preferential treatment to at least some of the "previous keyholders," or the recreational anglers who had access to the boat ramp when it was owned by the Wise Point Corporation. This individual also recommended we randomly choose which of the previous keyholders would be afforded this preferential treatment by holding a lottery.

**Response:** In Alternative A, minimal improvements would be made to the road and boat ramp and the area would be open to just those 120 recreational anglers and 21 commercial watermen that held a permit with the previous landowner. Although this may be desirable to the 141 people that would gain preferential access, it is not a viable option for a Federal agency managing lands in the public trust. A private corporation does not have the responsibilities and expectations that a federal agency has in providing balanced and safe opportunities to the public. It is important to note that previous keyholders will not be denied access in the proposed alternative.

**Comment:** We received several comments concerning access to the Wise Point boat ramp. The comments included allowing both recreational anglers and commercial watermen unlimited access, 24-hours a day, seven days a week; allowing only commercial watermen such access; installing one-way treadles on the boat ramp entrance road so users could exit any time of the day or night, and using an honor system for fishing and launching after hours.

**Response:** We are presently proposing to open the ramp during daylight hours with extended hours during certain fishing seasons. We will review the demand and identify problems after the ramp has been open for one year and periodically thereafter. Although there will be specific hours of operation, we are planning to install a

one-way exit system, as described on page 4-18 of the Draft CCP/EA, for boaters that have problems and cannot return prior to the hour of closure. We have spoken with Northampton County board members concerning the need to install a gate but have not yet submitted a proposal to the Board of Supervisors for approval. Northampton County owns property that this gate would affect. There will likely be a ramp use honor system during certain hours and seasons.

**Comment:** One individual who called himself “an advocate for commercial and recreational water access from the Refuge” wrote that he has heard plans for ramps and dockage is “still swirling in controversy” and that new options may be proposed, “but I believe we need to move forward – not backward.” He urged approval of the final CCP and “then rapid movement to fulfill the Service’s commitment to provide meaningful commercial and recreational water access from the Refuge.”

**Response:** We appreciate this individual’s concern. The public comment period is an important element of the process to ensure that the needs and desires of the community are heard and responded to. Good suggestions are often introduced during this process that need to be considered. Once a final CCP is approved, we will move forward with the boat ramp development decision as a very high priority.

**Comment:** One individual, who asked that the boat ramp be reopened to recreational anglers as soon as possible, commented that the only way to canoe, hunt, take pictures or engage in any recreation is through the boat ramp.

**Response:** Northampton County currently provides access for canoes, kayaks, and other small boats at Raccoon Creek. Additionally, there is boat access at the towns of Oyster and Cape Charles, and at Kiptopeke State Park. As stated above, we are moving as quickly as possible to open the Wise Point boat ramp.

**Comment:** Several commentators noted that the Wise Point boat ramp provides a safe harbor for recreational anglers and commercial watermen in the event of bad weather. The boat ramps at the Town of Oyster and Kiptopeke State Park do not always provide safe access for commercial or recreational users.

**Response:** Any boater in distress will be able to use the Wise Point boat ramp as a safe harbor.

**Comment:** Two comments requested we think about how to provide boat ramp access for emergency vehicles.

**Response:** We are also concerned that emergency vehicles and personnel have access to the boat ramp. Presently there are 15 complimentary keys issued to a variety of agencies including the Coast Guard, Northampton County, and various law enforcement organizations. When the boat ramp is completed, a sign with emergency contact numbers will be installed and emergency contact numbers will be re-issued to various agencies.

**Comment:** The Society supports our proposal to prohibit personal watercrafts from launching from the Wise Pont boat ramp and suggested we expand this proposal by prohibiting the operation and landing of personal watercrafts on the refuges.

**Response:** We do not allow landing of watercraft of any kind on refuge property. As far as operating personal watercraft on refuge waterways, the Department of Interior has been addressing this concern in certain parks and refuges and at some point this refuge may become a part of those regulations. However, most of these waters fall under State jurisdiction and we do not have the authority to deny this use in those areas.

**Comment:** We received several comments from the Society concerning the Wise Point Boat Ramp expansion. The Society “does not support the development at Wise Point because such development will harm the wildlife and habitat the refuge is intended to protect. The plan details a litany of adverse effects the proposed expansion would have on the ecology of the refuge and, therefore, is inappropriate development in sensitive habitat.”

The Society stated that we did not address the adverse effects of the boat ramp improvements including the expanded parking lot, concession stand, turnouts, and restrooms, and voiced “concerns about contaminants that may be exposed by the dredging and pier/mooring post removal as well as the increased traffic that may result in more litter, vandalism and wildlife disturbance.”

The Society asked about the monitoring and analysis of the effects of the boat ramp expansion, data collection that supports the level of use that will result in habitat degradation or wildlife disturbance, and about the plans to prevent damage to the sensitive barrier islands and refuge plant and animal resources. They questioned the size of the boats launched in relation to the size of the boat ramp, and inquired about the finances involved in the Wise Point boat ramp expansion. Finally, they urged the Service to work with local officials and interests to find a more suitable site for a boat ramp, including looking at whether other boat ramps in the vicinity could be expanded without harm to the environment.

**Response:** We have identified and described the reasonably anticipated impacts that this use will have on refuge purposes and the National Wildlife Refuge System mission, in both the Draft CCP/EA and the Wise Point boat ramp compatibility determination (CD). As a result, we are designing the boat ramp to minimize these negative effects. For instance, the present parking area is located on an ecologically compromised former dredge fill site. The proposed expanded parking area would not destroy any trees or shrubs. The present portable bathrooms would be replaced with an environmentally friendly facility (potentially composting toilets). The proposed small fee station would be built on a former dredge spoil area. We propose that the fee station be run by a concessionaire, who will help us manage the site under a special use permit and according to refuge regulations. In the draft project design, there is a possibility that the satellite parking lot would not be necessary. However, some fill would be used to create pull-offs or widen the road to ensure safety along the entrance road. Through coordination with regulatory agencies, we would be mitigating the minimal wetland losses. Any adverse effects or impacts that would be caused by the construction are one-time disturbances and are tightly regulated by several agencies, including the County Wetlands Board, State Department of Environmental Quality and US Army Corps of Engineers.

Preliminary contaminant studies have been completed and few contaminants were detected in the surface sediments adjacent to the boat ramp and docks. However, it is doubtful any contaminants are at depth since it is anoxic and the temperature is cooler. Silt catchments and silt curtains would be used during any sediment disturbance. The contaminants of concern in this area generally adhere to sediments and should be contained before being mobilized.

The Wise Point boat ramp has been conditionally closed since we acquired the property two years ago. During that time, we have patrolled the area to protect the refuge from trespass, fire and unauthorized use. In 2003, two large signs informing boaters that Fisherman Island NWR is closed to boat landings were installed. Following the proposed boat ramp expansion, we would restrict boat ramp parking to 75 vehicles, prohibit pets on boats, prohibit the launching of personal watercraft from the refuge, extend the no wake zone in the Virginia Inside Passage, install closed area signs on the barrier islands, require commercial tour guides to take a training course on minimizing human disturbance to wildlife resources, phase out boat docking and install educational signs in the boat ramp area. When the boat ramp is re-opened to recreational use, a full-time Refuge Law Enforcement Officer will provide increased vigilance to these sensitive areas. The Officer will enforce fish and

wildlife conservation laws, refuge regulations; and maintain liaison with special agents, state conservation officers, state police and local enforcement agencies. This increase in law enforcement vigilance in the boat ramp area, barrier islands and marshes will dramatically reduce the severity of the adverse impacts identified in the Draft CCP/EA and CD.

Routine law enforcement patrols will be conducted throughout the year, and as a result, no significant habitat degradation or wildlife disturbance is expected to occur as a result of this use. The patrols will promote compliance with refuge regulations, monitor public use patterns, public safety and document visitor interaction. Patrols will include recording visitor numbers, vehicle numbers, visitor activities and monitoring the locations where the activity takes place to document current and future levels of Refuge use. Patrols will also include the routine assessment of safety conditions and visitor interactions on Refuge property and the barrier islands. Conditions that are or will risk public safety, cause habitat degradation or wildlife disturbance will be identified, monitored and the appropriate action will be promptly taken to correct such conditions.

Our objective in the design of the new ramp is to accommodate a relatively shallow draught fishing boat rather than the deeper draught pleasure boat. Our goal is to facilitate wildlife-dependent recreational activities, such as wildlife observation and fishing.

We worked with local officials and interests to find a more suitable site for a boat ramp, including looking at whether other boat ramps in the vicinity could be expanded. We were unable to find a suitable and available site in the vicinity that would provide the necessary elements for the county, recreational anglers and commercial watermen. The Wise Point boat ramp is a special site because of its deep water, location within the Virginia Inside Passage, proximity to the Bay Bridge-Tunnel complex, extensive aquaculture sites, and marshes and islands which provide a safe harbor for boaters.

The funding needed for this project falls into two categories: one-time construction and annual funding for managing and maintaining the use. We will pursue \$540,000 to improve the entrance road and parking area from the Federal Highway Administration (FHA). An additional \$580,000 would be allocated for construction of the boat ramp, dock and bulkhead, from the Service's maintenance budget. The annual Refuge budget associated with the administration of this non-consumptive use is primarily related to effective law enforcement, answering general questions from the public and partners, monitoring use patterns, monitoring impacts, and documenting habitat degradation or wildlife disturbance. The Fiscal Year 2004 budget allocation for the Refuge is \$559,391 for operations and \$26,800 for maintenance. This current allocation, coupled with our recommendation of increased staffing, is adequate to ensure that the Wise Point boat ramp is compatible with the Refuge purposes and the National Wildlife Refuge System mission. Assuming these budget and staff levels are sustained, it will allow us to provide a high standard of public and resource protection, while eliminating or mitigating potential conflicts.

**Comment:** The Northampton County Board of Supervisors commented that it has received concerns from its citizens regarding access to the boat ramp. The Board suggested discussing with the Service the possibility of exchanging Raccoon Park (a County-owned in-holding) for the boat ramp. The Board wrote; "it is crucial to keep the ramp open for the vitality of the commercial fishing and aquaculture industries. More than fifty citizens are employed by use of the ramp."

**Response:** We met with Northampton County Administrator, Lance Metzler, and Board Members Thom Dixon and Jack White on December 10, 2003 to discuss their comments and concerns. We assured them that our proposed action would maintain access to the boat ramp for both recreational anglers and commercial watermen as we describe in our other responses. Subsequent to the December 10th meeting, we researched

possibilities for a land exchange, lease arrangement, or dual ownership of the boat ramp. As we conveyed to them in a March 9, 2004 letter, we do not consider these as valid options based on our review of property records, applicable laws, Department of Interior regulations and Service policy on compatible uses.

### **Wildlife Observation and Photography, Environmental Education, Wildlife Interpretation**

**Comment:** Virginia Department of Conservation and Recreation encouraged the Service “to include pedestrian nature trails to the extent that the mission of the refuge will allow.” The Coastal Virginia Wildlife Observatory stated that it would support the “continuation and expansion of on-site public education.”

**Response:** Our Proposed Action would expand pedestrian nature trails. We would develop a trail towards the tip of the peninsula and would add new trails as more lands are acquired. We would also expand our environmental education program to include a Spanish language environmental education program, curriculum-based lesson plans, adopt a local classroom, add teacher workshops, add an Elder Hostel program and develop an environmental education study area.

**Comment:** The Waste Division of the Virginia Department of Environmental Quality (DEQ) commented that both refuges are Formerly Used Defense Sites (FUDS) that were once used for barracks, an airfield, troop training exercises, firing of artillery guns, or solid waste disposal. Those former activities pose potential hazards to human health. Given the proposals to expand wildlife-dependent public uses on the refuges, DEQ’s Waste Division recommended that the Service work closely with the Norfolk District U.S. Army Corps of Engineers. The Division also recommended that the Service consider a public awareness program for visitors.

**Response:** In the Draft CCP/EA (Chapter 3), we describe the Contaminant Assessment Process (CAP) conducted on both refuges. This process gathers information regarding environmental contamination and human health and safety risks on refuges. It also provides recommendations on methods to definitively assess risk and/or remediate threats. We have also held meetings with both DEQ and the Corps of Engineers regarding the FUDS sites. We agree to include in our Proposed Action additional language which specifically mentions coordination with both agencies to ensure all necessary clean-up and safety work is completed before we open any new refuge areas to unrestricted public access. We will also specifically identify that the Mine Commander’s Bunker will be sealed to prevent entrance and Battery 227 will be locked to prevent access if Fisherman Island Refuge is open to unsupervised access. With our plan to eliminate these threats to public safety, we believe a “public awareness program” would cause undue alarm, and therefore, we do not feel such a program is necessary.

**Comment:** One individual suggested restoring the World War II bunkers on the refuge and including them in an interpretive program focused on local wartime history.

**Response:** We presently have some interpretation of the bunkers and the importance of the area during World War I and World War II. The nature trail goes through a section of bunker and has steps to the top of the bunker.



## **Firearms Range**

**Comment:** The Society supports the proposal to relocate the firearms range.

**Response:** We appreciate the support for this proposal. It is important to recognize, however, that the firearms range is located on Northampton County property, adjacent to the Eastern Shore of Virginia NWR. It is necessary that the County be a key partner in implementing this recommendation and facilitating the relocation.

**Comment:** An individual questioned whether noise from the firearms range disturbs migratory birds and visitors any more or less than noise from shotguns during the hunt season. The individual also questioned the implication that it is less disturbing for hunters to walk through the understory, where migratory birds find feed and rest, than it is for people to gather and use the firearms range.

**Response:** Depending on the number of law enforcement officers that are qualifying on a given day, there could be 1,000 rounds fired. Firearms qualification occurs throughout the year, whereas the firearms hunt is held on seven days in late November and December, when the numbers of Neotropical migratory birds are declining. During any given hunt day there are probably no more than 30 shots fired. This would equate to approximately 210 shots spread over a five week period. We realize that hunters will produce some disturbance while in the field, but hunters generally walk to a hunt stand and remain there quietly until a deer passes in the vicinity of their stand. The benefits of reducing the deer herd, and maintaining high quality understory habitat for migratory birds outweighs this minimal disturbance.

## **Artificial Structures**

**Comment:** One individual suggested keeping the communications tower on the Eastern Shore of Virginia Refuge as a means for generating income for the Refuge.

**Response:** The tower was erected on the Cape Charles Air Force Base by the C&P Telephone Company with a 50-year lease between the U.S. Air Force and C&P. The lease is set to expire on July 15, 2007. This lease was honored by the Service through a cooperative agreement when the property was transferred in 1984.

There are numerous studies documenting high bird mortality from collisions with communications towers. The Service developed national guidelines on communication towers in August 2000 stating that towers should not be sited in or near wetlands, sensitive habitats, or other known bird concentration areas, including national wildlife refuges. This refuge lies within a hemispherically important fall migratory bird route, where millions of birds pass through. The risk to migratory birds of maintaining this tower is too high. While we intend to honor the lease until 2007, as we stated in the Draft CCP/EA (Chapter 2), our Proposed Action is to discontinue the lease and have the tower removed after that date.

## **Contaminants**

**Comment:** The Virginia Department of Environmental Quality's Waste Division recommended that the Service determine whether hazardous waste is or would be generated by the proposed boat ramp construction or by current utilization of the firearms range. The Division also requested more information about the proposed construction project in the Draft CCP/EA to determine whether the refuge will need to obtain appropriate permits.

**Response:** Sediment samples were taken from the boat ramp and areas north and south of the ramp (near boat dockage) during summer 2003. The sediments were analyzed for total metals, total organic carbon, grain size, organochlorine, PCB's, and aromatics. A final report of these results is not currently available; however, the preliminary report shows that no results were above the Effects Range Low (ERL) values.

The firearms range is not located on refuge property. However we do manage its use and maintain the site for Northampton County. Inherently firearm use does produce hazardous byproducts, including, but not limited to, lead, arsenic and antimony. In 1997 the Corps of Engineers performed some contaminants testing on this formerly used military site. They collected soils from the backdrop at the range and found elevated levels of the three metals mentioned above. The refuge requested permission in 2000 and 2001 to do additional contaminants testing behind and adjacent to the firearms range to test if these contaminants were migrating from the primary range site. We did not receive permission from the County to complete this testing. However, in 2003 we did complete contaminants testing in the State-owned marsh behind the firearms range. A final report of the findings is not presently available. We are concerned about the potential for elevated contaminant levels and have reached an agreement with the County to restrict use at this range to law enforcement agencies from the Eastern Shore of Virginia only, until another range is constructed offsite.

The Service is legally committed to obtain the appropriate permit approvals prior to initiation of any construction project.

### **Field Research Support**

**Comment:** The Coastal Virginia Wildlife Observatory (CVWO) commented that it would “endorse continuation and expansion” of field research projects on the refuge aimed at providing scientific data about birds, butterflies and other local wildlife.

**Response:** Research has increased our knowledge of the critical role the Eastern Shore of Virginia NWR plays in avian migration and we support management-related research as our highest priority. Other research is permitted as resources and time allow. However, all research must meet certain minimum standards and be completed such that results can be peer-reviewed.

### **Suggestions for Other Alternatives**

**Comment:** One individual wanted to see more options other than the four alternatives presented, and suggested “mixing and matching” the four alternatives to come up with something different. Two comments proposed that the Service meet with a group of people representing recreational, commercial, State and county interests to review the plan and make additional suggestions.

**Response:** It is important to remember that respective alternatives as presented in the Draft CCP/EA constitute “thematic” groups of management actions, and in many cases switching individual actions or strategies would not be consistent with the themes. While we may move selected actions for sound reasons, we prefer to maintain the thematic groupings for evaluation purposes. We have met with a variety of people and agencies while producing the Draft CCP/EA. We held several public hearings to gather input from anyone who has an interest in the future management of these refuges. Additionally, the public comment period has given people another opportunity to provide input. Our Regional Director, will make the final decision taking into consideration all the comments we received on the Draft CCP/EA.

## **Cultural Resources**

**Comment:** The Virginia Department of Historic Resources stated that both refuges contain several identified cultural resources and encouraged the Service to take these resources into consideration throughout the planning process. The Service was also encouraged to continue consulting with the Department on cultural resource issues as necessary, and as required by law (Section 106 and 110 of the National Historic Preservation Act).

**Response:** We are committed to fulfilling our legal mandates related to cultural resources and to coordinate with the Department of Historic Resources. No action will be taken that compromises the integrity of nationally historic cultural resources.

## **Other Uses**

**Comment:** One individual requested using the Refuge for a casting contest organized by Sportcast USA.

**Response:** Although this is an interesting idea, the refuge does not have many large open areas in which to accommodate such a contest. Kiptopeke State Park does have many large open areas. We would propose this activity occur off the Refuge, possibly at the state park.

**Comment:** The Society suggested the plan state more explicitly that a public use is only permitted on the refuge if the Service has determined it is compatible.

**Response:** The Draft CCP/EA specifically states that the NWRSA requires that “all existing or proposed refuge uses must be compatible with the purposes of the refuge and the mission of the system....”. Once approved, only those refuge uses we have determined compatible through the compatibility determination process may be allowed. The compatible uses we proposed in the Draft CCP/EA were presented in Appendix F. In this final CCP they are included as Appendix D.

## **General Support for Alternative B, the Proposed Action** (No response warranted)

**Comment:** The VDGIF supports Alternative B, Proposed Action, to increase monitoring of federal-listed species and other species and habitats of special concern and to eradicate invasive species.

Citizens for a Better Eastern Shore (CBES) wrote in support of the Proposed Action (Alternative B), as it will “positively impact the future of our community.” These positive impacts include protecting wildlife and their habitats, and boosting the local economy by offering ecotourism and by improving facilities for recreational anglers and commercial watermen.

CVWO commented that “Alternative B seems to provide an excellent approach to achieving the goals of conservation of wildlife and their habitats.”

The Northampton County Board of Supervisors commented that Alternative B is “the most beneficial to the citizens of the County of Northampton, while accomplishing the goals and objective of the U.S. Fish and Wildlife Service.”

## Appendix C

# Finding of No Significant Impact

## **Finding of No Significant Impact**

### **Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges**

### **Comprehensive Conservation Plan**

The Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) of March 2003 for Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges (NWRs) evaluated four management alternatives, carefully considering their impacts on the environment, and their potential contribution to the mission of the National Wildlife Refuge System, and each refuge's purposes and goals. A brief summary of the four alternatives follows.

**Alternative A:** This was the No Action Alternative in the Draft CCP/EA required by the Council of Environmental Quality's regulations on implementing the National Environmental Policy Act. Under this alternative, there would be no change from our current resource management programs on refuge lands. We would continue to manage for the existing diversity of habitat types—hardwood forests, shrub and grasslands—for a variety of bird species. Public use programs would be maintained at existing levels and the Wise Point boat ramp on the Eastern Shore of Virginia NWR would be managed much like it was under the former owner, the Wise Point Corporation. We would maintain our current, approved Eastern Shore of Virginia NWR land acquisition boundary and continue to pursue, from willing sellers, the 310 acres that are not yet acquired. We would not renew the Verizon Virginia, Inc. communications tower lease after it expires in 2007, and would require them to remove the structure.

**Alternative B:** This alternative was the Service's Proposed Action in the Draft CCP/EA. Under this alternative, we would focus our management on protecting, restoring, and enhancing habitat for forest- and shrub-dependent Neotropical and temperate migratory birds of conservation concern. To further protect essential habitat for these species, we would expand the approved land acquisition boundary on the Eastern Shore of Virginia NWR to include an additional 6,030 acres on the lower Delmarva Peninsula. We would also increase monitoring and surveying for Federal-listed species, such as the threatened piping plover and northeastern beach tiger beetle, as well as beach-dependent nesting birds. The quality of our priority public use and outreach programs would be enhanced, with new infrastructure and new opportunities for hunting and wildlife observation. We would also upgrade facilities at the Wise Point boat ramp, providing safe and improved access for recreational anglers and commercial watermen. As in Alternative A, we would require Verizon Virginia, Inc. to remove the communications tower in 2007 with lease expiration. We will also evaluate the need for, and alternative locations for, continued use of the switching station adjacent to the tower.

**Alternative C:** Under this alternative, we would focus our management efforts on protecting, restoring, and enhancing habitat for grassland- and open habitat-dependent Neotropical and temperate migrant birds. As in Alternative B, we would increase monitoring and surveying for Federal-listed species and expand Eastern Shore of Virginia NWRs approved land acquisition boundary to include an additional 6,030 acres. We would increase hunting opportunities, but not as much as proposed in Alternative B. We would also open Eastern Shore of Virginia NWR's southern tip beach to surf-fishing. We would manage the Wise Point boat ramp as proposed in Alternative B, but design a smaller parking lot and reserve fewer parking spaces for commercial watermen.

**Alternative D:** Under this alternative we would focus our management on maintaining and restoring the natural dynamics of the ecosystems of the lower Delmarva Peninsula. We would primarily allow natural succession to occur. We would pursue the 6,030 acre expansion of the Eastern Shore of Virginia NWR boundary similar to Alternatives B and C. Our outreach and education programs would focus on the

importance of historic ecological communities to migratory birds. We would not expand hunting or fishing opportunities. The Wise Point boat ramp would be improved, but the capacity for parking and boat docking and mooring would be reduced. We would also remove several artificial structures on the refuges similar to Alternative B.

The draft CCP/EA was distributed for a 45-day public review and comment period from September 26<sup>th</sup> to November 10<sup>th</sup>, 2003. After consideration of all public comments, I have determined that this Environmental Assessment is sufficient to support my findings.

After careful review of the proposed management actions, and based on the analysis provided in the EA and the comments received during the review period, I have selected Alternative B (the Service's Proposed Action in the Draft CCP/EA) for implementation, with the following four modifications:

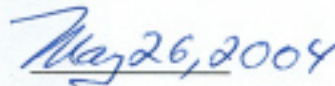
- 1) We will complete a wilderness review on both the Eastern Shore of Virginia and Fisherman Island NWRs within three years of final CCP approval;
- 2) We will also evaluate Skidmore and Fisherman Islands for their Research Natural Area potential within three years of final CCP approval;
- 3) We will coordinate with other authorities to ensure Formerly Used Defense Sites (FUDS) are secure and do not pose a safety hazard before we allow unrestricted access in their vicinity; and
- 4) We will modify our habitat prescription in Management Unit 8 on Eastern Shore of Virginia NWR to promote a shrub habitat type.

I have selected Alternative B, with the modifications noted above, because it helps fulfill the mission of the National Wildlife Refuge System; best achieves each refuge's purposes, vision, and goals; maintains and, where appropriate, restores the ecological integrity of both refuges; addresses the significant issues identified during the planning process; and is consistent with principles of sound fish and wildlife management.

I find that the implementation of modified Alternative B will not have a significant impact on the quality of the human environment in accordance with Section 102 (2) (c) of the National Environmental Policy Act. It adheres to all legal mandates and Service policies. As such, I have concluded that an Environmental Impact Statement is not required, and this Finding of No Significant Impact is appropriate and warranted.



Marvin E. Moriarty  
Regional Director  
U.S. Fish and Wildlife Service  
Hadley, Massachusetts



Date



## **Appendix D**

### **Compatibility Determinations**

## Compatibility Determination

**Use: Wildlife Observation, Wildlife Photography, Interpretation and Environmental Education**

**Refuge Name: Eastern Shore of Virginia National Wildlife Refuge**

**Establishing and Acquisition Authority(ies):** Eastern Shore of Virginia National Wildlife Refuge (Eastern Shore of Virginia Refuge) was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. Additional parcels of land were acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge Purpose(s):** ..... particular value in carrying out the national migratory bird management program. 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

..... suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..... 16 U.S.C. 460k-1 (Refuge Recreation Act)

..... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..... 16 U.S.C. 742f(a)(4)..... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..... 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** 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.

### **Description of Use(s):**

#### **A. What is the use? Is the use a priority use?**

The uses are wildlife observation, wildlife photography, environmental education and interpretation. These uses are priority public uses, as identified in the National Wildlife Refuge Improvement Act (USFWS 1997).

#### **B. Where would the use be conducted?**

All uses are conducted on Eastern Shore of Virginia Refuge. A 1.5-mile trail system from the Visitor Center to the Winslow Bunker offers year-round opportunities for observing Neotropical migratory species such as birds and butterflies. Two overlooks along the trail — one on top of the Winslow Bunker and another at the edge of a salt marsh — provide opportunities for viewing migrating birds overhead and wading birds such as herons and egrets at the marsh's edge. An observation window in the Visitor Center and a photo blind overlook a freshwater pond with a variety of bird species.

#### **C. When would the use be conducted?**

All uses will be conducted within regular refuge hours, which are a half-hour before sunrise to a half-hour after sunset.

#### **D. How would the use be conducted?**

A photo blind opposite the refuge headquarters offers opportunities for wildlife photography, as does the 1.5-mile trail system and its two overlooks. The staff conducts educational programs and guided interpretive walks for over 6,000 people each year and an additional 45,000 people participate in self-guided activities and non-staff conducted educational programs. On Eastern Shore of Virginia Refuge, these activities occur along trails and in the Visitor Center. Refuge staff visit local schools and hold several events on the refuge, such as birding festivals. Interpretive signs along the refuge's trail system offer opportunities for environmental interpretation.

We will continue with the above uses and add the following to improve the educational and interpretive programs for the public:

- Design and construct an environmental study area to include a half-mile trail, three teaching stations and a pavilion. Remodel a building to include a wet lab, indoor classrooms, hands-on exhibits and a teacher resource library.
- Develop new Visitor Center exhibits including a diorama and video focusing on Neotropical migrants.
- Upgrade Visitor Center exhibits.
- Enhance environmental education programs, including "adopt-a-classroom" program and teacher workshops.
- Develop a three-mile bike trail along an old railroad right-of way that runs parallel to U.S. Route 13. The trail will include two interpretive exhibit panels on migratory birds and their habitat.
- Open 0.6 miles of the Wise Point Road to foot traffic and construct a 200-foot boardwalk that leads to a marsh overlook. The boardwalk will end in an observation platform measuring 16 feet x 19 feet, with an interpretive panel.
- Hire a recreation assistant to help develop new interpretive displays, outreach exhibits, educational lesson plans, annual teacher's workshops, photography workshops and monthly educational programs (Proposed RONS project).

#### **E. Why is the use being proposed?**

Wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses as defined by the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), and if compatible, are to receive enhanced consideration over other general public uses.

**Availability of Resources:** Most of the projects below are already included in the Service's Maintenance Management System (MMS) or Refuge Operations Needs System (RONS) database for funding. Some projects, under the CCP, have been proposed for inclusion in one of these two databases. For a complete list of current and proposed MMS and RONS databases, see Appendix F.

Design and construct an environmental study area to include a half-mile trail, three teaching stations and a pavilion. Remodel a building to include a wet lab, indoor classrooms, hands-on exhibits and a teacher resource library. (MMS Project #00003)

**Cost Estimate.....\$42,000**

Develop new Visitor Center exhibits including a diorama and video segment; (RONS project #93111)

Equipment costs.....	\$32,000
Services/Supplies.....	\$30,000
Miscellaneous.....	\$ 3,000

**Total Cost.....\$65,000**

Replace Visitor Center exhibits (MMS project #98507)

**Cost Estimate.....\$125,000**

Enhance environmental education programs. (RONS project #93107)

Equipment costs.....\$34,000

Facilities costs.....\$48,000

Services/Supplies.....\$4,000 first year, \$4,000 recurring

Miscellaneous.....\$10,000 first year, \$2,000 recurring

**Total Cost.....\$102,000**

Develop a three-mile bike trail along an old railroad right-of way that runs parallel to U.S. Route 13. The trail will include two interpretive exhibit panels on migratory birds and their habitat.

(RONS project #00009)

**First-year cost.....\$44,000**

**Recurring costs.....\$ 6,000** (Project duration 2 years)

Open .6 miles of the Wise Point Road to foot traffic and construct a 200-foot boardwalk that leads to a marsh overlook. The boardwalk will end in an observation platform measuring 16 feet x 19 feet, with an interpretive panel. (Proposed RONS project)

First-year cost.....\$22,000

**Recurring costs.....\$ 3,000** (Project duration 2 years)

Hire a recreation assistant to help develop new interpretive displays, outreach exhibits, educational lesson plans, annual teacher's workshops, photography workshops and monthly educational programs. (Proposed RONS project)

FTE's..... 1 (GS-5)

**First-year cost.....\$40,000** for FTE, \$10,000 for materials

**Recurring costs.....\$34,000** (Project duration 15 years)

**Anticipated Impacts of the Use:** We predict impacts from the renovation of a building for environmental education will be minimal because we are not constructing a new building. The only new construction will be a trail and pavilion located along the trail. Construction will cause minimal disturbance because it is already a disturbed area. The site of the planned trail is also in a disturbed area, except for a portion of the trail that will run through a small amount of forest habitat (50-100 feet). Adding a trail will require mowing a strip of land and possibly laying down gravel in some areas. This will impact vegetation, causing some soil compaction which ultimately reduces vegetation composition and structure. Construction of a boardwalk will create disturbance to a portion of the pond by installing posts. The pond measures about one acre and is shallow. In dry years, there is no standing water. The pond receives occasional water bird use. More birds use the pond to the north, which will not be disturbed by the new trail.

Opening a portion of the Wise Point Road may cause disturbance to Neotropical avian species. Some research suggests human intrusion in wildlife habitats, such as walking on trails, can cause disturbance to wildlife. One example is a study (Gutzwiller et al., 1997) that showed human intrusion influences avian singing behavior in some species. During breeding season, the seasonal timing of male song affects the timing of territory establishments, male attraction, pair formation, egg laying, and transmission of information about breeding songs to young (Gutzwiller, et al., 1997). Therefore, if human intrusion

affects singing, it could ultimately affect reproduction and survival of some species. Another study (Riffell et al., 1996) suggests that when repeated human intrusion recurs over an extended period of time, impacts on avian reproductive fitness have the potential to accumulate temporally at the individual, population and community levels. However, the refuge's main role in the life cycle of avian species is not during breeding, but during migration, where less literature is available about the impacts from human intrusion.

Constructing the Wise Point Road trail will have minimal impact since there is already a paved road there. The Wise Point Road is in an already disturbed area, at 50-100 yards from Route 13, a major four-lane highway. We will, however, disturb vegetation to create a 200-foot boardwalk with a platform overlook onto the salt marsh. This may impact a small amount of salt marsh. Providing trails for public use could also result in litter, vandalism, removing plants and/or animals, and trespassing into closed areas.

The three-mile bike trail will run along an old railroad right-of-way which is in FWS ownership. The bike trail will measure about 8 feet-wide; the right-of-way is a total of 66-feet wide. The trail will run north from the refuge, parallel to U.S. Route 13, a major highway, with about 100-150 feet buffering the trail from the road. The east side of the trail will border agricultural land. Given the proximity of the trail to a major highway and to agricultural fields, the wildlife values are reduced. The configuration of the land as a long, thin corridor also makes it less valuable as habitat. Therefore, disturbance to wildlife will be minimal.

**Public Review and Comments:** As part of the Comprehensive Conservation Plan (CCP) process for Eastern Shore of Virginia Refuge, this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft Comprehensive Conservation Plan/Environmental Assessment (Draft CCP/EA).

**Determination (check below):**

☐ **Use is Not Compatible**

☒ **Use is Compatible With Following Stipulations**

**Stipulations necessary to ensure compatibility:** Public use areas will be monitored at various times of the year to assess wildlife disturbance. We will include information about proper etiquette and the effects of human impacts on habitat and wildlife resources in refuge publications and flyers, on kiosks and in interpretive programs. Periodic law enforcement will ensure compliance with regulations and area closures, and will discourage vandalism.

To limit wildlife disturbance, the new environmental education trail will only be used for scheduled outdoor educational activities. This will be about twice a day during the spring, once a week during the summer and less in the fall and winter. The area will be monitored throughout the year and, if necessary, trail use will be restricted during certain times to minimize disturbance to wildlife. The boardwalk to the pond will be built over wetland vegetation so as to minimize disturbance to vegetation.

We will limit access to the Wise Point Trail by offering only guided tours during the fall migration of Neotropical and temperate migrants. This will help minimize disturbance to birds who are feeding and resting during their south migration. All other times of the year, the trail will be open to visitors during normal refuge hours. If salt marsh is impacted to build the boardwalk and overlook on the Wise Point Road trail, we will restore an equal

amount of salt marsh elsewhere on the refuge.

**Justification:** One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for the public to develop an understanding and appreciation for wildlife wherever those opportunities are compatible. Environmental education, interpretation, wildlife observation and photography are identified in the National Wildlife Refuge System Improvement Act of 1997 as priority public uses. These activities will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge.

Signature:

Refuge Manager:

Susan M. Rice  
(Signature and Date)

Concurrence:

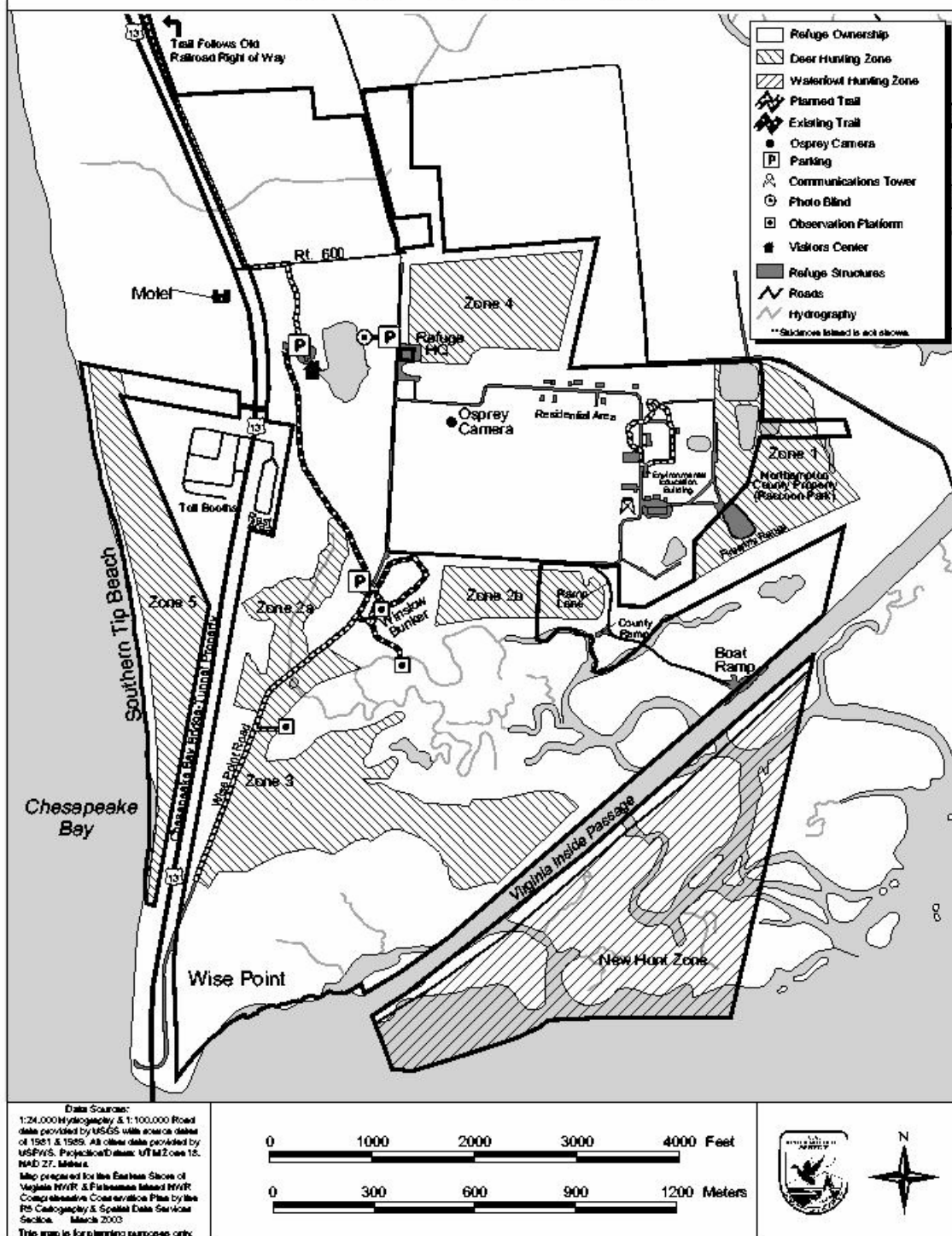
Regional Chief:

Anthony D. Lege  
(Signature and Date)

Mandatory 15-year Re-evaluation Date:

5/26/2019

# Public Use Opportunities Eastern Shore of Virginia Refuge





## Compatibility Determination

**Use: Commercial and Recreational Boat Access and Commercial Boat Docking at the Wise Point Boat Ramp.**

**Refuge Name:** Eastern Shore of Virginia National Wildlife Refuge

**Establishing Authority:** Eastern Shore of Virginia National Wildlife Refuge (Eastern Shore of Virginia Refuge) was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. Additional parcels of land were acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge purpose(s):** ..... particular value in carrying out the national migratory bird management program. 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

....suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..... 16 U.S.C. 460k-1 (Refuge Recreation Act)

..... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..... 16 U.S.C. 742f(a)(4)..... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude.....16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** 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.

### **Description of use(s):**

#### **(a) What is the use? Is the use a priority public use?**

Recreational and commercial boat access and historically permitted commercial boat docking (must meet certain criteria) at the Wise Point boat ramp. Recreational and commercial fishermen and recreational boaters have requested use of the Wise Point boat ramp to gain access to fishing and hunting grounds on both the Atlantic Ocean and Chesapeake Bay. Commercial watermen that historically docked at Wise Point are requesting continued overnight docking privileges. Recreational and commercial boat access and commercial boat docking are not identified in the National Wildlife Refuge System Improvement Act of 1997 (USFWS 1997) as priority public uses.

#### **(b) Where would the use be conducted?**

The Wise Point boat ramp is located at the terminus of Ramp Lane (see Map D-1) and adjacent to the deep waters of the Virginia Inside Passage. The facilities and access to this site include approximately 15 acres of tidally influenced salt marsh, maritime forest, shrub thickets and a dredge spoil site. Other areas that will be affected incidental to use include the barrier islands and extensive tidal marshes along the southern terminus of the Delmarva Peninsula [e.g., Fisherman Island Refuge, Skidmore Island (Service ownership); Smith, Myrtle and Ship Shoal Islands (The Nature Conservancy ownership); Mockhorn Island (State Wildlife Management Area)]. These barrier islands and tidal marshes are one of the only

remaining undeveloped barrier systems in the mid-Atlantic region. Their extensive coastal salt marshes, bays, barrier beaches and interdunal ponds provide high value migration, wintering and breeding habitat for extensive numbers and variety of colonial nesting waterbirds and wading birds, migrating and wintering waterfowl and migrating Neotropical songbirds. The barrier/marsh system has been identified as a priority for protection in the North American Waterfowl Management Plan: Atlantic Coast Joint Venture (USFWS 1988) and as a United Nations Biosphere Reserve. The islands have been designated as a Western Hemisphere Shorebird Reserve Network of international importance.

**(c) When would the use be conducted?**

The Wise Point boat ramp will be open daily to recreational anglers and boaters, waterfowl hunters, and commercial watermen during normal refuge hours (½ hour before sunrise to ½ hour after sunset) with extended hours during certain seasons. The ramp will be open for 24-hour access to a limited number of permitted commercial watermen that were using the area on a commercial basis and paying a commercial rate at the time of U.S. Fish and Wildlife Service (Service) purchase (12/26/2001). The refuge may be closed at certain times (e.g., gun hunt, prescribed burning), thus impacting access to the boat ramp at those times.

**(d) How would the use be conducted?**

The entrance road will be improved and widened (in certain areas) to allow for vehicles to safely pass each other. Also, the parking lot will be improved and enlarged (in areas that are upland and presently maintained by mowing) and a boat ramp, commercial dock and commercial off-loading site will be constructed. Supporting facilities will include restrooms, lighting, an electric gate, overflow/satellite parking and signage (interpretive, regulatory and directional).

After improvements have been completed, and the area is safe for general use, a concessionaire will be contracted to manage the site. If an acceptable concessionaire is not found, management will be through the refuge fee program.

**(e) Why is this use being proposed?**

The Wise Point boat ramp is located on the deep waters of the Virginia Inside Passage which was constructed in the 1950's and bisects the refuge. Despite miles of shoreline in Northampton County, public deep water access is limited. There are six public boat access points in Northampton County (not including Wise Point), with the closest ramp on the Atlantic Ocean located 10 miles north in Oyster. On the Chesapeake Bay the closest public ramp is 3.5 miles away, at Kiptopeke State Park. Both of these ramps are used beyond capacity during certain summer days and other popular fishing times. Additionally, the Wise Point site is ideal because of its proximity to the Chesapeake Bay Bridge Tunnel, a popular fishing location. The ramp location also affords a relatively safe harbor because of the islands and marshes to the east which provide protection to boaters during storms and high winds.

There was limited historic use by both recreational and commercial users before the area became part of the Eastern Shore of Virginia Refuge. Since the area was established as a Refuge there is an expectation that this site will be available to the public because of both the demand and limited suitable sites for boat launching in the county. Additionally, there were 21 commercial watermen paying for and using this site on a commercial basis. Many of these commercial watermen have Commonwealth-leased grounds and permits for locations in close proximity to the Wise Point ramp. These watermen have a vested interest in gaining access that is proximate to their established work sites. Northampton County, which has little revenue from industrial and manufacturing businesses, is trying to balance maintaining the rural atmosphere of the County and their fiscal needs. The Wise Point boat ramp will bring dollars to the County through use by recreational boaters, ecotourism and commercial watermen in the form of job opportunities, taxation on commercial catch, and purchase of fuel, food and lodging. Thus, the Service will be a partner with the County in maintaining the area with these rural qualities.

**Availability of Resources:**

Improvements to the boat ramp and associated facilities are included in the Service's Maintenance Management System (MMS) database (51650-02003, \$445,000) and are estimated as follows:

Boat ramp.....	\$55,000 (2-lane concrete base)
Bulkhead.....	\$196,000
Courtesy tie-off.....	\$54,000
Commercial dock and mooring.....	\$104,000
Contracting, permits and miscellaneous.....	\$36,000

The entrance road and parking lot improvements and associated facilities are part of a Federal Highway TEA-21 project and are estimated as follows:

Entrance road upgrade.....	\$250,000
Pull offs.....	\$35,000
Parking area improvements and enlargement.....	\$60,000
Satellite parking development.....	\$10,000
Restrooms, lighting and fee station.....	\$20,000
Electric gate and signs.....	\$20,000
Interpretive and regulatory signs.....	\$5,000

Additional one-time costs that will not be covered by TEA-21 are:

Purchase two vehicles.....	\$40,000
Upgrade environmental education building as offices.....	\$35,000

**Total estimated construction and upgrade costs.....\$920,000**

Daily and annual fee structures will be offered for recreational boaters. Day-use permits will cost \$10 and an annual pass will cost \$120 (rates will change over time). Commercial waterman using the area and paying a commercial rate when the Service purchased the site will pay an annual fee of \$1,500 for those who dock their boats and \$600 for those who do not dock their boats (no new docking privileges will be granted). New commercial waterman and commercial waterman that were not paying a commercial fee when the Service purchased the property will be allowed to use the site commercially and will be charged \$400 annually. These new commercial users will not be granted use of the docks, reserved parking, nor 24 hour, seven days a week access. However, they will be allowed to use the unloading area for commercial catch.

If a concessionaire is contracted, they will be responsible for selling passes and ensuring the smooth and orderly operation of the boat ramp. Under this scenario, one full-time and two seasonal Law Enforcement Officers will be hired (2.08 FTEs) and administrative, management and maintenance time will be needed to manage the site. Additionally, there will be added expenses for annual maintenance, fuel and energy costs. The estimated annual costs for this option are delineated below. If the ramp is managed as a refuge fee program, an additional seasonal Law Enforcement Officer, two fee collectors and additional oversight will be needed by refuge staff.

Annual refuge costs for the upkeep and administration of the recreational and commercial boat access and commercial boat docking at the Wise Point boat ramp under a concessionaire includes:

Full-time LE Officer (GS-7/9) .....	\$64,000
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Seasonal LE Officer (0.66 FTE) (GS-5) .....	\$21,000
Seasonal LE Officer (0.42 FTE) (GS-4) .....	\$13,000
Administrative oversight .....	\$ 7,000
Fuel and energy costs .....	\$ 4,000
Road and parking lot upkeep (grading and aggregate).....	\$12,000
Maintenance of electric gate .....	\$ 2,000
Dumpster contract.....	\$ 1,000
Restroom maintenance .....	\$ 1,500
Brochures, annual permit tags, sign maintenance.....	\$ 2,500

**Annual Boat Ramp Costs.....\$128,000**

Under the concessionaire scenario, entrance and user fees will go to the concessionaire to defray the costs of managing the boat ramp. Therefore, the annual costs for managing the boat ramp, from the Service's perspective, will come from budget allocations. The information below shows funding received in fiscal year 2004. Additional funding will be required to manage this ramp in a safe and orderly manner.

FY 04 Budget Allocation included:

Salaries.....	\$559,391
Base Maintenance.....	\$26,800

**Total Available Funds.....\$586,191**

**Anticipated Impacts of the Use:** Once improvements are complete and the area is reopened to recreational boaters, there will be increased ramp usage and increased boat traffic in the surrounding waters. This increase will cause wildlife disturbance and will have an impact on water quality (both from turbidity and increased oil and gas). The Wise Point ramp will also give boaters easy access to a number of sensitive barrier islands and saltwater marshes. The barrier islands have large numbers of beach nesting (e.g., American oystercatcher) and colonial nesting (e.g., royal tern) birds that will be adversely impacted by noise, human presence, pets and litter. The concern is that nesting pairs and whole colonies could be lost if human disturbance is not controlled. Additionally, there is a concern that litter could increase the gull population, which could cause increased predation on the colonial and beach nesting birds and eggs. It is during the warm nesting season that a larger number of boaters are likely to be using the ramp and have an interest in accessing nearby beaches for strolling, shell collecting, picnics and rest breaks.

Marsh birds (e.g., black ducks, tri-colored herons, snowy egrets) will also be adversely impacted by boaters navigating the marshes. These impacts will include human presence, pets (i.e., running or barking dogs), engine noise and boat wakes.

Improvements to the boat ramp will cause some one-time disturbances to biological resources. Boat ramp and dock construction and installing mooring posts will require dredging and pumping, which will cause some temporary water turbidity. Additionally, dredging and pier/ mooring post removal may bring some previously submerged contaminants (e.g., oil, DDT) to the surface.

Installation of a culvert(s) under Ramp Lane will alter the hydrology of the impoundment. This impoundment was historically a tidally-influenced salt marsh, which was impounded by creation of the road that essentially cut the marsh off from cyclic tides. Installing a culvert(s) will improve the hydrology and assist in reverting this area to salt marsh. With the daily flushing of salt water, the invasive *Phragmites* that rings the impoundment will also be adversely impacted, and *spartina* and other salt

marsh vegetation will return. However, because of siltation and other changes that have occurred since this area was impounded, it will not immediately be the same quality marsh it once was.

Adding pull-offs to Ramp Lane to enhance driving safety will require some filling of salt marsh and cutting of vegetation along the upland areas of the road. Although engineering specifications have not been completed it is estimated that approximately one-third of an acre of wetlands will be filled and one-half acre of uplands will be cleared for pull-offs. Additionally, approximately one-half acre of uplands will be cleared for a satellite parking area.

Grading and graveling the entrance road and parking lot will cause some siltation in adjacent waters. This will cause water turbidity affecting wetland vegetation, benthic organisms and fisheries.

An electric gate will be installed which will require trenching to run electricity to the gate and installation of a magnetic plate under the road surface.

Finally, the Eastern Shore of Virginia Refuge will experience an increase in traffic within its boundaries which will cause wildlife disturbance and may also increase litter and vandalism.

**Public review and comment:** As part of the Comprehensive Conservation Planning (CCP) process for Eastern Shore of Virginia Refuge, this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft Comprehensive Conservation Plan/Environmental Assessment (Draft CCP/EA).

**Determination (check below):**

☐ Use is Not Compatibility

☒ Use is Compatible With Following Stipulations

**Stipulations to ensure compatibility:** To reduce wildlife disturbance on nearby barrier islands no pets will be allowed in the boat ramp area (thereby not allowing any pets on boats). Additionally, no personal watercrafts (PWC) will be allowed on the Eastern Shore of Virginia Refuge. Denying PWC access through this boat ramp will reduce the noise, wake and disturbance that these watercrafts often cause. Large closed area signs will be installed on the refuge barrier islands to inform boaters these areas are off-limits to foot access and boat landing. Law enforcement staff will be hired to patrol Skidmore Island and Fisherman Island Refuges. Law enforcement patrols will minimize the number of boaters illegally landing on these refuges. Additionally, law enforcement will discourage vandalism, litter and other illegal activities, as well as help ensure smooth management of the boat ramp area.

Outreach will be conducted at the boat ramp through personal contact, brochures, or signs to alert boaters to refuge regulations, specifically the restrictions on barrier island landings due to their ecological sensitivity. Parking for this boat ramp (total combined spaces at the ramp and satellite parking) will be capped at 75 parking spaces. Increasing boat access beyond this level may adversely affect the sensitive wildlife resources within the



Eastern Shore of Virginia Refuge and the surrounding barrier islands and marshes that harbor large numbers of migratory and resident birds and also provide a nursery for the abundant fisheries resources in this area.

An environmentally sound human waste disposal system (e.g., composting toilets) will be used. Solar lighting, with down-shielded lights, will also be used. No water or electrical service will be run to the site and no fish cleaning will be allowed on-site, thereby reducing the amount of food available to gulls, raccoons and other predators. An interpretive sign installed at the boat ramp will explain the sensitivity of the barrier islands and marshes and how boaters can minimize human disturbance. A training course will be developed for commercial tour guides (e.g., kayak tours) and all tour guides will be required to take a training course before taking trips from the Wise Point boat ramp. The course will focus on minimizing human disturbance to wildlife resources on barrier islands and marsh areas.

Speed bumps will be placed along the entrance to minimize vehicle speeds and a system will be designed to inform the boating public when the parking areas are full, prior to arriving at the launch site. This will reduce the number of vehicles entering when there is no parking available. Both of these details will reduce wildlife disturbance on the Eastern Shore of Virginia Refuge.

Boat docking will be phased out over time. Since the boat dock and mooring posts are in direct and sole support of a commercial use, it cannot be justified on a national wildlife refuge. Once the commercial watermen (those that met certain criteria when the land was purchased) retire or terminate commercial fishing from this site their docking rights will be relinquished. However, their other special rights (24-hour access, set aside parking) may be passed on to one heir (after the second generation all special rights will be terminated). This heir has to be a named individual (not a business) and must actively participate in commercial fisheries from this site.

We will partner with the Commonwealth to extend the no-wake zone in the Virginia Inside Passage, adjacent to refuge property. This will decrease turbidity and disturbance from increased boat usage. Baseline water quality and sediment surveys will be conducted and bi-annual surveys will be performed to determine the impacts of increased boat usage on biotic and abiotic elements. To prevent fill used for grading the entrance road and parking lot from eroding into the water, silt fencing will be used during construction.

**Justification:** Eastern Shore of Virginia Refuge was established to protect and manage migratory birds. This use has been determined to be compatible given that it will be managed at a level and in a manner that does not result in hazards to visitors, unresolvable conflicts between user groups, nor significant habitat degradation or wildlife disturbance, and provided that the stipulations referenced are implemented. Commercial and Recreational Boat Access and Commercial Boat Docking at the Wise Point boat ramp will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. This use will not pose adverse effects on trust species or other refuge resources and will not interfere with other uses being conducted on the refuge.

**Signature:**

**Refuge Manager:**

*Susan M. Rice*  
(Signature and Date)

**Concurrence:**

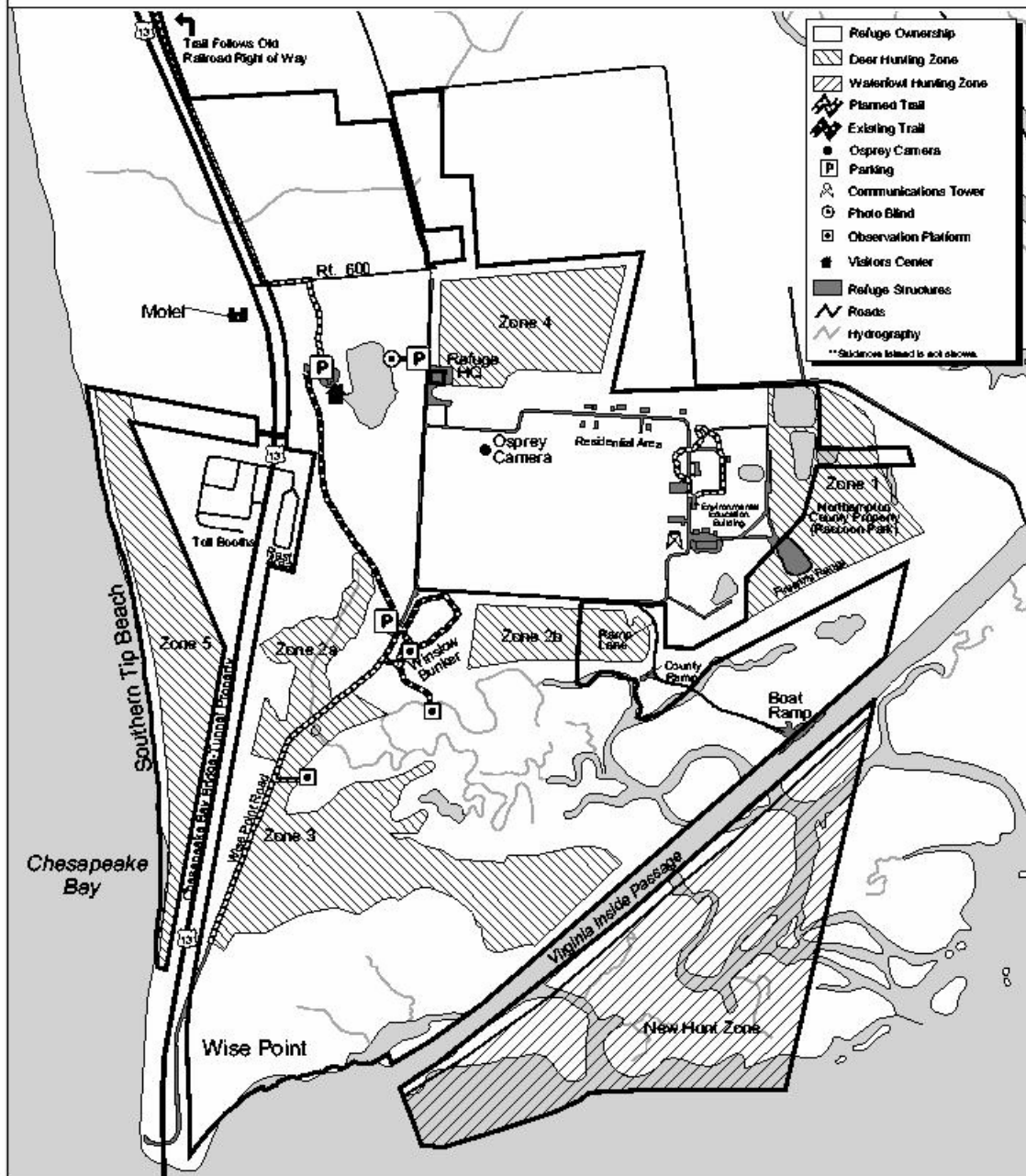
**Regional Chief:**

*Anthony D. Lege*  
(Signature and Date)

**Mandatory 10-year Re-evaluation Date:**

5/26/2014

# Public Use Opportunities Eastern Shore of Virginia Refuge



Data Sources:  
1:24,000 Hydrography & 1:100,000 Road  
data provided by USGS with source data  
of 1981 & 1989. All other data provided by  
USFWS. Projection/Elevation: UTM Zone 18,  
NAD 83, Meters.  
Map prepared for the Eastern Shore of  
Virginia NWR & Fisherman Island NWR  
Comprehensive Conservation Plan by the  
RS Cartography & Spatial Data Service  
Section, March 2003.  
This map is for planning purposes only.





## Compatibility Determination

### **Use: Hunting**

#### **Refuge Name: Eastern Shore of Virginia National Wildlife Refuge**

**Establishing and Acquisition Authority(ies):** Eastern Shore of Virginia National Wildlife Refuge (Eastern Shore of Virginia Refuge) was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. Additional parcels of land were acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge Purpose(s):**..... particular value in carrying out the national migratory bird management program. 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

..... suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..... 16 U.S.C. 460k-1 (Refuge Recreation Act)

..... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..... 16 U.S.C. 742f(a)(4) ..... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..... 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** 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.

#### **Description of Use(s):**

##### **A. What is the Use? Is the use a priority use?**

The use is public hunting. Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (USFWS 1997) as a priority public use.

##### **B. Where would the use be conducted?**

The Eastern Shore of Virginia National Wildlife Refuge has held an annual deer hunt since 1993. Hunting occurs on approximately 185 acres, which are divided into five hunt zones. Most of the hunt zones consist of deciduous forest, coniferous forest or a mix of the two, as well as some shrub habitat. These habitats support small and large mammals year round and Neotropical migratory birds during their spring and fall migrations.

As determined in the CCP we will open a portion of the newly acquired Wise Point property to deer hunting (see Map D-1). This will add approximately 40 acres to the current 185 acres open to hunting on the refuge. Hunting on this new land will be conducted in the same way as on the acreage currently open to hunting. Habitats on this acreage are similar to habitats on lands currently hunted.

We will also open a portion of the newly acquired Wise Point property to waterfowl hunting. The area that will be open to waterfowl hunting is approximately 135 acres (see Map D-1). The area is comprised

of tidal marsh bisected by extensive tidal creeks and channels. This area supports waterfowl and wading birds, and provides habitat for finfish and shellfish.

### **C. When would the use be conducted?**

Refuge hunts will be conducted during the State big game and waterfowl hunting seasons and will be in accordance with Federal and State regulations. To minimize disturbance to Neotropical migrants, hunting with guns will commence in late fall (late November and December). Waterfowl hunting will adhere to state regulations for bag limits, species, and methods of taking.

### **How would the use be conducted?**

The archery deer hunt will accommodate a maximum of 23 hunters per day. It is 12 days long with hunting from Monday through Saturday for two consecutive weeks. The archery hunt generally starts at the end of October and extends into November. The shotgun season is seven days long with hunting on Wednesdays and Saturdays in November and December. Both hunts fall within the parameters of the State hunting seasons. Refuge trails and access through the refuge remain open to the public during the archery hunt, but not during the shotgun hunt. The Visitor Center, refuge headquarters and photo blind are the only facilities open during the shotgun hunt. The hunt program achieves the biological objective of reducing the density of the white-tailed deer population.

We will work with the State to modify the deer hunt program to further reduce the deer population because refuge staff has observed heavy browsing in many areas. Taking more deer will further reduce the browse effects on vegetation. This will enable the forest understory to grow and produce more food and cover for Neotropical migrants. It will also provide additional food and cover for species such as small mammals, reptiles and invertebrates.

Waterfowl hunting will be allowed by boat only, and only in the area that lies to the southeast of the Virginia Inside Passage (see Map D-2). Waterfowl hunt season dates and bag limits will fall within the parameters of the State's waterfowl season and will be administered in a way that will cause the least disturbance to Neotropical migratory birds. Delaying hunting until December will also mitigate conflicts between waterfowl hunting and other wildlife-dependent recreational activities.

### **Why is the use being proposed?**

The refuge deer hunt achieves the biological objective of reducing the density of the white-tailed deer population. High densities of white-tailed deer can cause serious habitat degradation by heavily browsing on forest understory and shrubs. Heavily browsed vegetation leaves less food and cover habitat for migratory birds, a trust resource which the refuge is charged with protecting. A controlled refuge hunt will help keep the deer population within the carrying capacity of the habitat.

Waterfowl hunting provides a wildlife-dependent recreational opportunity and helps achieve refuge management goals and objectives. In addition, waterfowl hunting in these areas is an historic, traditional sustainable activity. Much of the marsh area on the Eastern Shore of Virginia is owned by the State and is already open to migratory bird hunting.

**Availability of Resources:** Below is a list of costs required to administer and manage the deer hunt on Eastern Shore of Virginia Refuge. We predict opening an additional 40 acres for the deer hunt will not affect these costs.

Refuge Personnel = 1/2 FTE per hunt day @ \$100/day.....	\$1,900
Dispensing hunt information .....	\$1,525
Hunter selection/lottery drawing.....	\$100
Hunter notification/mailing, etc. ....	\$300

Hunter brochure (design, printing).....	\$1,475
Permits/regulations/forms.....	\$600
Take down signs/closing and moving check station.....	\$100

**Total estimated for hunt costs.....\$6,000**

A permit fee of \$15 per participant has been collected to defray the cost of the deer hunt. The refuge has had an average of 127 hunters per year over the past three years. Therefore an average of \$1,905 is collected in permit fees. Therefore, the total net cost of the hunt is \$4,095 (\$6,000 - \$1,905). We will increase permit fees in order to recover more of our operating costs. The permit fee will increase to \$30 per participant (for all hunts conducted at both the Eastern Shore of Virginia and Fisherman Island Refuges).

Funds required to administer and manage waterfowl hunting activities will be similar to or less than deer hunting, depending on how many days we allow hunting. Below are estimated costs for administering a waterfowl hunt:

Refuge Personnel = 1/2 FTE per hunt day @ \$100/day.....	\$1,900
Dispensing Information during year.....	\$1,525
Permits/regulations/forms.....	\$600
Install and remove signs.....	\$100

**Total estimated for waterfowl hunt costs..... \$4,125**

**Anticipated Impacts of this use:** Habitats subject to deer damage include forest understory and shrub habitat that migratory songbirds depend on for food resources. Controlled deer hunting helps keep the deer population within the carrying capacity of the habitat. Heavily browsed vegetation leaves less food and cover habitat for Neotropical migratory birds, a trust resource which the refuge is charged with protecting. Modifying the hunt program to further reduce the deer population will reduce the browse effects on vegetation. This will enable the forest understory to grow and produce more food and cover for Neotropical migrants. It will also provide additional habitat for small mammals, reptiles and invertebrates.

The presence of hunters may disturb other wildlife, especially the noise from the firearms use, and hunters may trample vegetation, however these impacts are expected to be minimal. In addition, because refuge trails and most of the road system are closed during the firearms season, this causes conflicts with other users.

Opening a portion of the Wise Point marshes to waterfowl hunting will have short term disturbance on the waterfowl resting and feeding in the area. Opening 135 acres to waterfowl hunting will have few cumulative impacts since most of the marsh area on the Eastern Shore of Virginia is owned by the State and is already open to migratory bird hunting.

Hunting provides game meat and recreation for hunters. Hunters who visit the area also contribute to the local economy by staying at hotels and eating in restaurants. Providing waterfowl and deer hunting opportunities helps preserve the cultural heritage of the Eastern Shore of Virginia, where people have hunted and fished for generations.

**Public Review and Comments:** As part of the CCP process for Eastern Shore of Virginia Refuge, this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft CCP/EA.

**Determination (check below):**

☐ Use is Not Compatible

☒ Use is Compatible With Following Stipulations

**Stipulations to ensure compatibility:** The hunt program will be managed in accordance with Federal and State regulations. The deer hunt will be reviewed annually to ensure deer management goals are achieved. Both the deer and waterfowl hunts will be reviewed annually to ensure the program is providing a safe, high quality hunting experience for participants. Hunt season dates, bag limits and/or number of hunters per day will be adjusted as needed to achieve balanced wildlife population levels.

To mitigate user conflicts that arise when we close the refuge to other public uses during the shotgun season for deer, we will issue news releases and post information at the Visitor Center to notify visitors of closings.

We maintain a safe deer hunt by limiting the number of hunters per zone and by establishing a buffer zone around refuge residences and other buildings. We will maintain a safe waterfowl hunt by establishing a buffer zone by the boat ramp to ensure the safety of recreational anglers and commercial watermen using the ramp.

To minimize disturbance to migratory birds in the fall, we will conduct the waterfowl hunt after most birds have departed (i.e., after November). A later hunt will also reduce conflicts with other recreational users. During the hunt season, we will provide a law enforcement presence to insure safety and compliance.

**Justification:** Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use. Hunting deer and waterfowl on Eastern Shore of Virginia Refuge is not expected to adversely impact the targeted species. As apparent from staff observations of deer browsing, we believe there is an overpopulation of deer. Public hunting on Eastern Shore of Virginia Refuge will not interfere with nor detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the Refuge.

**Signature:**

**Refuge Manager:**

Susan M. Rice  
(Signature and Date)

**Concurrence:**

**Regional Chief:**

Cynthia D. Lege  
(Signature and Date)

**Mandatory 15-year Re-evaluation Date:**

5/26/2019

## Compatibility Determination

**Use: Archery Hunting for White-tailed Deer**

**Refuge Name: Fisherman Island National Wildlife Refuge**

**Establishing and Acquisition Authority(ies):** Fisherman Island National Wildlife Refuge (Fisherman Island Refuge) was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. An additional parcel of land on the island was acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge Purpose(s):** ..... particular value in carrying out the national migratory bird management program. 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** 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.

### **Description of Use(s):**

#### **A. What is the use? Is the use a priority use?**

Fisherman Island Refuge will open a biologically-managed white-tailed deer hunt. Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (USFWS 1997) as a priority public use. A management hunt refers to a hunt that is open to the public but is conducted based on biological needs and is not necessarily held annually. Refuge staff will perform habitat surveys for browse damage assessment and will work with State partners to assess the health and size of the white-tailed deer population. These data will be used annually to decide whether to open the refuge to hunting.

#### **B. Where would the use be conducted?**

Approximately 75 acres of upland vegetation, adjacent to the unimproved entrance road onto Fisherman Island and north and west of the Chesapeake Bay Bridge-Tunnel roadway, will be open to an archery management hunt for white-tailed deer (see Map D-2).

#### **C. When would the use be conducted?**

The hunt will be administered during the State big game hunting season and in accordance with State regulations. This archery hunt will be conducted during the Eastern Shore of Virginia National Wildlife Refuge's gun hunt season (conducted in late November and December), to minimize disturbance to Neotropical migrants.

#### **D. How would the use be conducted?**

Hunting will take place in designated hunt stand locations in the uplands adjacent to the unimproved entrance road on the west side of U.S. Route 13. We will work with the State to determine safe number of hunters for this habitat. However, it is estimated the area will accommodate between 4-6 hunters per day. This archery hunt will follow the same schedule as the Eastern Shore of Virginia Refuge shotgun hunt, typically on Wednesdays and Saturdays for seven days from late November through mid-December. However, hunt days may change if more hunters participate or if take would increase with a change of schedule, i.e., having consecutive hunt days may draw more hunters. The hunt days will be consistent

with the hunt days at the Eastern Shore of Virginia Refuge. Hunters will bring all harvested deer to the Eastern Shore of Virginia Refuge check station. One deviation of this hunt from the gun hunt is that deer will not be field dressed on Fisherman Island Refuge, rather a site will be provided on the Eastern Shore of Virginia Refuge for hunters that want to field dress their deer before departure. A second deviation will be that this will be an antlerless deer hunt only.

Safe access onto the island will be described in published annual refuge hunting regulations. All hunters will be required to attend an annual hunter orientation. The hunt program will be reviewed annually to ensure deer management goals are achieved (i.e., the resident white-tailed deer population is being reduced) and the program is providing a safe, high quality hunting experience for participants.

#### **E. Why is the use being proposed?**

Initiating a deer hunt on Fisherman Island Refuge will achieve the biological objective of reducing the density of the white-tailed deer population. High densities of white-tailed deer can cause serious habitat degradation by heavy browsing on forest understory and shrubs. Heavily-browsed vegetation leaves less food and cover habitat for migratory birds, a trust resource which the refuge is charged with protecting. A controlled management hunt may keep the deer population at levels that reduce habitat damage. However, if a public hunt is not successful in meeting these objectives other management techniques will be considered.

#### **Availability of Resources:**

The cost of opening Fisherman Island Refuge to hunting includes the following expenses:

Conducting hunter orientation.....	\$2,000
1 FTE per hunt day @ \$150/day .....	\$1,050
Dispensing hunt information .....	\$900
Hunter selection/lottery drawing .....	\$100
Hunter notification/mailing .....	\$150
Hunter brochure (design, printing) .....	\$900
Permits/regulations/forms.....	\$600
Posting hunt area and deer stand locations.....	\$500
Take down signs .....	\$100
Conducting habitat surveys .....	\$1,500
<b>Total .....</b>	<b>\$7,800</b>

Some aspects of managing this hunt will be tied into managing the existing hunt on the Eastern Shore of Virginia Refuge. However, additional costs will be incurred since the hunt will be conducted in a geographically distinct area, and because we are requiring hunter orientation and use of deer stands. Some costs will be recouped in permit fees (\$630 if all slots were filled). Presently a permit fee of \$15 per participant is being collected to defray the cost of the hunt on the Eastern Shore of Virginia Refuge. However, we are only recuperating about 40 percent of the costs of conducting the hunt. Therefore, the hunt permit fee for all hunts conducted at both the Eastern Shore of Virginia and Fisherman Island Refuges will increase to \$30 to recover more of our operating costs.

**Anticipated Impacts on Service Lands, Waters or Interest:** Opening Fisherman Island Refuge to an archery hunt will help reduce the impacts of deer browse on the island. It will provide additional food and cover for species such as songbirds, small mammals, reptiles and invertebrates. The hunt will cause some trampling of unstable dunes and vegetation. Damage to vegetation and within these unstable soils and dunes will likely incur when hunters are tracking wounded deer.

Opening Fisherman Island Refuge to a deer hunt could increase the predator population. For instance, if hunters field-dress deer on the island the entrails could attract predators and provide food to improve the health of these predators so that they could better survive the winter months. This is considered a potentially serious problem, as most other barrier islands along the Virginia coastline are plagued with avian predator issues. Because of this potential problem, no field dressing will be allowed on Fisherman Island.

Weekly tours that are conducted on Saturdays during the fall and winter will be moved to Sundays to eliminate safety issues that this will cause.

**Public Review and Comments:** As part of the Comprehensive Conservation Planning (CCP) process for Eastern Shore of Virginia and Fisherman Island Refuges this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft Comprehensive Conservation Plan/Environmental Assessment (Draft CCP/EA).

**Determination (check below):**

☐ Use is Not Compatible

☒ Use is Compatible With Following Stipulations

**Stipulations to ensure compatibility:** The hunt program will be conducted in accordance with State hunt regulations. It will be reviewed annually to ensure deer management goals are achieved and that the program is providing a safe, high quality hunting experience. Hunt season dates and bag limits will be adjusted as needed to achieve reduction of the resident breeding population of white-tailed deer. We will work with the State to determine safe numbers of hunters. The components of an Environmental Assessment (EA) will be satisfied through the Draft CCP/EA. A hunt plan will be written and approved before hunting occurs. The plan will be reviewed each year the management hunt is to take place and will provide overall documentation of permitted hunting, including the relationship of hunting to other refuge objectives.

To mitigate impacts that might cause an increase in the predator population, hunters will be required to field dress deer off the refuge. An area on the Eastern Shore of Virginia Refuge will be designated for this purpose. The refuge's no littering policy will be strictly enforced to reduce food and litter that may attract predators. This stipulation will assist in meeting our objective of reducing the number of deer on the refuge.

Hunting from deer stands will be required and access to these stands will be designated. Hunters will provide their own stand, but it must be placed in a designated location. This will reduce the amount of trampling to sensitive barrier island vegetation. Additionally, it will increase the safety of hunters that are on the island. A hunter orientation will be required of all hunters wishing to hunt on Fisherman Island. The orientation will include information on: safe access on and off the island, designated deer stand locations, and methods of reducing impacts on fragile barrier island vegetation.

This archery hunt will be conducted on the same dates as the Eastern Shore of Virginia Refuge's shotgun hunt for white-tailed deer. The late November/December dates occur after most Neotropical migrant birds have departed the area, thus ensuring disturbance is minimized. Additionally, research on Neotropical migrants takes place periodically on Fisherman Island during the migration season. The later hunt date will eliminate possible conflicts and safety issues between the two user groups.



An additional Refuge Officer will not be hired for the hunt on Fisherman Island Refuge. Rather, law enforcement officers and refuge staff that are present for the hunt on Eastern Shore of Virginia Refuge will also oversee the hunt on Fisherman Island.

**Justification:** Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use. A deer hunt at Fisherman Island National Wildlife Refuge is not expected to adversely impact the targeted species because the reduction of white-tailed deer may reduce the damage to feeding and cover habitat for Neotropical migrant species. The expected results of the hunt are improved habitat and a quality hunt experience for participants. Hunting on Fisherman Island National Wildlife Refuge will not interfere with nor detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge.

Signature:

Refuge Manager:

Susan M. Rice  
(Signature and Date)

Concurrence:

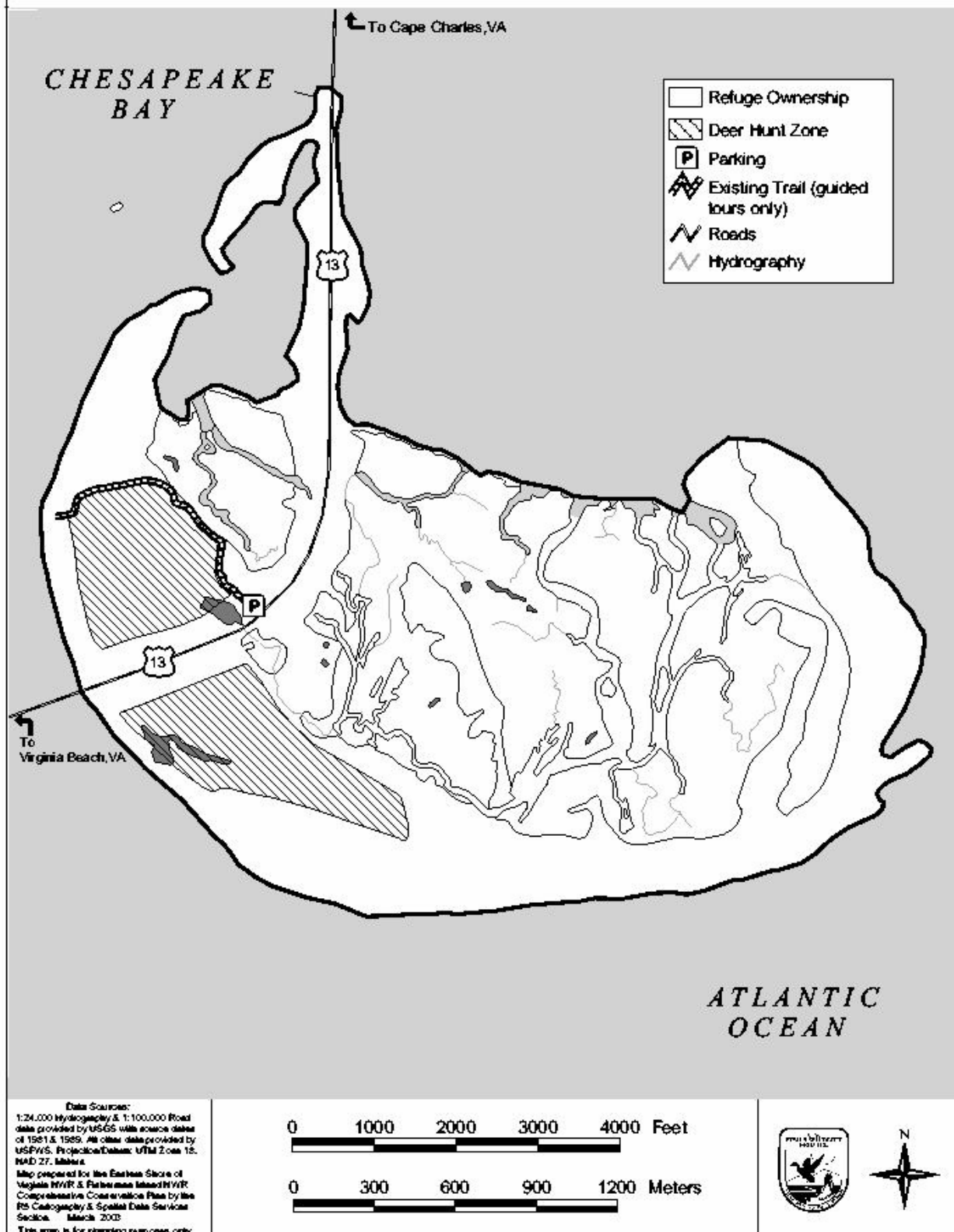
Regional Chief:

Anthony D. Legg  
(Signature and Date)

Mandatory 15-year Re-evaluation Date:

5/26/2019

# Public Use Opportunities Fisherman Island Refuge



## Compatibility Determination

**Use: Wildlife Observation, Wildlife Photography, Interpretation and Environmental Education**

**Refuge Name: Fisherman Island National Wildlife Refuge**

**Establishing and Acquisition Authority(ies):** Fisherman Island National Wildlife Refuge (Fisherman Island Refuge) was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. An additional parcel of land on the island was acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge Purpose(s):**..... particular value in carrying out the national migratory bird management program. 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)  
..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** 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.

### **Description of Use(s):**

#### **A. What is the use? Is the use a priority use?**

The uses are wildlife observation, wildlife photography, interpretation and environmental education. These uses are priority public uses, as identified in the National Wildlife Refuge Improvement Act (USFWS 1997).

#### **B. Where would the use be conducted?**

There is a 1.5 mile unimproved trail on Fisherman Island National Wildlife Refuge that goes from the parking area by the Chesapeake Bay Bridge Tunnel (Bridge-Tunnel) to the Chesapeake Bay. The staff at the Eastern Shore of Virginia National Wildlife Refuge (Eastern Shore of Virginia Refuge) conducts educational programs and guided interpretive walks on Fisherman Island Refuge from October 1 to March 15. Visitors learn about the U.S. Fish and Wildlife Service (Service) and the important role Fisherman Island Refuge plays in wildlife protection. Wildlife observation is the primary activity on the refuge. A small percentage of visitors who participate in wildlife observation are also interested in photographing wildlife.

#### **C. When would the use be conducted?**

All uses will be conducted within regular refuge hours, which are a half-hour before sunrise to a half-hour after sunset.

#### **D. How would the use be conducted?**

As determined in the CCP we will continue with the above uses. There will be no additional opportunities for wildlife observation and photography, environmental education or interpretation on the refuge.

#### **E. Why is the use being proposed?**

Wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses as defined by the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), and if compatible, are to receive

enhanced consideration over other general public uses.

**Availability of Resources:** Because we are not expanding opportunities for wildlife observation and photography, environmental education or interpretation, no additional refuge resources will be required.

**Anticipated Impacts of the Use:** The four uses will provide visitors with a unique opportunity to observe wildlife and learn about the critical habitat we manage on the refuge.

Visitor use on Fisherman Island Refuge could potentially disturb colonial and beach nesting birds. Visitors could also trample sensitive beach vegetation and cause damage to beach dunes. Walking on the trail and beach tends to displace birds that are close to those areas.

**Public Review and Comments:** As part of the Comprehensive Conservation Plan (CCP) process for Eastern Shore of Virginia and Fisherman Island Refuges, this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft Comprehensive Conservation Plan/Environmental Assessment (Draft CCP/EA).

**Determination (check below):**

☐ Use is Not Compatibility

☒ Use is Compatible With Following Stipulations

**Stipulations necessary to ensure compatibility:** To limit disturbance to colonial and beach nesting birds during the migrating and breeding seasons, we will not allow visitors on Fisherman Island Refuge between March 30 and October 15. When visitors are allowed, they will be escorted by a guide and will be restricted to the road to prevent trampling of sensitive vegetation.

Closing the refuge to public use from March 15 to September 30 has an insignificant effect on the local economy. Most of the visitors who participate in guided refuge tours do not stay overnight. Visitors may eat at local restaurants before or after visiting the refuge, so restaurants could gain if tours of the refuge were held all year round.

**Justification:** One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for the public to develop an understanding and appreciation for wildlife wherever those opportunities are compatible. Environmental education, interpretation, wildlife observation and photography are identified in the National Wildlife Refuge System Improvement Act of 1997 as priority public uses. These activities will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge.

Signature:                      Refuge Manager: Susan M. Rice  
(Signature and Date)

Concurrence:                      Regional Chief: Anthony J. Legler  
(Signature and Date)

Mandatory 15-year Re-evaluation Date: 5/26/2019



## Compatibility Determination

**Use:** This interim compatibility determination covers priority, wildlife-dependent public uses (environmental education, interpretation, wildlife observation, photography, hunting and fishing) on lands designed for acquisition.

**Refuge Name:** Eastern Shore of Virginia National Wildlife Refuge

**Establishing and Acquisition Authority(ies):** Eastern Shore of Virginia National Wildlife Refuge (Eastern Shore of Virginia Refuge) was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. Additional parcels of land were acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge Purpose(s):** ..... particular value in carrying out the national migratory bird management program.

16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

..... suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..... 16 U.S.C. 460k-1 (Refuge Recreation Act)

..... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..... 16 U.S.C. 742f(a)(4) ..... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..... 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** 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.

### **Description of Use(s):**

#### **A. What is the use? Is the use a priority use?**

The uses are environmental education, interpretation, wildlife observation, photography, hunting and fishing. These uses are priority public uses, as identified in the National Wildlife Refuge Improvement Act (USFWS 1997).

#### **B. Where would the use be conducted?**

The parcels identified in the Land Protection Plan (Appendix E) for Eastern Shore of Virginia Refuge, identify areas where the Service will seek to acquire land from willing sellers. Levels of current wildlife-dependent public use are not known for most of these areas. Since most of the parcels are in private ownership, we assume low to moderate levels of existing public use.

We have identified individual tracts of land for acquisition; however, without conducting some baseline resource inventories of these lands, it is difficult to determine which lands will be best able to support wildlife-dependent recreational uses. In general, we will allow wildlife observation, photography, interpretation and environmental education wherever these activities will least affect Neotropical

migratory bird populations and endangered species. We estimate there will be at least one but no more than two trails each on the Chesapeake Bay southern tip and seaside tracts of the designated land acquisition area. If and when we acquire parcels adjacent to Kiptopeke State Park, we will work with the Park to establish a trail and other connections to give visitors a larger area on which to engage in wildlife-dependent recreational uses.

When we acquire parcels along the Chesapeake Bay, we may open those areas to shoreline fishing and possibly other wildlife-dependent public uses.

### **C. When would the use be conducted?**

All uses will be conducted within regular refuge hours, which are a half-hour before sunrise to a half-hour after sunset. Hunting will be offered within legal hunting hours.

### **D. How would the use be conducted?**

We will allow deer and small game hunting on lands to be acquired provided there will be minimal disturbance to Neotropical migratory species. Deer and small game hunting will fall within the parameters of the State hunting seasons and will generally be permitted on forested tracts measuring 75 acres or more in size.

We will allow waterfowl hunting on any marsh blocks we acquire that are 200 acres or larger. Our waterfowl hunt season will fall within the parameters of the State waterfowl season.

Finally, we will partner with Northampton County and with local municipalities to help support local community fishing and hunting events.

### **E. Why is the use being proposed?**

Hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses as defined by the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), and if compatible, are to receive enhanced consideration over other general public uses.

**Availability of Resources:** No refuge resources will be devoted to interim public uses. Expenditures for the improvement of public use opportunities will be identified as projects in an updated Public Use Plan and in the Refuge Operating Needs System (RONS).

Before interim uses will be allowed under this compatibility determination, properties acquired will be posted. Posting will occur regardless of the potential for wildlife-dependent public uses at a site.

**Anticipated Impacts on Service Lands, Waters or Interest:** Within the designated acquisition areas, current levels of use are not known for the six priority wildlife-dependent uses defined in the National Wildlife Refuge System Improvement Act of 1997 (i.e., hunting, fishing, wildlife observation and photography, environmental education and interpretation). Impacts of such uses are expected to be minimal, provided the uses are only allowed in accordance with the stipulations listed below.

Some research suggests human intrusion in wildlife habitats, such as walking on trails, can cause disturbance to wildlife. One example is a study (Gutzwiller et al., 1997) that showed human intrusion influences avian singing behavior in some species. During breeding season, the seasonal timing of male song affects the timing of territory establishments, male attraction, pair formation, egg laying, and transmission of information about breeding songs to young (Gutzwiller, et al., 1997). Therefore, if human intrusion affects singing, it could ultimately affect reproduction and survival of some species. Another study (Riffell et al., 1996) suggests that when repeated human intrusion recurs over an extended period of time, impacts on avian reproductive fitness have the potential to accumulate temporally at the individual,

population and community levels. However, the refuge's main role in the life cycle of avian species is not during breeding but rather during migration.

Some wildlife disturbance and trampling of vegetation will occur from deer, small game and waterfowl hunting, as hunters walk around in designated areas. Shotgun noise from game and waterfowl hunting will cause some wildlife disturbance. Hunting can also cause conflict with other wildlife-dependent recreational uses such as wildlife observation and photography.

Opening land to public use can often result in litter, vandalism, and other illegal activities on Refuge lands.

**Public Review and Comments:** As part of the Comprehensive Conservation Plan (CCP) process for Eastern Shore of Virginia Refuge, this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft CCP/EA.

**Determination (check below):**

☐ Use is Not Compatible

☒ Use is Compatible With Following Stipulations

**Stipulations to ensure compatibility:** Public use areas will be monitored at various times of the year to assess wildlife disturbance. We will include information about proper etiquette and the effects of human impacts on habitat and wildlife resources in refuge publications and flyers. Periodic law enforcement will ensure compliance with regulations and area closures, and will discourage vandalism.

To limit wildlife disturbance caused by human intrusion, we will limit access on some trails during the fall migration period to protect feeding and resting habitat for migratory birds. During this time, we will offer only guided tours or we may close trails for certain periods of time. All other times of the year, trails will be open to visitors during normal refuge hours.

We will only open shoreline areas of Chesapeake Bay properties to public use if we find there are no tiger beetles present. If tiger beetles are found, we will survey the population, just as we plan to survey the population on the southern tip beach. Depending on what we learn about the population, we may allow seasonal use of the shoreline during the winter months, since tiger beetles are known to be able to withstand a moderate amount of public use.

To minimize disturbance to Neotropical migratory species, we will permit small game hunting only after the major migration period (after December 1), and we will not allow pursuit dogs. All areas will be posted and monitored for disturbance.

We will minimize conflicts between hunters and other users by hunting later in the season, when many of the prime photography and wildlife observation opportunities have past.

We will ensure resource protection and visitor safety on lands to be acquired by hiring law enforcement personnel to patrol areas and educate people about appropriate activities on refuge lands.



**Justification:** One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for the public to develop an understanding and appreciation for wildlife wherever those opportunities are compatible. Hunting, fishing, environmental education, interpretation, wildlife observation and photography are identified in the National Wildlife Refuge System Improvement Act of 1997 as priority public uses. These activities can be accomplished without conflicting with the primary mission of Eastern Shore of Virginia Refuge. These activities will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge.

Signature:

Refuge Manager:

*Susan M. Price*  
(Signature and Date)

Concurrence:

Regional Chief:

*Anthony D. Legler*  
(Signature and Date)

Mandatory 15-year Re-evaluation Date:

5/26/2019

## References

Constanzo, Gary. June 2001. Personal Communication.

Gutzwiller, Kevin J., Elizabeth A. Kroese, Stanley H. Anderson, and Charles A. Wilkins. 1997. Does human intrusion alter the seasonal timing of avian song during breeding periods? *The Auk*. 114(1):55-65.

Riffell, Samuel K., Kevin J. Gutzwiller, and Stanley H. Anderson. 1996. Does repeated human intrusion cause cumulative declines in avian richness and abundance? *Ecological Applications*. 6(2). pp. 492-505.

U.S. Fish and Wildlife Service. May 1988. North American Waterfowl Management Plan: Atlantic Coast Joint Venture. 106 pp.

U.S. Fish and Wildlife Service. 1997 National Wildlife Refuge Improvement Act 1997. Public Law 105-57- Oct. 9, 1997.

## Compatibility Determination

**Use: Research conducted by non-Service personnel**

**Refuge Name: Eastern Shore of Virginia National Wildlife Refuge**

**Establishing and Acquisition Authorities:** The Eastern Shore of Virginia National Wildlife Refuge, located in Northampton County, Virginia, was established in August 1984, by an Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes (16 U.S.C. 667b-667d), as amended, and Lands acquired under the Refuge Recreation Act (16 U.S.C. 460k-460k-4) as amended, for one or more of the following purposes: “...(1) incidental fish and wildlife -oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...”16 U.S.C. 460k-1.

**Refuge Purpose(s):** “... particular value in carrying out the national migratory bird management program.”

16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

“... suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species...” 16 U.S.C. 460k-1 (Refuge Recreation Act)

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** The mission of the National Wildlife Refuge 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.”

### **Description of Use(s):**

#### **(a) What is the use? Is the use a priority public use?**

The use is research conducted by non-Service personnel. Research conducted by non-Service personnel is not a priority public use of the Refuge System.

#### **(b) Where would the use be conducted?**

The location of the research will vary depending on the individual research project that is being conducted. The entire refuge is open and available for scientific research. An individual research project is usually limited to a particular habitat type, plant or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants or wildlife. The research location will be limited to those areas of the refuge that are absolutely necessary to conduct of the research project.

#### **(c) When would the use be conducted?**

The timing of the research will depend on the individual research project that is being conducted. Scientific research will be allowed to occur throughout the year. An individual research project could be short term in design, requiring one or two visits over the course of a few days. Other research projects could be multiple year studies that require daily visits to the study site. The timing of individual research project will be limited to the minimum required to complete the project. If a research project occurs

during the refuge hunting season, special precautions will be required and enforced to ensure public health and safety.

**(d) How would the use be conducted?**

The mechanics of the research will depend on the individual research project that is conducted. The methods of each research project will be scrutinized before it will be allowed to occur. No research project will be allowed to occur if it does not have an approved scientific method or if it compromises public health and safety.

**(e) Why is this use being proposed?**

Research by non-Service personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of the refuge's natural resources. Much of the information generated by the research is applicable to management on and near the refuge. Most research projects on the Eastern Shore of Virginia focus on avian migration. For example, researchers from the Center for Conservation Biology (CCB), affiliated with the College of William and Mary, have been mist netting saw-whet owls during fall migration for almost 10 years in order to study migration ecology and winter distribution of these birds. Another researcher from CCB has been banding raptors during fall migration for more than 20 years. This project has been looking at the concentration of flight paths of migrating raptors at the tip of the Delmarva Peninsula. The peregrine falcon is one of the project's focus species.

Researchers from the Coastal Virginia Wildlife Observatory (CVWO), a non-governmental organization, conducted a spring banding project of Neotropical migrants from 1999 through 2002. The main purpose was to determine migration ecology of this suite of birds. CVWO has also conducted butterfly and skipper surveys since 1995. Beginning in 1998, researchers also began tagging migrating monarch butterflies to learn about the migration ecology of these insects.

The Service will encourage and support research and management studies on refuge lands that will improve and strengthen natural resource management decisions. The refuge manager will encourage and seek research relative to approved refuge objectives that clearly improves land management and promotes adaptive management. Priority research addresses information that will better manage the Nation's biological resources and are generally considered important to: agencies of the Department of Interior, the U.S. Fish and Wildlife Service, the National Wildlife Refuge System, and State Fish and Game agencies; and that address important management issues or demonstrate techniques for management of species and/or habitats.

The refuge will also consider research for other purposes which may not be directly related to refuge-specific objectives, but contribute to the broader enhancement, protection, use, preservation and management of native populations of fish, wildlife and plants, and their natural diversity within the region or flyway. These proposals must comply with the Service's compatibility policy.

The refuge will maintain a list of research needs that will be provided to prospective researchers or organizations upon request. Refuge support of research directly related to refuge objectives may take the form of funding, in-kind services such as housing or use of other facilities, direct staff assistance with the project in the form of data collection, provision of historical records, conducting of management treatments, or other assistance as appropriate.

**Availability of Resources:** The bulk of the cost for research is incurred in staff time to review research proposals, coordinate with researchers and write Special Use Permits. In some cases, a research project may only require one day of staff time. In other cases, a research project may take an accumulation of weeks, as the Refuge biologist must coordinate with students and advisors and accompany researchers on

site visits. The Refuge biologist spends an average of seven weeks a year working full time on research projects conducted by outside researchers on both Fisherman Island and Eastern Shore of Virginia Refuges. At an hourly wage of approximately \$25 (for a GS-11), this adds up to about \$7,000 annually for resources spent on outside research for both refuges combined.

**Anticipated Impacts of the Use:** The Service encourages approved research to further the understanding of natural resources. Research by other than Service personnel adds greatly to the information base for Refuge Managers to make proper decisions. Disturbance to wildlife and vegetation by researchers could occur through observation, mist-netting, banding, and accessing the study area by foot or vehicle. It is possible that direct mortality could result as a by-product of research activities. Mist-netting saw-whet owls, for example, can cause stress, especially when birds are captured, banded and weighed. There have been occasional mortalities to these birds, namely when predators such as raccoons and cats reach the netted birds before researchers do. Occasionally, a raptor has been injured during capture.

Overall, however, allowing research to be conducted by non-Service personnel will have very little impact on Service interests. If the research is conducted with professionalism and integrity, potential adverse impacts far outweigh the knowledge gained.

**Public Review and Comment:** As part of the CCP process for Eastern Shore of Virginia and Fisherman Island NWRs this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft CCP/EA.

**Determination (check one below):**

☐ Use is Not Compatible

☒ Use is Compatible With Following Stipulations

**Stipulations necessary to ensure compatibility:** All researchers will be required to submit a detailed research proposal following Service Policy (FWS Refuge Manual Chapter 4 Section 6). The refuge must be given at least 45 days to review proposals before initiation of research. If collection of wildlife is involved, the refuge must be given 60 days to review the proposal. Proposals will be prioritized and approved based on need, benefit, compatibility, and funding required.

Special Use Permits (SUP) will be issued for all research conducted by non-Service personnel. The SUP will list all conditions that are necessary to ensure compatibility. The Special Use Permits will also identify a schedule for annual progress reports and the submittal of a final report.

The Regional refuge biologists, other Service Divisions, and State agencies will be asked to review and comment on complex proposals.

All researchers will be required to obtain appropriate State and Federal permits.

Researchers will be required to take certain precautions aimed at avoiding incidental take or injury of any animals. For example, if an owl caught in a mist net is taken by a predator, the net will be closed until the predator is found, trapped and removed. If a raptor injury occurs during banding, the bird will be taken to a vet and the operation will be temporarily shut down.

**Justification:** The Service encourages approved research to further understanding of refuge natural resources. Research by non- Service personnel adds greatly to the information base for Refuge Managers to make proper



decisions. Research conducted by non-Service personnel will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the Refuge was established.

Signature:      Refuge Manager: Susan M. Rice  
(Signature and Date)

Concurrence:      Regional Chief: Anthony D. Leach  
(Signature and Date)

Mandatory 10-year Re-evaluation Date: 5/26/2014

**Literature Cited:**

Department of the Interior. Departmental Manual. Washington, D.C.: U.S. Government Printing Office

U.S. Fish and Wildlife Service. 1985. Refuge Manual. Washington, D.C.: U.S. Government Printing Office.

## Compatibility Determination

**Use: Research conducted by non-Service personnel**

**Refuge Name: Fisherman Island National Wildlife Refuge**

**Establishing and Acquisition Authority:** Fisherman Island National Wildlife Refuge was established under 16 U.S. Code 667b, Public Law 80-537, an Act authorizing the transfer of certain real property for wildlife, or other purposes. An additional parcel of land on the island was acquired under the Migratory Bird Conservation Act, 16 U.S.C. 715d.

**Refuge Purpose(s):** ..... particular value in carrying out the national migratory bird management program. 16 U.S.C. 667b (an Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes).

..... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..... 16 U.S.C. 715d (Migratory Bird Conservation Act)

**National Wildlife Refuge System Mission:** The mission of the National Wildlife Refuge 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.”

### **Description of Use(s):**

#### **(a) What is the use? Is the use a priority public use?**

The use is research conducted by non-Service personnel. Research conducted by non-Service personnel is not a priority public use of the Refuge System.

#### **(b) Where would the use be conducted?**

The location of the research will vary depending on the individual research project that is being conducted. The entire refuge is open and available for scientific research. An individual research project is usually limited to a particular habitat type, plant or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants or wildlife. The research location will be limited to only those areas that are necessary to conduct the research.

#### **(c) When would the use be conducted?**

The timing of the research will depend on the individual research project that is being conducted. Scientific research will be allowed to occur throughout the year. An individual research project could be shortterm in design, requiring one or two visits over the course of a few days. Other research projects could be multiple 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 the project. If the refuge is opened to hunting, special precautions will be required to ensure public health and safety during the hunt season.

#### **(d) How would the use be conducted?**

The mechanics of the research will depend on the individual research. The methods of each research project will be scrutinized well before it will be allowed to occur. No research project will be allowed to occur if it does not have an approved scientific method or if it compromises public health and safety.

#### **(e) Why is this use being proposed?**

Research by non-Service personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of the refuge's natural resources. Much of the information generated by the research is applicable to management on and near the refuge. Most research projects on Fisherman Island study shoreline dynamics and geology, migrating birds, and colonial and beach nesting birds. For example, research on shoreline and landscape dynamics of Fisherman Island has been used to determine the origin and development of the island. A student from the College of William and Mary has been monitoring the productivity of American oystercatchers, and has banded the chicks to determine wintering migration distribution.

A group of volunteer researchers has conducted colonial waterbird surveys in mid-June on all the Virginia barrier islands, including Fisherman Island, for 30 years, to discover trends associated with these birds. Another researcher has been studying water resources and vegetation patterns on Fisherman Island.

The Service will encourage and support research and management studies on refuge lands that will improve and strengthen natural resource management decisions. The refuge manager will encourage and seek research relative to approved refuge objectives that clearly improves land management and promotes adaptive management. Priority research addresses information that will better manage the Nation's biological resources and are generally considered important to: agencies of the Department of Interior, the U.S. Fish and Wildlife Service, the National Wildlife Refuge System, and State Fish and Game agencies, and that address important management issues or demonstrate techniques for management of species and/or habitats.

The refuge will also consider research for other purposes which may not be directly related to refuge-specific objectives, but contributes to the broader enhancement, protection, use, preservation and management of native populations of fish, wildlife and plants, and their natural diversity within the region or flyway. These proposals must comply with the Service's compatibility policy.

The refuge will maintain a list of research needs that will be provided to prospective researchers or organizations upon request. Refuge support of research directly related to refuge objectives may take the form of funding, in-kind services such as housing or use of other facilities, direct staff assistance with the project in the form of data collection, provision of historical records, conducting of management treatments, or other assistance as appropriate.

**Availability of Resources:** The bulk of the cost for research is incurred in staff time to review research proposals, coordinate with researchers and write Special Use Permits. In some cases, a research project may only require one day of staff time to review proposal and write a Special Use Permit. In other cases, a research project may take an accumulation of weeks, as the Refuge biologist must coordinate with students and advisors and accompany researchers on site visits. The Refuge biologist spends an average of seven weeks a year working full time on research projects conducted by outside researchers on both Fisherman Island and Eastern Shore of Virginia Refuges. At an hourly wage of approximately \$25 (for a GS-11), this totals \$7,000 annually for resources spent on outside research for both refuges combined.

**Anticipated Impacts of the Use:** The Service encourages approved research to further the understanding of natural resources. Research by other than Service personnel adds greatly to the information base for Refuge Managers to make proper decisions. Disturbance to wildlife and vegetation by researchers could occur through observation, banding, and accessing the study area by foot or vehicle. It is possible that direct mortality could result as a by-product of research activities. For example, royal tern chick mortalities have occurred during banding. Mortalities have also occurred when gulls preyed on chicks returning to their nest after being banded.



There have been no known mortalities in the American oystercatcher colony due to researcher presence. However, these birds are easily disturbed and will readily fly off their nest when a researcher approaches. Nest abandonment can leave eggs or chicks vulnerable to heat or predators.

Overall, however, allowing research to be conducted by non-Service personnel will have little impact on Service interests. If the research project is conducted with professionalism and integrity, potential adverse impacts far outweigh the knowledge gained.

**Public Review and Comment:** As part of the CCP process for Eastern Shore of Virginia and Fisherman Island NWRs this compatibility determination has undergone extensive public review, including a comment period of 45 days following the release of the Draft CCP/EA.

**Determination (check one below):**

☐ **Use is Not Compatible**

☒ **Use is Compatible With Following Stipulations**

**Stipulations Necessary to Ensure Compatibility:** All researchers will be required to submit a detailed research proposal following Service Policy (FWS Refuge Manual Chapter 4 Section 6). The refuge must be given at least 45 days to review proposals before initiation of research. If collection of wildlife is involved, the refuge must be given 60 days to review the proposal. Proposals will be prioritized and approved based on need, benefit, compatibility, and funding required.

Special Use Permits (SUP) will be issued for all research conducted by non-Service personnel. The SUP will list all conditions that are necessary to ensure compatibility. The Special Use Permits will also identify a schedule for annual progress reports and the submittal of a final report.

Regional refuge biologists, other Service Divisions, and State agencies may be asked to review and comment on complex proposals.

All researchers will be required to obtain appropriate State and Federal permits.

Research that involves banding birds will be conducted early in the day to avoid heat stress to chicks and eggs. Researchers will minimize the number of times they visit a bird colony to minimize nest abandonment. In the case where a large number of birds are banded at once, the researcher will be required to recruit a group of trained volunteers to ensure the banding goes quickly.

**Justification:** The Service encourages approved research to further understanding of refuge natural resources. Research by non-Service personnel adds greatly to the information base for Refuge Managers to make proper decisions. Research conducted by non-Service personnel will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the Refuge was established.

**Signature:**                      **Refuge Manager:** Susan M. Rice  
(Signature and Date)

**Concurrence:**                      **Regional Chief:** Anthony D. Leg  
(Signature and Date)

**Mandatory 10-year Re-evaluation Date:** 5/26/2014

**Literature Cited:**

Department of the Interior. Departmental Manual. Washington, D.C.: U.S. Government Printing Office

U.S. Fish and Wildlife Service. 1985. Refuge Manual. Washington, D.C.: U.S. Government Printing Office.

## Appendix E

# Land Protection Plan





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Washington, D.C. 20240



In Reply Refer To:  
FWS/ANRS-CPP/017063

### Memorandum

To: Director

From: Assistant Director, National Wildlife Refuge System

Subject: Recommendation to Approve the Land Protection Plan, Eastern Shore of Virginia National Wildlife Refuge, Northampton County, Virginia.

*[Handwritten signature]*  
APR 26 2004

I concur with the attached Land Protection Plan (LPP) for Eastern Shore of Virginia National Wildlife Refuge dated March 2002, and recommend that you approve the plan. The LPP will add approximately 6,030 acres of grasslands, marshlands, forests and scrub habitat to the current acquisition boundary of the refuge. The majority of these lands will be conserved via conservation easements. The LPP was developed as a part of the Comprehensive Conservation Plan (CCP) released for public comment on September 19, 2003. This approval will allow the draft CCP to be finalized.

This plan is the result of several years of planning effort by the Service, State of Virginia, local governments and non-government organizations and, when implemented, will provide long-term protection for habitat that is used by numerous species of shorebirds, neotropical migratory birds, waterfowl, finfish and shellfish.

Concur/Do Not Concur: *Steve Williams* MAY 24 2004  
DIRECTOR

# Land Protection Plan

## Eastern Shore of Virginia National Wildlife Refuge

### I. Introduction

This Land Protection Plan (LPP) identifies an expanded acquisition area for the Eastern Shore of Virginia National Wildlife Refuge (NWR), as proposed in our Comprehensive Conservation Plan (CCP) for the refuge.<sup>1</sup> The purpose of this LPP is to:

- provide landowners and the public with an outline of U.S. Fish and Wildlife Service (Service, we, our) policies, priorities and potential protection methods for lands within the project area.
- assist landowners with determining whether or not their property is within the proposed boundary.
- inform landowners about our long-standing policy of acquiring land only from willing sellers. [No purchase of land or easement will occur if an owner is not interested in selling.]

The LPP presents methods that the Service and interested landowners can use to accomplish wildlife habitat objectives within the proposed boundary. Maps and a table with ownership information are included to help landowners understand our interest in conservation of these lands.

The maps (Appendix A) show the existing refuge, our proposed acquisition boundary, and the land parcels within this area. A corresponding table identifies each parcel, its tax map number, acreage, ownership, and our priority and recommended option for habitat protection.

Lands or conservation easements acquired will be managed to provide critical stopover habitat, in support of the millions of birds that funnel

through this key migration site. Some lands may also be managed for threatened and endangered species, or to maintain significant natural resources such as wetlands and related wildlife, or to provide public use opportunities. We propose to develop cooperative management agreements with State agency partners responsible for conservation lands in the project area.

### II. Project Description

#### Existing Refuge

The refuge is located on the southern tip of the Delmarva Peninsula in Northampton County, Virginia, at the mouth of the Chesapeake Bay (Bay). Currently, the refuge consists of 1,121 acres, including deciduous and evergreen forest, myrtle and bayberry thicket, grassland, ponds with associated fresh marsh, tidal salt marsh and beach habitats. It was established in 1984 through a transfer of excess military land, the former Cape Charles Air Force Station, for the following purposes:

- to conserve, manage and enhance habitat for use by endangered and threatened species, migratory birds and other species of fish and wildlife.
- to encourage a natural diversity of habitat and associated fish and wildlife species.
- to fulfill the international treaty obligations of the United States relating to fish and wildlife.
- to provide fish and wildlife-oriented recreation and education.

Recent land acquisition activities have included:

- purchase of the Wise Point Corporation property (376 acres, 2001), located within the acquisition boundary approved for the refuge in 1984;
- donation of two properties as mitigation for refuge habitat lost to bridge construction, added to the refuge as Categorical Exclusions under National Environmental Policy Act

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<sup>1</sup>USFWS Region 5 Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges Comprehensive Conservation Plan (Hadley, Massachusetts: April 2004).

procedures. The first is an agricultural parcel (74 acres, 1995) directly north of the visitor center, which is being restored to wildlife habitat;

- the second is a 2 ½-mile section of the 66'-wide abandoned railroad right-of-way (20 acres, 1997), from the refuge to Cedar Grove.

The existing acquisition boundary approved in 1984 included 1,337 acres (estimate, not surveyed acres). There are four remaining unacquired parcels within this original boundary (310 acres): one private ownership (160 acres, Holly Bluff Island), Northampton County ownership (60 acres, Raccoon Park), a tract of State-owned marsh between the two (approximately 89 acres), and a small electrical substation tract (1 acre) owned by Eastern Shore Public Service Company of Virginia. Although within the original boundary, the four parcels are incorporated into this proposal and listed as the first four tracts in the table.

#### Proposed Expansion

Within the mid-Atlantic Region, the lower Cape May and Delmarva (Cape Charles) peninsulas are the most significant bird migration bottlenecks known, concentrating large numbers of migrants at their southern tips. Stopover habitats at these points are critical to fall migration, and are considered some of the highest conservation priorities in eastern North America.

Due to geographic configuration, the lower Delmarva peninsula provides critical habitat for large concentrations of raptors, songbirds, other migrant landbirds, shorebirds, woodcock, and waterfowl. The southern tip has been designated an Important Bird Area by the American Bird Conservancy / National Audubon Society, in conjunction with the Partners-In-Flight (PIF) program. Many of these in-transit migrants are PIF priority species breeding in physiographic areas / Bird Conservation Regions throughout the northeast. Protection of habitat at this key stopover site is critical to the conservation of both temperate and neotropical migratory birds.

The importance of the area is also reflected in the following designations for the surrounding barrier

island / marsh-lagoon system: North American Waterfowl Management Plan focus area (Atlantic Coast Joint Venture); Western Hemisphere Shorebird Reserve Network site; United Nations Biosphere Reserve and National Natural Landmark (TNC Virginia Coast Reserve); RAMSAR site (Chesapeake Bay); Emergency Wetlands Resources Act priority site (Regional Wetlands Concept Plan). The lower county was designated as a Special Area Management Plan site, with funding and support from Virginia's Coastal Program and NOAA, which have supported several bird studies.

A primary purpose of the refuge, situated at the tip, is to provide habitat for migrants. Several studies, including the 4-state Neotropical Migratory Songbird Coastal Corridor Study, have identified habitat protection in the vicinity of the refuge as a critical need. They show that the highest concentrations of migrants occur within a 10 kilometer (6.2 miles) zone closest to the tip, in a 1.5 km wide strip (0.9 mi) bordering bayside and seaside coastlines. Because of the concentration effect, protection or restoration of habitat of any size or configuration within this "10 km zone" is important.

This LPP identifies a 6,030-acre acquisition area for the refuge, based on the 10-km zone, which will allow the Service to protect or restore additional migration habitat within the critical area of the southern tip. This will be accomplished through the acquisition of lands, conservation easements, or development of cooperative agreements.

The proposed acquisition area also provides important breeding and wintering habitat, and supports species of concern at both the federal and state levels, including the Bald eagle (Elliott's Creek area) and northeastern beach tiger beetle (Bay beaches).



### III. Status of Resources to be Protected

Although most of the Eastern Shore's barrier island and marsh system is protected, studies and experts agree on the urgent need for protection of critical forested and shrub migration habitat at the southern tip.

Historically, Northampton County has been a rural community with agriculture and seafood providing the basis of the economy. Cropland and woodland are the predominant land cover types within the proposed refuge expansion boundary, occupying 62% and 34% respectively of the land area (tidal marsh excluded) within the boundary.

Until recent times, the area had remained a relatively isolated rural agricultural area because of limited access. Construction of the Chesapeake Bay Bridge linking Washington/Baltimore with the Delmarva Peninsula, and the Chesapeake Bay Bridge-Tunnel (CBBT), linking Hampton Roads with the lower peninsula in 1964, increased the accessibility and exposure of the area. The Chesapeake Bay Bridge-Tunnel District recently completed a second bridge crossing (1998), and implemented a 24-hour round trip commuter toll (2002).

According to the recent Toll Impact Study, annual traffic on the CBBT has nearly tripled since its opening in 1964, and total traffic has increased nearly 15 percent since 1990. This trend is expected to continue, with through traffic predicted to double through 2020.

These changes have resulted in a marked recent increase in development pressure in the southern tip area. Low land prices, access to the Bay and ocean, and proximity to major population centers (Washington/Baltimore, Philadelphia/New Jersey and Norfolk/Tidewater) have drawn attention to the area by investors, second-home buyers, and retirees. Large land parcels in the vicinity of the refuge are now rapidly being subdivided and/or developed.

We recognize previous land use patterns and stewardship by local landowners as having

maintained the unique wildlife values of this area in the past. However, farms and family lands, previously maintained as larger rural parcels compatible with wildlife use and public access, are slowly being subdivided and developed.

This situation is resulting in a cumulative loss of important forested and shrub migration habitats and further fragmentation. Opportunities for restoring these habitats from agricultural lands, at the critical southern tip, will also be lost. Loss of stopover habitat at concentration sites such as this will likely result in irreversible negative impacts to neotropical and short distance migrant species, many of which are identified as Partners-in-Flight priorities.

According to the Toll Impact Study, real estate experts have suggested that the price of bayfront property has tripled over the past two to three years, sold to second home buyers, retirees and investors. Other comments were made that the county experienced the highest level of market activity (land sales) in its history in 2000, and that there are few bayfront properties left on the market. The effects of the toll discount are likely to be long-term induced development. The toll study predicts that increases in tourism, second home development, and full-time residential population will impact carrying capacity of schools, aquifers, septic and sewer systems, road facilities and land resources.

### IV. Proposed Action and Objectives

The Service will acquire lands or conservation easements from willing sellers, within the 6,030-acre proposed acquisition boundary. These lands will be managed as part of the Eastern Shore of Virginia NWR, as discussed in the attached CCP. Cooperative management agreements will be used in some cases.

Our objectives are:

- Protect existing forest and shrub migration habitat, located within the southern 10 km of

the peninsula, identified as critical to migrant landbirds.

- Restore forest and shrub habitat from agricultural lands within this same area, to widen/reconnect the vegetated migration corridor (particularly along the bayside).
- Restore several large grassland tracts from agricultural lands as opportunities occur, to provide migration, breeding and wintering habitat for declining grassland bird species.
- Protect known sites of threatened or endangered species and rare natural communities (e.g., Bald eagle and tiger beetle nesting sites).

Acquisition of lands in the proposal area will prevent significant loss of important habitat, and allow restoration of additional habitat necessary to support large concentrations of migratory birds.

#### Proposed Acquisition Area

The proposed acquisition area is based upon the 10km zone identified as critical to migrants. The boundary has been adjusted to correspond to property boundaries and identifiable features, such as roads. It extends from the tip of the peninsula north along the Chesapeake Bay shoreline to Plantation Creek, and north along the seaside shoreline up to Walls Landing Creek, just south of Capeville. It is bounded along the bayside by Route 645, and along the seaside by Route 600.

We are not interested in acquiring developed lands in the vicinity of villages or subdivisions. Our interest is to protect and restore wildlife habitat. Therefore, certain lands have been excluded from the refuge acquisition area. These are the rural village districts, as designated by Northampton County, including Cedar Grove, Magotha, Townsend, Capeville, and Cheapside. Also excluded are the bayshore subdivisions of Latimer's Bluff, Butler's Bluff, Bay Ridge, Guy's Landing, Elliott's Creek, Sugar Hill, Chesapeake Shores and Arlington Plantation.

In addition to the refuge, other conservation lands exist in the vicinity of the southern tip, including Kiptopeke State Park (535 acres), the GATR Tract (356 acres, part of the state's Mockhorn Wildlife Management Area), and the Trower Natural Area

Preserve (35 acres). These lands are not included in the refuge acquisition area. However, we are proposing to develop cooperative management agreements with the agencies responsible for these lands, to acknowledge a common goal of providing habitat for migrants. The agencies include the Department of Conservation and Recreation, both the Divisions of State Parks and Natural Heritage, and the Department of Game and Inland Fisheries.

#### Land Cover / Land Use

The majority of the lands included within the proposed acquisition area are undeveloped forest, farmland, and wetland. General land cover, land use, and wetland types within the proposed acquisition area are summarized in Tables 1 and 2. Forested habitats are dominated by mixed hardwoods and loblolly pine, with an associated shrub understory. These habitats are important to migrants. Of the approximately 1,810 acres of forest within the proposal, 460 acres are forested wetland. Over half of the land is agricultural cropland, 55%. These lands represent the potential to restore needed habitat within this critical geographic area.

**Table 1.**—General land use / land cover categories within the proposed acquisition boundary

Land cover / land use	Acres	%
Forested	1,810	30
Agricultural	3,315	55
Tidal Marsh	725	12
Open Water	120	2
Other	62	1
<b>Total</b>	<b>6,032</b>	<b>100</b>

**Table 2.**—Wetland habitats within the proposed acquisition area

Wetland type	Acres	%
Forested wetland	460	8
Tidal Marsh	725	12
Open Water	120	2
Shrub/freshwater marsh/meadow	25	<1
<b>Total</b>	1,330	23

### Maps and Ownership Table

Maps and a table listing all land parcels are provided in Appendix A. Both maps and table were produced using Northampton County tax parcel boundaries and tax database information. These are provided to inform landowners of our interest in lands within this area.

Each parcel is identified on the maps with a number which is keyed to the table, listed in the first column as LPP number (LPP NO.). The following information is provided in the table:

- Northampton County tax map, or “insert” number
- County tax parcel number
- Owner’s last name
- Acreage of the parcel
- Service priority for acquisition - the importance of the parcel to the project
- Proposed acquisition or protection method
- Zoning designation

### Land Protection Priorities

As land parcels within the proposed acquisition area are offered to the Service, and as funds become available, acquisition priority will be based on habitat type and location, as follows:

**Priority 1:** Parcels with significant (over 1 acre) tracts of existing forested or shrub migration habitat, located at the southern tip (from Cedar Grove south) and along the bayside shoreline (between the bayshore and Route 645, north to Plantation Creek). This area supports higher densities of high-volume migrants than the seaside (approximately 3:1) for two main reasons:

1) greater forest and shrub understory diversity, producing more food, and 2) a “reverse migration” phenomenon causing re-distribution of migrants into bayside habitats. In addition, this is a high priority because the threat of habitat loss to subdivision and development is more immediate.

**Priority 2:** Parcels with significant (over 1 acre) tracts of existing forested or shrub migration habitat, located along the seaside coastline (between the seaside coastline and Route 600, from Cedar Grove north to Walls Landing Creek). While still within the critical lower 10k area, bird densities are not as high as on the bayside. Also, due to topography, this side of the peninsula supports more extensive forested/shrub wetland transition zone grading into tidal marsh, and offers greater opportunity for wetland and riparian buffer restoration.

**Priority 3:** Parcels that consist of predominantly agricultural land with no existing forest or shrub (less than an acre) and no coastal connection. Although unvegetated, these lands are important because they offer the opportunity to restore migration habitat within the 10km geographic area. Such opportunities are important to attempt to offset future habitat losses to subdivision and development within this area.

**Priority 4:** Those relatively small parcels, generally less than 5 acres, that include collections of buildings such as residences, farm houses, barns, various tractor and equipment sheds, farm storage or processing buildings. Our intention is not to acquire residences and buildings, but to protect or restore habitat, so these parcels will be evaluated on a case-by-case basis.

Table 3 presents a summary by method and priority. See Appendix A for the details on each parcel. The CCP will incorporate our approved final LPP as a management action in support of land protection goals and objectives.

**Table 3.**—Acquisition Area Summary, by Method and Priority

Priority	Method	Acres	Parcels
1	Cooperative Agreement	122	2
1	Fee	1	1
1	Easement	41	1
1	Fee or Easement	4,743	98
2	Fee or Easement	668	18
3	Fee or Easement	424	45
4	Fee	33	21
<b>Total</b>		6,032	186

## V. Protection Options

The following protection options were considered in the development of our proposed action, presented in detail in Appendix A. They include:

- no Service action
- management or acquisition by others
- less-than-fee acquisition by the Service
- fee acquisition by the Service

Service land protection policy is to acquire only the minimum interest necessary to meet the refuge’s goals and objectives, and only from willing sellers.

We are proposing varying levels of Service action within the project area. A combination of the protection options outlined below will be used, including assistance and support to conservation partners and landowners, acquisition and management by others, and purchase of lands or conservation easements by the Service.

We believe this combination approach is a cost-effective way of providing the minimal level of protection needed to accomplish project objectives, while also attempting to meet the needs of landowners. As parcels become available in the future, however, changes in the protection option for a specific parcel may be warranted to ensure we are using the option that best fits the situation at that time.

## Option 1.—No Action

Under Option 1, we would maintain present refuge acquisition boundaries; we would not expand the refuge or otherwise attempt to protect additional migration habitat. Our draft CCP/EA evaluates this option as “Alternative A: No Action (Current Management).” We did not select this approach as our proposed action because:

- It will not adequately protect important migration habitat, Bald eagle and tiger beetle nesting sites, and wetland habitat in the project area;
- Service action has been recommended and supported by our State and non-profit conservation partners, as part of a cooperative effort.

Regulatory land use controls do exist for the area, including county zoning and Chesapeake Bay Preservation Act restrictions. The County’s Comprehensive Plan reflects local support of the area’s natural resources (including migratory birds), seen as vital to the community’s economic well being. Because of accelerating development pressures, a proposed new zoning overlay, called the Southern Tip Rural District, is currently under consideration to help protect sensitive natural areas, vegetative cover, and habitat.

However, much of the project area is highly developable upland, either forestland or prime agricultural soils. Further subdivision, forest clearing, and residential development is allowable within the proposed 6,032-acre acquisition area under current zoning regulations. Zoning within the area is as follows.

**Table 4.** — Zoning status

Zoning Designation	Acres	%
Agricultural (A-1)	3,856	63
Agricultural Forest District (AFD)	1,650	27
Residential (RV-R)	232	4
Exist. Business- Commercial General (EB-CG)	41	< 1
Conservation (C)	310	5

The majority of lands within the project area, over 90 percent, are zoned Agricultural (A-1) and Agricultural/Forestal District (AFD). While the county does place importance upon preserving prime agricultural soils and woodland, the Agricultural zoning allows an overall residential density of one unit per 20 acres. Sliding scale “bonus” lots of 20,000 square feet may be divided from parcels, based on buildable area, with parcels as small as 7 acres possibly supporting 2 lots.

The Agricultural/Forestal District is an overlay district intended to support continued agricultural and forestry use through reduced-tax status. Lands can be removed from the program for subdivision and development, however, with payment of back taxes.

The Chesapeake Bay Preservation Act (1988) provides for protection of high-quality state waters, through pollution reduction regulations and development restrictions within designated Resource Protection Areas. These include shoreline, tidal wetlands, and 100-foot buffer zones. Northampton County also applies this status to the seaside, and adjacent Resource Management Areas have been designated. In reality, development or clearing of shorelands has continued throughout the state under these designations, which have not been strictly enforced with variances often granted.

The lower peninsula is presently threatened by rapid commercial and residential development which, in its present form, is incompatible with the maintenance of vegetated stopover habitat. Large tracts within the project boundary are being subdivided or developed, resulting in a cumulative loss of key habitats.

The October 2001 Chesapeake Bay Bridge-Tunnel Commuter Toll Impact Study projected that the lower third of the County would attract 70 percent of the new residential and commercial growth induced by reductions in the Bridge toll. As a result, up to 45% of the undeveloped land in this part of the county will be permanently converted if no action is taken.

The study estimated that new development could eventually occupy up to 10,536 acres of farmland and forests. The bayside tracts most critical to migratory songbirds are already being subdivided at a rapid pace, and land prices have escalated since implementation of the commuter toll, March 2002 .

### **Option 2.—Management or Acquisition by Others**

Under Option 2, we would continue to support the activities of our partner organizations and agencies within the project area, such as the Virginia Department of Game and Inland Fisheries, the Virginia Department of Conservation and Recreation (DCR), the Virginia Natural Heritage Program, the Virginia Coastal Program, The Nature Conservancy, the USDA Natural Resource Conservation Service, and interested local landowners.

Recent support provided by the Service for land protection projects in Northampton County has included: a \$798,000 National Coastal Wetland Grant for the conservation component of the county’s Sustainable Technologies Park; similar grants to Virginia DCR’s Division of Natural Heritage for Savage Neck and TNC for Elkins Marsh; and active support and participation in the addition of the Parsons property to Kiptopeke State Park. TNC and the Trust for Public Lands have historically provided land acquisition support to the refuge.

Although our partners provide land with some level of protection, they often do not have the financial or administrative resources to buy all those lands, nor can they always actively manage the parcels to protect our priority species. The proposed action (Appendix A) assumes these groups will continue to buy lands in the project area, subject to their own funding limitations. However, without our contribution to land protection, many lands identified as important to wildlife would likely be converted to other uses. The collective partnership effort has identified a Service acquisition and management role as critical to long-term protection of these significant natural resources.

While the Service already has a cooperative management agreement in place for the county's Raccoon Park tract adjacent to the refuge, we propose to develop similar cooperative agreements with: 1) the Department of Conservation and Recreation for Kiptopeke State Park; 2) the Department of Game and Inland Fisheries, for the Mockhorn Wildlife Management Area tract north of the refuge, and a marsh tract within the acquisition boundary south of the refuge (LPP tract 1); and 3) the Virginia DCR Division of Natural Heritage for the Trower Natural Area Preserve. We can agree to work together to complement each other's management approaches and activities, to the extent possible, in support of the area's migratory bird resources.

### **Option 3.—Less-than-fee Acquisition**

Under Option 3, we would accomplish our habitat objectives by purchasing only a partial interest, a conservation easement. The parcel would remain in private ownership, while allowing us some ability to manage land use. The easement would be structured to assure the permanent protection of existing forested and shrub habitat, allow habitat management/improvement, manage access if endangered or threatened species are present, and possibly provide limited public use opportunities if the landowner is willing.

In order to accomplish these objectives, we would purchase the development and timber rights, and possibly access or hunting rights. Easements are property rights and are usually perpetual. If a landowner sells his/her property after selling an easement to us, the easement continues as part of the title. Properties subject to easements generally remain on the tax roll, although the assessment may be reduced by the reduction of market value. The Service does not make revenue-sharing payments for easement rights.

In general, an easement would maintain the land in its current configuration with no further subdivision. Easements are appropriate for use where:

- Only minimal management of the resource is needed, such as in places where the

management objective is to allow forest to remain and provide habitat for migratory and resident songbirds;

- A landowner is interested in maintaining ownership of the land, does not want it to be further developed, and would like to realize the financial benefits of selling development and timber rights.

For parcels with lands in agriculture, the landowner could retain agricultural rights and continue farming, or sell those rights to us. In the latter case we would restore the farmland to vegetated habitat over time.

Determination of value for purchase of a conservation easement involves an appraisal of the rights to be purchased, based on recent market conditions in the area.

### **Option 4.—Fee Acquisition**

Under Option 4, we would acquire parcels in fee title from willing sellers, thereby purchasing all rights of ownership. Fee ownership will assure the permanent protection of existing forested and shrub migration habitat, and allow refuge staff to:

- conduct activities such as habitat management/ improvement,
- provide public use opportunities and manage access,
- and manage for endangered or threatened species.

Fee purchase, at market value, is the most expensive method but allows the Service maximum management flexibility. This method would allow us to conduct active habitat improvement projects, such as thinning of dense pine overstory to promote understory shrub growth for migrants, and invasive plant management in general. It would allow the greatest ability for the refuge to provide additional public use opportunities. It would also provide the opportunity to restore some agricultural lands to forest and shrub, within this critical stopover area.



In most cases, for privately-owned parcels within the proposed boundary that contain tracts of forest critical to migrants, either fee purchase or conservation easements could accomplish our habitat protection objectives. Both are listed in appendix A interchangeably as options, to better meet the needs of landowners.

It may become necessary in the future to convert a conservation easement to fee acquisition. For example, when an owner is interested in selling the remainder of interest in the land. We will evaluate this need on a case-by-case basis.

### Options Considered but Dismissed

We considered the action of leasing farmlands to restore migration habitat, such as possibly “resting” farm fields and rotating them out of production for a number of years to provide grassland habitat for birds. A lease would be a short-term (usually 5 to 10 years) agreement for full or specified use in return for a rental payment (usually annual) and generally includes occupancy rights. The rights revert back to the owner at the termination of the lease. This device is useful when the objectives are short term. The property remains on the tax rolls during the term of the lease.

This method does not offer permanent long-term protection and does not appear to be cost effective, given limitations on use and amounts of funding available. However, we plan to promote and facilitate habitat restoration programs offered by the Natural Resources Conservation Service, the Farm Services Administration, and our own Partners for Wildlife program within the project area. The refuge will assist interested landowners with existing programs that provide funding, materials, and technical assistance to restore permanent riparian buffers and other vegetated habitats, such as the Conservation Reserve Program and Wetland Reserve Program.

## VI. Acquisition Methods

We can use four methods of acquiring either a full or partial interest in parcels within the proposed acquisition boundary, if landowners are interested: (1) purchase (e.g., fee title, or a partial interest like a conservation easement), (2) donations, (3) exchanges, and (4) transfers. Our proposed method has been listed in Table 1 for each tract within the refuge acquisition boundary.

### Purchase

For the majority of tracts within the boundary, the proposed method is listed as **Fee** or **Easement**. For those parcels we can accomplish our objectives through either method. The method used is partly dependant on the landowner’s wishes.

**Fee** purchase involves buying the parcel of land outright from a willing seller in fee title (all rights, complete ownership), as the availability of funding allows. Fee ownership will assure the permanent protection of existing forested and shrub migration habitat, and allow refuge staff to conduct activities such as habitat management/improvement, provide public use opportunities and manage access, and manage for endangered or threatened species. It would also give the Service the ability to restore some agricultural lands to forest and shrub, within this critical stopover area.

**Easement** refers to the purchase of limited rights (less-than-fee) from an interested landowner. The landowner retains ownership of the land, and would sell certain rights to the Service, to be identified and agreed upon by both parties. Our conservation easement objectives would again be to assure the permanent protection of existing forested and shrub habitat, allow habitat management/improvement, manage access if endangered or threatened species are present, and possibly provide limited public use opportunities if the landowner is willing.

In order to accomplish these objectives, we would be willing to purchase at least the development and timber rights, and possibly the ability to control access or manage hunting. Easements are

property rights and are usually perpetual. If a landowner sells his/her property, the easement continues as part of the title. Properties subject to easements generally remain on the tax rolls, although the assessment may be reduced by the reduction of market value. The Service does not make revenue-sharing payments for easement rights it owns.

#### *Funding for Fee or Easement Purchase*

Much of our funding to buy land comes from the Land and Water Conservation Fund (LWCF), which is derived from certain user fees, proceeds from the disposal of surplus Federal property, the Federal motor boat fuels tax, and oil and gas lease revenues. About 90 percent of that fund now derives from Outer Continental Shelf oil and gas leases. The Federal Government receives 40 percent of that fund to acquire and develop nationally significant lands. Another source of funding to purchase land is the Migratory Bird Conservation Fund (MBCF), which derives from Federal Duck Stamp revenue.

We plan to use both funds to buy either full or partial interests in lands within the project area. LWCF funds will be used to acquire land and easements that consist mainly of forest and agricultural fields, roughly 80% of the proposed expansion area. MBCF funds may be used for properties that include large tracts of tidal marsh or forested wetlands important to waterfowl, the remaining 20%. North American Wetland Conservation Act funding is another potential source for this latter category.

#### **Donation**

We generally encourage donations in fee title or conservation easement within the approved areas, assuming management concerns, such as contaminants, are not a major issue. Owners sometimes choose to donate all or a portion of their land because of tax advantages or as a lasting memorial. We are not currently aware of any opportunities to accept donations of parcels within our proposed boundary, but would evaluate them on a case-by-case basis as they arise.

#### **Exchange**

We have the authority to exchange land in Service ownership for other land that has greater habitat or wildlife value. Inherent in this concept is the requirement to get dollar-for-dollar value, with, occasionally, an equalization payment. Exchanges are attractive because they usually do not increase Federal land holdings or require purchase funds; however, they also may be very labor-intensive, and take a long time to complete.

#### **Transfer**

Property can be transferred to the Service through the General Services Administration (GSA) under the Federal Property and Administrative Service Act (63 Stat. 377) and Public Law 80-537 (62 Stat. 240). The refuge was originally established in 1984 through transfer land declared excess by the military, formerly the Cape Charles Air Force Station. The only property within the proposal area for which transfer could be a potential method is the 60-acre County property within the refuge's original acquisition boundary, LPP Tract 3.

This is former Federal land, transferred to the County at no cost when the military base closed. It could be voluntarily reverted back, through the National Park Service to the General Services Administration, for transfer into the Refuge System. The Service already has a Cooperative Agreement in place with the County for management of this tract.

#### **Service Land Acquisition Policies**

Once a refuge acquisition boundary is approved we will contact landowners to determine if any are interested in selling. If a landowner expresses an interest and gives permission, a real estate appraiser will appraise the property to determine the market value. Once an appraisal is conducted, we can present an offer for the landowner's consideration.

The Service's established policy is to work with willing sellers, as funds become available. We will continue to operate under this long-standing policy. Appraisals are conducted by Service or

contract appraisers and meet federal as well as professional standards. The Service is required by law to purchase properties at fair market value, based on comparable sales of similar types of properties.

The acquisition boundary is based on biological importance of key habitats, and merely gives the Service the approval to negotiate with landowners that may be interested, or become interested in the future. With internal approvals in place, the Service can react more quickly if these important lands become available. Lands within this boundary do not become part of the refuge unless sold or donated to the Service.

A landowner may choose to sell land to the Service in fee simple and retain the right to occupy an existing residence. This is referred to as a **“life-use reservation.”** As the name implies, life-use reservations apply to the seller’s lifetime, but they can also apply for a specific number of years. At the time we acquire the parcel, we would discount from the appraised value of the buildings and land the term of the reservation. The occupant would be responsible for the upkeep on the reserved premises. We would own the land, and make revenue-sharing payments to the County.

In rare circumstances “friendly condemnation” can be used at the request of a seller. Although the Service has a long-standing policy of acquiring land only from willing sellers, it does have the power of eminent domain, like other Federal agencies. Friendly condemnation is used when the Service and a seller cannot agree on property value, and both agree to allow a Court to determine fair market value. Or, where we cannot determine the rightful owner of a property, we may use friendly condemnation to clear title. We do not expect to use friendly condemnation very often, if at all.

## VII. Coordination

The Service has participated in a loosely-organized Southern Tip Partners planning group since the mid-80's. This local partnership has promoted and facilitated protection of the area's important natural resources while encouraging sustainable economic development and eco-tourism. The group has included participation from:

Northampton County  
Commonwealth of Virginia State Delegate  
U.S. Representative Bateman's, Davis', and  
Schrock's Offices  
The Nature Conservancy  
Local landowner representatives  
Virginia Dept. of Game and Inland Fisheries  
Virginia Dept. of Conservation and Recreation  
Virginia Coastal Program  
The Trust for Public Lands  
other invited participants/researchers/officials.

Several goals of this partnership’s original 1987 plan have been accomplished, including expansion of the refuge, completion of the adjacent Fisherman Island NWR, creation of nearby Kiptopeke State Park, and establishment of a Refuge visitor center.

We continue to receive support from and work closely with the Virginia Department of Game and Inland Fisheries, the Virginia Division of Natural Heritage, Kiptopeke State Park, Virginia Tech's National Fish and Wildlife Information Exchange, the Virginia GAP Analysis Project, the Center for Conservation Biology at the College of William and Mary, the Coastal Virginia Wildlife Observatory, and other researchers. The Service’s Delaware Bay Estuary Project office supported planning with its Delmarva Conservation Corridor analysis.

The Service has assisted Northampton County with its Port of Cape Charles Sustainable Technology Industrial Park, through a \$798,000 National Coastal Wetlands Grant for habitat protection. This project was designated by the President's Council on Sustainable Development as the only rural of four national demonstration

sites. Other National Coastal Wetlands Grants have been approved elsewhere in the county, including TNC and Division of Natural Heritage proposals.

As part of the draft CCP/EA planning process, we convened a biological workshop to gather input from experts and researchers regarding wildlife status and needs on the lower peninsula. We also held three open-house public meetings and sent out newsletters and surveys to solicit public comments on various refuge aspects and issues, including Service land acquisition. Comments regarding expansion of the refuge and protection of additional habitat were supportive.

This LPP will be distributed to all affected landowners, our conservation partners, County offices, and others. It was previously available for a public comment and discussed in public meetings.

## VIII. Socioeconomic and Cultural Impacts

The history and culture of the Eastern Shore have been intimately tied to these migratory bird resources for generations and would be severely impacted by their loss. Ecotourism based on these avian resources has become a local growth industry. The fall migration of neotropical birds on the lower peninsula is the subject of an annual birding festival that generates income for numerous hotels, restaurants, and other tourist facilities. The proposed project is non-invasive and will have no negative impacts on any existing cultural or historical resources.

The Refuge contributes to the economy of Northampton County by keeping land in permanent open space. This benefit was documented in a “Cost of Community Services Study(COCS)” for Northampton County, Virginia (Adams, et. al., 1999). A COCS is a case study analysis of the net fiscal impacts of different land uses. It provides a snapshot in time of costs versus revenues based on current land use. These studies are based on real budgets for a specific community. The analysis shows what services

private residents receive in return for the taxes they pay to their local community.

These studies have shown time and again that open space costs towns less than residential or commercial development. The reason for this is because residential, and to a lesser extent commercial development, requires certain town services such as schools, utilities, and emergency services. Although residential and commercial development increases a town’s tax base, expenses incurred by the town for increased services far outweigh the taxes generated from residential and commercial uses.

The Refuge also directly contributes to the local economy of Northampton County through “Refuge Revenue Sharing” payments. The federal government does not pay property tax on Refuge lands, but instead makes annual payments to respective counties based on a maximum of 0.75 percent of the fair market value of Refuge lands, as determined by an appraisal every five years. The actual amount distributed each year varies and is based on Congressional appropriations in a given budget year. The amount distributed also changes as new lands are acquired. The table below depicts the amounts distributed to Northampton County between 1995 and 2002.

**Table 5.** Refuge Revenue Sharing payments from Eastern Shore of Virginia and Fisherman Island Refuges to Northampton County.

	Number of Acres		Total Paid to Northampton County	
	Eastern Shore of Virginia Refuge	Fisherman Island Refuge	Eastern Shore of Virginia Refuge	Fisherman Island Refuge
<b>1995</b>	725	1,000	\$12,241	\$6,995
<b>1996</b>	725	1,000	\$16,388	\$9,364
<b>1997</b>	745	1,000	\$16,745	\$9,427
<b>1998</b>	745	1,825	\$10,583	\$16,808
<b>1999</b>	745	1,850	\$9,403	\$15,650
<b>2000</b>	745	1,850	\$8,249	\$13,728
<b>2001</b>	745	1,850	\$8,419	\$14,012
<b>2002</b>	1,121	1,850	\$11,712	\$13,090

The traditional villages and towns of the area are surrounded by farm lands and water, which provide livelihood to its residents and recreation to its visitors. Recreation includes deep water fishing, crabbing and shellfishing, camping, boating, beach-going, bicycling, hunting, canoeing, kayaking, and bird watching.

The area can be considered a seasonal destination area. Because of its location and natural amenities, tourism plays a larger role in its economy than the industry does for the state as a whole. A residential and marina community is under development, with associated recreational uses, including golf, boating and beachgoing.

We do not predict any significant adverse socioeconomic or cultural impacts. Towns will benefit from increased refuge revenue sharing payments, savings on the cost of community services, increased property values, increased watershed protection, maintenance of scenic values, and increased revenues to local businesses from refuge visitors.

We would continue to promote the six priority wildlife-dependent recreational uses of the National Wildlife Refuge System, including hunting, fishing, wildlife observation and photography, and environmental education and interpretation, where they are compatible with the management purposes of each refuge. The refuge currently has a hunting program, a wildlife trail system, wildlife observation sites, and environmental education stations. These would be expanded to new lands acquired. However, we would eliminate non-wildlife-dependent activities for lands that we acquire.

Refuge lands would increase protection for cultural resources in the area. Service ownership would protect known cultural sites against vandalism, and would protect as yet unidentified or undeveloped cultural sites from disturbance or destruction. Our interpretive and environmental education programs will continue to promote public understanding and appreciation of the area's rich cultural resources.

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## **Appendix A. Parcel Maps and Table**

The maps show existing refuge lands, our acquisition area, and all land parcels within that area. The corresponding table lists each parcel, its tax map and parcel number, ownership, acreage, our priority and recommended method for acquisition, and county zoning designation. The information is based on Northampton County GIS Tax Data as of March 2004.

We will acquire either full or partial interest in land parcels by fee purchase, as available from willing sellers over time and as the availability of funding allows. We also propose to develop cooperative management agreements with the county and several state agencies, for public lands within the project area. Definitions of each table column head follow.

<b><u>LPP tract number</u></b>	<u>our numerical identifier for each parcel within the proposed acquisition boundary</u>
<b><u>Tax Map</u></b>	<u>Northampton County tax map, or “insert” number</u>
<b><u>Tax Parcel ID</u></b>	<u>Northampton County tax parcel identification number</u>
<b><u>Ownership</u></b>	<u>agency, organization, company or private landowner’s last name</u>
<b><u>Acres</u></b>	<u>acreage from Northampton County tax database</u>
<b><u>Priority</u></b>	<u>Priority 1: those parcels with significant (over 1 acre) tracts of existing forested and shrub migration habitat, located in the critical immediate southern tip area (from Cedar Grove south) and along the bayside shoreline (between the bayshore and Route 645) north to Plantation Creek</u> <u>Priority 2: those parcels with significant (over 1 acre) tracts of existing forested and shrub migration habitat, located along the seaside coastline (between the seaside coastline and Route 600) from Cedar Grove north to Walls Landing Creek</u> <u>Priority 3: those parcels that consist of predominantly agricultural land with no existing forest or shrub (less than an acre) and no coastal connection</u> <u>Priority 4: those relatively small parcels, generally less than 5 acres, that include collections of buildings such as residences, farm houses, barns, various tractor and equipment sheds, farm storage or processing buildings. Our intention is not to acquire residences and buildings, but to protect or restore habitat, so these parcels will be evaluated on a case-by-case basis</u>
<b><u>Acquisition Method</u></b>	<u>For lands within the proposed boundary, whether we would acquire fee title or conservation easement (see discussion in “Acquisition Method”), or if we are proposing to develop a management agreement</u>
<b><u>Zoning designation</u></b>	<u>Northampton County zoning designation for each parcel</u>

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
1	123	A	3	COMMONWEALTH OF VIRGINIA	89.00+	1	COOPERATIVE AGREEMENT	C
2	123	A	2	HEHL PROPERTIES L.L.C.	160.00	1	FEE or EASEMENT	C
3	118	A	8	NORTHAMPTON COUNTY	10.00	1	COOPERATIVE AGREEMENT	C
3	118	A	9	NORTHAMPTON COUNTY	50.49	1	COOPERATIVE AGREEMENT	C
4	117	A	23	EASTERN SHORE PUBLIC SERVICE CO. OF VA.	0.91	1	FEE	A-1
5	118	A	5	DIXON	380.00	1	FEE or EASEMENT	AFD
6	118	A	4	DIXON	2.00	4	FEE	A-1
7	117	A	21	MILLER	2.11	4	FEE	A-1
8	117	A	20	LATIMER	2.53	4	FEE	A-1
9	117	A	24	SHORE LANDVEST INC. (SUNSET BEACH RESORT)	41.00	1	EASEMENT	EB-CG
10	117	A	18A	DIXON	12.05	1	FEE or EASEMENT	AFD
11	117	A	17	DIXON	74.00	1	FEE or EASEMENT	AFD
12	117	A	15	DIXON	46.00	1	FEE or EASEMENT	AFD
13	117	A	14	DIXON	7.00	1	FEE or EASEMENT	AFD
14	117	A	13	TROWER	5.00	1	FEE or EASEMENT	A-1
15	118	A	13	LAMBERTSON	73.63	1	FEE or EASEMENT	A-1
16	117	A	12	WILLIAMS	1.00	4	FEE	A-1
17	118	A	2	BULL	669.30	1	FEE or EASEMENT	AFD
19	118	1	A	VALENTINE	0.35	4	FEE	A-1
20	117	A	10B	EDMUNDS	5.37	3	FEE or EASEMENT	A-1
21	117	A	10A	EDMUNDS	5.00	3	FEE or EASEMENT	A-1
22	117	A	11	WELLS	0.43+	4	FEE	A-1
23	117	A	9	SPADY	108.00	1	FEE or EASEMENT	A-1
24	117	A	6E	LATIMER	1.00	4	FEE	A-1
25	117	2	E	LATIMER	33.30+	1	FEE or EASEMENT	A-1
26	117	A	1	DICKINSON	7.08	1	FEE or EASEMENT	A-1
27	117	1	B1	LATIMER	32.50	1	FEE or EASEMENT	A-1
28	117	A	4	HEATH	2.03	4	FEE	A-1
29	117	A	6B	LATIMER	2.71	1	FEE or EASEMENT	A-1
30	117	A	6C	SPENCER	1.04	4	FEE	A-1
31	117	A	6A	LATIMER	1.00	4	FEE	A-1
32	117	A	6D	LATIMER	3.04	1	FEE or EASEMENT	A-1
33	112	A	109	PARSONS	55.00	3	FEE or EASEMENT	A-1
34	117	A	8	DICKINSON	130.00	1	FEE or EASEMENT	A-1
35	112	A	107A	PARSONS	24.00	1	FEE or EASEMENT	A-1
36	112	A	107B	BULL	28.23	1	FEE or EASEMENT	A-1
37	113	A	67	JONES	8.32	3	FEE or EASEMENT	A-1
39	113	1	A	LEWIS	1.00	3	FEE or EASEMENT	A-1
40	113	1	B	LEWIS	1.50	3	FEE or EASEMENT	A-1
41	113	1	C	LEWIS	1.50	3	FEE or EASEMENT	A-1
42	113	A	66	RICHARD	3.06	4	FEE	A-1
43	113	1	D	LEWIS	4.44	4	FEE	A-1
44	113	A	64	JONES / GOODWYN	164.41	1	FEE or EASEMENT	A-1
45	113	A	64A	JONES	0.68+	3	FEE or EASEMENT	A-1
46	112	4	C2	HEATH	57.77	1	FEE or EASEMENT	A-1
47	112	A	106A	GOINS	0.94+	4	FEE	A-1
48	112	A	106	HEATH	58.87	1	FEE or EASEMENT	A-1

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
49	112A2	2	1	COASTAL PROPERTIES-EAST INC	8.44	3	FEE or EASEMENT	A-1
50	112A2	2	2	COASTAL PROPERTIES-EAST INC	8.81	3	FEE or EASEMENT	A-1
51	112A2	2	3	COASTAL PROPERTIES-EAST INC	8.85	3	FEE or EASEMENT	A-1
52	112	3	B	LATIMER	14.00	3	FEE or EASEMENT	RV-R
53	112	A	74	MADDOX	3.00	3	FEE or EASEMENT	RV-R
54	112	A	75	MEARS	2.83	3	FEE or EASEMENT	RV-R
55	112	A	94B	KELLAM	9.00	3	FEE or EASEMENT	AFD
56	112	A	94	SMITH	20.00	3	FEE or EASEMENT	RV-R
57	112	A	80	LYNN	12.75	1	FEE or EASEMENT	RV-R
58	112	A	91	HEATH	82.12	1	FEE or EASEMENT	A-1
59	113	A	63	JONES / GOODWYN	16.25	1	FEE or EASEMENT	A-1
60	113	A	61	HEATH	11.77	1	FEE or EASEMENT	A-1
61	113	A	62	HEATH	10.83	1	FEE or EASEMENT	A-1
62	113	A	60	HEATH	99.58	1	FEE or EASEMENT	A-1
63	113	A	49	THE NATURE CONSERVANCY	40.00	1	FEE or EASEMENT	A-1
64	113	A	50	THE NATURE CONSERVANCY	2.00	1	FEE or EASEMENT	RV-R
65	113	A	51	THE NATURE CONSERVANCY	0.75	1	FEE or EASEMENT	RV-R
66	113	A	52	HEATH	100.00	1	FEE or EASEMENT	A-1
67	113	A	59	EUDY	40.00	1	FEE or EASEMENT	A-1
68	112	A	85	ROOKS	6.00	1	FEE or EASEMENT	A-1
69	112	2	2	STILLWELL	5.00	1	FEE or EASEMENT	RV-R
70	112	A	79	AMES	5.00	1	FEE or EASEMENT	A-1
71	112	A	78B	DANIELS	4.00	1	FEE or EASEMENT	A-1
72	112	A	78A	JERNIGAN	4.00	1	FEE or EASEMENT	A-1
73	112	A	32B	HARRISON	4.00	1	FEE or EASEMENT	A-1
74	112	A	26	NOBLE / PARSONS	2.50	1	FEE or EASEMENT	RV-R
75	113	A	58	SCOTT	16.70	3	FEE or EASEMENT	A-1
76	113	A	1	SCOTT	62.97	2	FEE or EASEMENT	A-1
77	113	A	8	HEATH	45.17	3	FEE or EASEMENT	A-1
78	113	A	42	O'CONNER	21.00	2	FEE or EASEMENT	A-1
79	113	A	43	O'CONNER	1.00	2	FEE or EASEMENT	A-1
80	113	A	46	THE NATURE CONSERVANCY	2.01+	2	FEE or EASEMENT	A-1
81	113	A	42A	THE NATURE CONSERVANCY	28.19	2	FEE or EASEMENT	RV-R
82	113	A	48	THE NATURE CONSERVANCY	2.50	2	FEE or EASEMENT	A-1
83	113	A	47	MORRIS	0.12+	4	FEE	A-1
84	113	A	41	O'CONNER	6.00	2	FEE or EASEMENT	A-1
85	113	A	40	WILLIAMS	5.00	2	FEE or EASEMENT	A-1
86	113	A	37	WILDLIFE MANAGEMENT LLC	8.16	2	FEE or EASEMENT	A-1
87	113	A	36	WILDLIFE MANAGEMENT LLC	9.08	3	FEE or EASEMENT	A-1
88	113	A	35	WILDLIFE MANAGEMENT LLC	45.20	2	FEE or EASEMENT	A-1
89	113	A	33	WILDLIFE MANAGEMENT LLC	25.20	2	FEE or EASEMENT	A-1
90	106	A	86A	WILDLIFE MANAGEMENT LLC	26.00	2	FEE or EASEMENT	A-1
91	106	A	86	WILDLIFE MANAGEMENT LLC	10.00	3	FEE or EASEMENT	A-1
92	106	A	87	WILDLIFE MANAGEMENT LLC	23.00	2	FEE or EASEMENT	A-1
93	106	A	89	HAMILTON	13.00	3	FEE or EASEMENT	RV-R
94	106	2	B	SCOTT	12.03	3	FEE or EASEMENT	RV-R
95	106	A	83	WILDLIFE MANAGEMENT LLC	133.70	2	FEE or EASEMENT	A-1

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
96	106	A	71	WILDLIFE MANAGEMENT LLC	66.00	2	FEE or EASEMENT	A-1
97	106	A	68	WILDLIFE MANAGEMENT LLC	1.99	3	FEE or EASEMENT	A-1
98	106	A	67	WILDLIFE MANAGEMENT LLC	5.00	3	FEE or EASEMENT	A-1
99	106	A	66	WILDLIFE MANAGEMENT LLC	52.00	2	FEE or EASEMENT	A-1
100	106	A	69	WILDLIFE MANAGEMENT LLC	150.04	2	FEE or EASEMENT	A-1
101	106	A	70	WILDLIFE MANAGEMENT LLC	12.00	2	FEE or EASEMENT	A-1
102	112	A	62	DICKINSON	56.39	1	FEE or EASEMENT	A-1
103	112	A	63	KELLAM	64.31	3	FEE or EASEMENT	AFD
104	112	A	64	CARLISLE	3.00	3	FEE or EASEMENT	RV-R
105	112	A	39	SPADY	26.96	3	FEE or EASEMENT	RV-R
106	112	A	60	KELLAM	25.00	3	FEE or EASEMENT	AFD
107	112	A	59	AMES	3.00	3	FEE or EASEMENT	A-1
108	112	A	57	AMES	1.00	3	FEE or EASEMENT	A-1
109	112	A	58	ROBINSON	0.66+	3	FEE or EASEMENT	A-1
110	112	A	56	ROBINSON	11.00	3	FEE or EASEMENT	A-1
111	112	A	1	DAVIS	84.29	1	FEE or EASEMENT	AFD
112	105	A	94	MORRIS	250.26	1	FEE or EASEMENT	AFD
113	104	A	15C	GOFFIGON / NOTTINGHAM	1.00	1	FEE or EASEMENT	A-1
114	104	A	14	MORRIS	1.00	1	FEE or EASEMENT	A-1
116	104	A	15B	NOTTINGHAM	12.14	1	FEE or EASEMENT	A-1
117	104	A	15A	PICKETT'S HARBOR LIMITED PARTNERSHIP	22.81	1	FEE or EASEMENT	A-1
118	105	A	95	GOFFIGON / NOTTINGHAM	103.94	1	FEE or EASEMENT	A-1
119	105	A	95A	BRAGG	3.15	4	FEE	A-1
120	105	A	96	MORRIS	5.00	1	FEE or EASEMENT	A-1
121	105	A	97	MORRIS	4.24	1	FEE or EASEMENT	A-1
122	105	A	98	PICOTT	4.24	1	FEE or EASEMENT	A-1
123	105B	1	5	LEWIS	0.33+	3	FEE or EASEMENT	A-1
124	105B	1	4	HARMON	0.20+	3	FEE or EASEMENT	A-1
125	105B	1	3	SESSOMS	0.22+	3	FEE or EASEMENT	A-1
126	105B	1	2	FITCHETT	0.29+	3	FEE or EASEMENT	A-1
127	105B	1	1	FAIRLEY	0.26+	3	FEE or EASEMENT	A-1
128	105	A	99	MOSES	10.08	1	FEE or EASEMENT	A-1
129	105	A	100	YAROS	28.95	1	FEE or EASEMENT	AFD
130	105	A	101	SMITH	1.51	4	FEE	A-1
131	105	A	100A	YAROS	1.00	4	FEE	A-1
132	105	A	102	NOTTINGHAM	50.70	1	FEE or EASEMENT	RV-R
133	105	A	103	MORRIS	14.00	1	FEE or EASEMENT	RV-R
134	104	A	12	DETWILER	123.14	1	FEE or EASEMENT	A-1
135	104	A	12A	NOTTINGHAM	0.81	4	FEE	A-1
136	104	A	15D	GOFFIGON	5.72	1	FEE or EASEMENT	A-1
137	104	A	10	NOTTINGHAM	16.38	1	FEE or EASEMENT	A-1
138	104	A	6B	JOYCE	23.18	1	FEE or EASEMENT	A-1
139	104	A	6A	CAMERON	4.86	1	FEE or EASEMENT	A-1
140	104	A	5	ELLIS	6.75	1	FEE or EASEMENT	A-1
141	104C	1	1	CAPITOL HILL LLC	5.00	3	FEE or EASEMENT	A-1
142	104C	1	2	PACE	5.00	1	FEE or EASEMENT	A-1
143	104C	1	A	STEPHENS / STEIDL	1.43	1	FEE or EASEMENT	A-1

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
144	104C	1	8	CAMERIERI	3.03	1	FEE or EASEMENT	A-1
145	104C	1	7	HENNING	1.84	1	FEE or EASEMENT	A-1
146	104C	1	6	HUBBARD	5.02	1	FEE or EASEMENT	A-1
147	104C	1	5	HUBBARD	5.06	1	FEE or EASEMENT	A-1
148	104C	1	4	VARGAS	5.07	1	FEE or EASEMENT	A-1
149	104C	1	3	MEAKIN	5.07	1	FEE or EASEMENT	A-1
150	104C	1	B	MEAKIN	5.00	3	FEE or EASEMENT	A-1
151	104	A	3E	K DEVELOPMENT CORPORATION	3.00	3	FEE or EASEMENT	A-1
152	104	A	3D	SPOHN	19.54	1	FEE or EASEMENT	A-1
153	104	A	3F	COLLIER	13.58	1	FEE or EASEMENT	A-1
154	104	A	13	WORRELL	3.00	4	FEE	RV-R
155	104	A	3A	GENERAL FARMS & LAND COMPANY	62.88	1	FEE or EASEMENT	A-1
156	104	A	3	GENERAL FARMS & LAND COMPANY	49.00	1	FEE or EASEMENT	A-1
157	104	A	4A	PRETTYMAN	5.00	1	FEE or EASEMENT	A-1
158	104	A	4	MANUEL	40.75	1	FEE or EASEMENT	A-1
159	104	A	3C	DELSIGNORE	2.00	4	FEE	A-1
160	104	A	3B	MANUEL FAMILY LIMITED PARTNERSHIP	2.50	3	FEE or EASEMENT	A-1
161	104	A	6	WAGNER	91.92	1	FEE or EASEMENT	A-1
162	104	A	2	DICKINSON	336.00	1	FEE or EASEMENT	A-1
163	105	A	1	GENERAL FARMS & LAND COMPANY	9.00	3	FEE or EASEMENT	RV-R
164	105	A	2	INGRAM	1.00	4	FEE	RV-R
165	97	A	8	DIXON	142.00	1	FEE or EASEMENT	A-1
166	98	A	56	CURLING	86.43	1	FEE or EASEMENT	A-1
167	98	A	59A	CURLING	38.00	1	FEE or EASEMENT	A-1
168	97	A	4A	PARSONS	85.00	1	FEE or EASEMENT	A-1
169	97	A	4	PARSONS	65.00	1	FEE or EASEMENT	A-1
170	97	A	10A	KABLER IRREVOCABLE TRUST II	15.50	1	FEE or EASEMENT	A-1
171	97	A	9	HAND	171.31+	1	FEE or EASEMENT	A-1
172	97	A	10	VANN	29.50	1	FEE or EASEMENT	A-1
173	117	2	F	LATIMER	17.01+	1	FEE or EASEMENT	A-1
174	117	2	F	LATIMER	5.47+	1	FEE or EASEMENT	A-1
175	117	A	7	LATIMER	1.18+	1	FEE or EASEMENT	A-1
176	117	2	F	LATIMER	2.26+	1	FEE or EASEMENT	A-1
177	117	1	A	LATIMER	7.07	1	FEE or EASEMENT	A-1
178	117	1	D1	LATIMER	11.09	1	FEE or EASEMENT	A-1
179	117	1	G	LATIMER	1.25	1	FEE or EASEMENT	A-1
180	117	1	F	LATIMER	1.25	1	FEE or EASEMENT	A-1
181	117	1	E	LATIMER	1.25	1	FEE or EASEMENT	A-1
182	117	1	A	LATIMER	7.07	3	FEE or EASEMENT	A-1
183	112	4	C1	HEATH	26.00	1	FEE or EASEMENT	A-1
184	112	4	C3	HEATH	17.61	1	FEE or EASEMENT	A-1
185	112	3	A	LATIMER	8.56	3	FEE or EASEMENT	RV-R
186	104	A	6C	WAYMAN	1.00	3	FEE or EASEMENT	A-1
187	97	2	1	HAND	8.54+	1	FEE or EASEMENT	A-1
188	97	2	2	HAND	7.93+	1	FEE or EASEMENT	A-1
189	97	2	3	HORNbacher / FILLION	5.81+	1	FEE or EASEMENT	A-1

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
190				VDCR KIPTOPEKE STATE PARK	[535]	1	COOPERATIVE AGREEMENT	C
191				VDGIF STATE WMA - GATR TRACT	[356]	1	COOPERATIVE AGREEMENT	C
192				VDCR/HERITAGE TROWER NATURAL AREA	[35]	1	COOPERATIVE AGREEMENT	C
Notes: 1) numbers 18, 38, and 115 have not been used.								
2) the information in this table is provided courtesy of Northampton County, from the GIS tax database.....please be aware that it is still in the quality control stage of proof-reading/editing.								
3) acres column displays deeded acreage from county tax database, except where not available .....acreage marked " + " are estimated measurements from GIS map layer.								
4) Kiptopeke State Park, the GATR Tract WMA, and the Trower Natural Area are not part of the 6,030-acre expansion area.								
Date: May 18,	2004							

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
49	112A2	2	1	COASTAL PROPERTIES-EAST INC	8.44	3	FEE or EASEMENT	A-1
50	112A2	2	2	COASTAL PROPERTIES-EAST INC	8.81	3	FEE or EASEMENT	A-1
51	112A2	2	3	COASTAL PROPERTIES-EAST INC	8.85	3	FEE or EASEMENT	A-1
52	112	3	B	LATIMER	14.00	3	FEE or EASEMENT	RV-R
53	112	A	74	MADDOX	3.00	3	FEE or EASEMENT	RV-R
54	112	A	75	MEARS	2.83	3	FEE or EASEMENT	RV-R
55	112	A	94B	KELLAM	9.00	3	FEE or EASEMENT	AFD
56	112	A	94	SMITH	20.00	3	FEE or EASEMENT	RV-R
57	112	A	80	LYNN	12.75	1	FEE or EASEMENT	RV-R
58	112	A	91	HEATH	82.12	1	FEE or EASEMENT	A-1
59	113	A	63	JONES / GOODWYN	16.25	1	FEE or EASEMENT	A-1
60	113	A	61	HEATH	11.77	1	FEE or EASEMENT	A-1
61	113	A	62	HEATH	10.83	1	FEE or EASEMENT	A-1
62	113	A	60	HEATH	99.58	1	FEE or EASEMENT	A-1
63	113	A	49	THE NATURE CONSERVANCY	40.00	1	FEE or EASEMENT	A-1
64	113	A	50	THE NATURE CONSERVANCY	2.00	1	FEE or EASEMENT	RV-R
65	113	A	51	THE NATURE CONSERVANCY	0.75	1	FEE or EASEMENT	RV-R
66	113	A	52	HEATH	100.00	1	FEE or EASEMENT	A-1
67	113	A	59	EUDY	40.00	1	FEE or EASEMENT	A-1
68	112	A	85	ROOKS	6.00	1	FEE or EASEMENT	A-1
69	112	2	2	STILLWELL	5.00	1	FEE or EASEMENT	RV-R
70	112	A	79	AMES	5.00	1	FEE or EASEMENT	A-1
71	112	A	78B	DANIELS	4.00	1	FEE or EASEMENT	A-1
72	112	A	78A	JERNIGAN	4.00	1	FEE or EASEMENT	A-1
73	112	A	32B	HARRISON	4.00	1	FEE or EASEMENT	A-1
74	112	A	26	NOBLE / PARSONS	2.50	1	FEE or EASEMENT	RV-R
75	113	A	58	SCOTT	16.70	3	FEE or EASEMENT	A-1
76	113	A	1	SCOTT	62.97	2	FEE or EASEMENT	A-1
77	113	A	8	HEATH	45.17	3	FEE or EASEMENT	A-1
78	113	A	42	O'CONNER	21.00	2	FEE or EASEMENT	A-1
79	113	A	43	O'CONNER	1.00	2	FEE or EASEMENT	A-1
80	113	A	46	THE NATURE CONSERVANCY	2.01+	2	FEE or EASEMENT	A-1
81	113	A	42A	THE NATURE CONSERVANCY	28.19	2	FEE or EASEMENT	RV-R
82	113	A	48	THE NATURE CONSERVANCY	2.50	2	FEE or EASEMENT	A-1
83	113	A	47	MORRIS	0.12+	4	FEE	A-1
84	113	A	41	O'CONNER	6.00	2	FEE or EASEMENT	A-1
85	113	A	40	WILLIAMS	5.00	2	FEE or EASEMENT	A-1
86	113	A	37	WILDLIFE MANAGEMENT LLC	8.16	2	FEE or EASEMENT	A-1
87	113	A	36	WILDLIFE MANAGEMENT LLC	9.08	3	FEE or EASEMENT	A-1
88	113	A	35	WILDLIFE MANAGEMENT LLC	45.20	2	FEE or EASEMENT	A-1
89	113	A	33	WILDLIFE MANAGEMENT LLC	25.20	2	FEE or EASEMENT	A-1
90	106	A	86A	WILDLIFE MANAGEMENT LLC	26.00	2	FEE or EASEMENT	A-1
91	106	A	86	WILDLIFE MANAGEMENT LLC	10.00	3	FEE or EASEMENT	A-1
92	106	A	87	WILDLIFE MANAGEMENT LLC	23.00	2	FEE or EASEMENT	A-1
93	106	A	89	HAMILTON	13.00	3	FEE or EASEMENT	RV-R
94	106	2	B	SCOTT	12.03	3	FEE or EASEMENT	RV-R
95	106	A	83	WILDLIFE MANAGEMENT LLC	133.70	2	FEE or EASEMENT	A-1



LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
96	106	A	71	WILDLIFE MANAGEMENT LLC	66.00	2	FEE or EASEMENT	A-1
97	106	A	68	WILDLIFE MANAGEMENT LLC	1.99	3	FEE or EASEMENT	A-1
98	106	A	67	WILDLIFE MANAGEMENT LLC	5.00	3	FEE or EASEMENT	A-1
99	106	A	66	WILDLIFE MANAGEMENT LLC	52.00	2	FEE or EASEMENT	A-1
100	106	A	69	WILDLIFE MANAGEMENT LLC	150.04	2	FEE or EASEMENT	A-1
101	106	A	70	WILDLIFE MANAGEMENT LLC	12.00	2	FEE or EASEMENT	A-1
102	112	A	62	DICKINSON	56.39	1	FEE or EASEMENT	A-1
103	112	A	63	KELLAM	64.31	3	FEE or EASEMENT	AFD
104	112	A	64	CARLISLE	3.00	3	FEE or EASEMENT	RV-R
105	112	A	39	SPADY	26.96	3	FEE or EASEMENT	RV-R
106	112	A	60	KELLAM	25.00	3	FEE or EASEMENT	AFD
107	112	A	59	AMES	3.00	3	FEE or EASEMENT	A-1
108	112	A	57	AMES	1.00	3	FEE or EASEMENT	A-1
109	112	A	58	ROBINSON	0.66+	3	FEE or EASEMENT	A-1
110	112	A	56	ROBINSON	11.00	3	FEE or EASEMENT	A-1
111	112	A	1	DAVIS	84.29	1	FEE or EASEMENT	AFD
112	105	A	94	MORRIS	250.26	1	FEE or EASEMENT	AFD
113	104	A	15C	GOFFIGON / NOTTINGHAM	1.00	1	FEE or EASEMENT	A-1
114	104	A	14	MORRIS	1.00	1	FEE or EASEMENT	A-1
116	104	A	15B	NOTTINGHAM	12.14	1	FEE or EASEMENT	A-1
117	104	A	15A	PICKETT'S HARBOR LIMITED PARTNERSHIP	22.81	1	FEE or EASEMENT	A-1
118	105	A	95	GOFFIGON / NOTTINGHAM	103.94	1	FEE or EASEMENT	A-1
119	105	A	95A	BRAGG	3.15	4	FEE	A-1
120	105	A	96	MORRIS	5.00	1	FEE or EASEMENT	A-1
121	105	A	97	MORRIS	4.24	1	FEE or EASEMENT	A-1
122	105	A	98	PICOTT	4.24	1	FEE or EASEMENT	A-1
123	105B	1	5	LEWIS	0.33+	3	FEE or EASEMENT	A-1
124	105B	1	4	HARMON	0.20+	3	FEE or EASEMENT	A-1
125	105B	1	3	SESSOMS	0.22+	3	FEE or EASEMENT	A-1
126	105B	1	2	FITCHETT	0.29+	3	FEE or EASEMENT	A-1
127	105B	1	1	FAIRLEY	0.26+	3	FEE or EASEMENT	A-1
128	105	A	99	MOSES	10.08	1	FEE or EASEMENT	A-1
129	105	A	100	YAROS	28.95	1	FEE or EASEMENT	AFD
130	105	A	101	SMITH	1.51	4	FEE	A-1
131	105	A	100A	YAROS	1.00	4	FEE	A-1
132	105	A	102	NOTTINGHAM	50.70	1	FEE or EASEMENT	RV-R
133	105	A	103	MORRIS	14.00	1	FEE or EASEMENT	RV-R
134	104	A	12	DETWILER	123.14	1	FEE or EASEMENT	A-1
135	104	A	12A	NOTTINGHAM	0.81	4	FEE	A-1
136	104	A	15D	GOFFIGON	5.72	1	FEE or EASEMENT	A-1
137	104	A	10	NOTTINGHAM	16.38	1	FEE or EASEMENT	A-1
138	104	A	6B	JOYCE	23.18	1	FEE or EASEMENT	A-1
139	104	A	6A	CAMERON	4.86	1	FEE or EASEMENT	A-1
140	104	A	5	ELLIS	6.75	1	FEE or EASEMENT	A-1
141	104C	1	1	CAPITOL HILL LLC	5.00	3	FEE or EASEMENT	A-1
142	104C	1	2	PACE	5.00	1	FEE or EASEMENT	A-1
143	104C	1	A	STEPHENS / STEIDL	1.43	1	FEE or EASEMENT	A-1

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
144	104C	1	8	CAMERIERI	3.03	1	FEE or EASEMENT	A-1
145	104C	1	7	HENNING	1.84	1	FEE or EASEMENT	A-1
146	104C	1	6	HUBBARD	5.02	1	FEE or EASEMENT	A-1
147	104C	1	5	HUBBARD	5.06	1	FEE or EASEMENT	A-1
148	104C	1	4	VARGAS	5.07	1	FEE or EASEMENT	A-1
149	104C	1	3	MEAKIN	5.07	1	FEE or EASEMENT	A-1
150	104C	1	B	MEAKIN	5.00	3	FEE or EASEMENT	A-1
151	104	A	3E	K DEVELOPMENT CORPORATION	3.00	3	FEE or EASEMENT	A-1
152	104	A	3D	SPOHN	19.54	1	FEE or EASEMENT	A-1
153	104	A	3F	COLLIER	13.58	1	FEE or EASEMENT	A-1
154	104	A	13	WORRELL	3.00	4	FEE	RV-R
155	104	A	3A	GENERAL FARMS & LAND COMPANY	62.88	1	FEE or EASEMENT	A-1
156	104	A	3	GENERAL FARMS & LAND COMPANY	49.00	1	FEE or EASEMENT	A-1
157	104	A	4A	PRETTYMAN	5.00	1	FEE or EASEMENT	A-1
158	104	A	4	MANUEL	40.75	1	FEE or EASEMENT	A-1
159	104	A	3C	DELSIGNORE	2.00	4	FEE	A-1
160	104	A	3B	MANUEL FAMILY LIMITED PARTNERSHIP	2.50	3	FEE or EASEMENT	A-1
161	104	A	6	WAGNER	91.92	1	FEE or EASEMENT	A-1
162	104	A	2	DICKINSON	336.00	1	FEE or EASEMENT	A-1
163	105	A	1	GENERAL FARMS & LAND COMPANY	9.00	3	FEE or EASEMENT	RV-R
164	105	A	2	INGRAM	1.00	4	FEE	RV-R
165	97	A	8	DIXON	142.00	1	FEE or EASEMENT	A-1
166	98	A	56	CURLING	86.43	1	FEE or EASEMENT	A-1
167	98	A	59A	CURLING	38.00	1	FEE or EASEMENT	A-1
168	97	A	4A	PARSONS	85.00	1	FEE or EASEMENT	A-1
169	97	A	4	PARSONS	65.00	1	FEE or EASEMENT	A-1
170	97	A	10A	KABLER IRREVOCABLE TRUST II	15.50	1	FEE or EASEMENT	A-1
171	97	A	9	HAND	171.31+	1	FEE or EASEMENT	A-1
172	97	A	10	VANN	29.50	1	FEE or EASEMENT	A-1
173	117	2	F	LATIMER	17.01+	1	FEE or EASEMENT	A-1
174	117	2	F	LATIMER	5.47+	1	FEE or EASEMENT	A-1
175	117	A	7	LATIMER	1.18+	1	FEE or EASEMENT	A-1
176	117	2	F	LATIMER	2.26+	1	FEE or EASEMENT	A-1
177	117	1	A	LATIMER	7.07	1	FEE or EASEMENT	A-1
178	117	1	D1	LATIMER	11.09	1	FEE or EASEMENT	A-1
179	117	1	G	LATIMER	1.25	1	FEE or EASEMENT	A-1
180	117	1	F	LATIMER	1.25	1	FEE or EASEMENT	A-1
181	117	1	E	LATIMER	1.25	1	FEE or EASEMENT	A-1
182	117	1	A	LATIMER	7.07	3	FEE or EASEMENT	A-1
183	112	4	C1	HEATH	26.00	1	FEE or EASEMENT	A-1
184	112	4	C3	HEATH	17.61	1	FEE or EASEMENT	A-1
185	112	3	A	LATIMER	8.56	3	FEE or EASEMENT	RV-R
186	104	A	6C	WAYMAN	1.00	3	FEE or EASEMENT	A-1
187	97	2	1	HAND	8.54+	1	FEE or EASEMENT	A-1
188	97	2	2	HAND	7.93+	1	FEE or EASEMENT	A-1
189	97	2	3	HORNbacher / FILLION	5.81+	1	FEE or EASEMENT	A-1

LPP NO.	TAX MAP	SECTION	LOT	LASTNAME	DEEDED ACRES	PRIORITY	METHOD	ZONING
190				VDCR KIPTOPEKE STATE PARK	[535]	1	COOPERATIVE AGREEMENT	C
191				VDGIF STATE WMA - GATR TRACT	[356]	1	COOPERATIVE AGREEMENT	C
192				VDCR/HERITAGE TROWER NATURAL AREA	[35]	1	COOPERATIVE AGREEMENT	C
Notes: 1) numbers 18, 38, and 115 have not been used.								
2) the information in this table is provided courtesy of Northampton County, from the GIS tax database.....please be aware that it is still in the quality control stage of proof-reading/editing.								
3) acres column displays deeded acreage from county tax database, except where not available .....acreage marked " + " are estimated measurements from GIS map layer.								
4) Kiptopeke State Park, the GATR Tract WMA, and the Trower Natural Area are not part of the 6,030-acre expansion area.								
Date: May 18,	2004							

# Eastern Shore of Virginia National Wildlife Refuge

## *Land Protection Plan*

### Index Map

Northampton County, Virginia



#### Data Sources:

Digital Tax Map data produced and provided by Northampton County, VA.  
All other data provided by U.S. Fish & Wildlife Service.

#### Projection/Datum:

UTM Zone 18, NAD83, Meters.

Map prepared by the R5 Cartography & Spatial Data Services Section.

April 2004

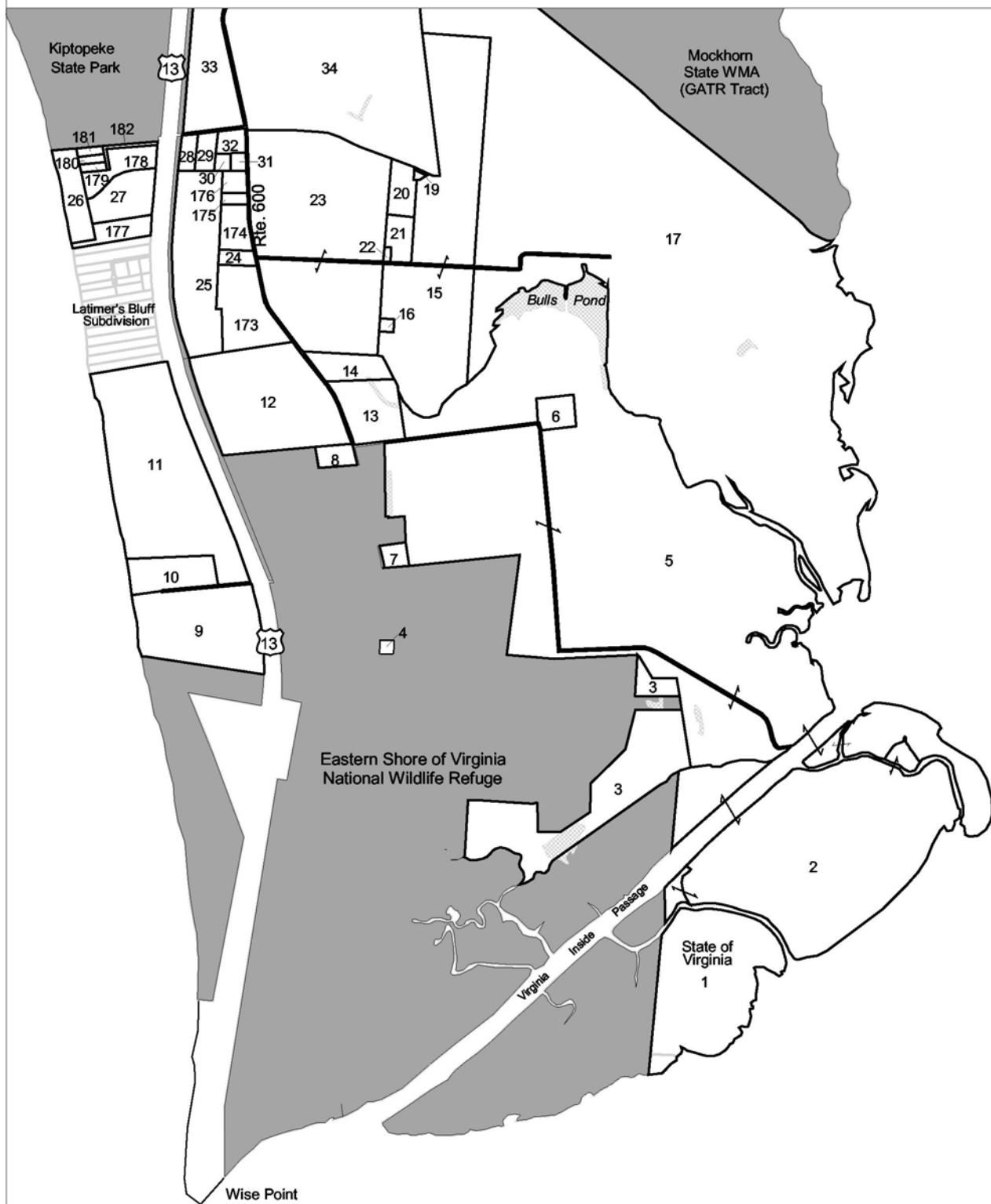
This map is for planning purposes only.



# Eastern Shore of Virginia National Wildlife Refuge

## Land Protection Plan

Northampton County, Virginia



### Data Sources:

Digital Tax Map data produced and provided by Northampton County, VA (2/2004 update). All other data provided by U.S. Fish & Wildlife Service.

Projection/Datum:  
UTM Zone 18, NAD83, Meters.

Map prepared by the R5 Cartography & Spatial Data Services Section.

April 2004

This map is for planning purposes only.

0 1000 2000 3000 4000 Feet

0 300 600 900 1200 Meters



# Eastern Shore of Virginia National Wildlife Refuge

## Land Protection Plan

Northampton County, Virginia



### Data Sources:

Digital Tax Map data produced and provided by Northampton County, VA (2/2004 update). All other data provided by U.S. Fish & Wildlife Service.

Projection/Datum:  
UTM Zone 18, NAD83, Meters.  
Map prepared by the R5 Cartography & Spatial Data Services Section.  
April 2004

This map is for planning purposes only.

0 1000 2000 3000 4000 Feet



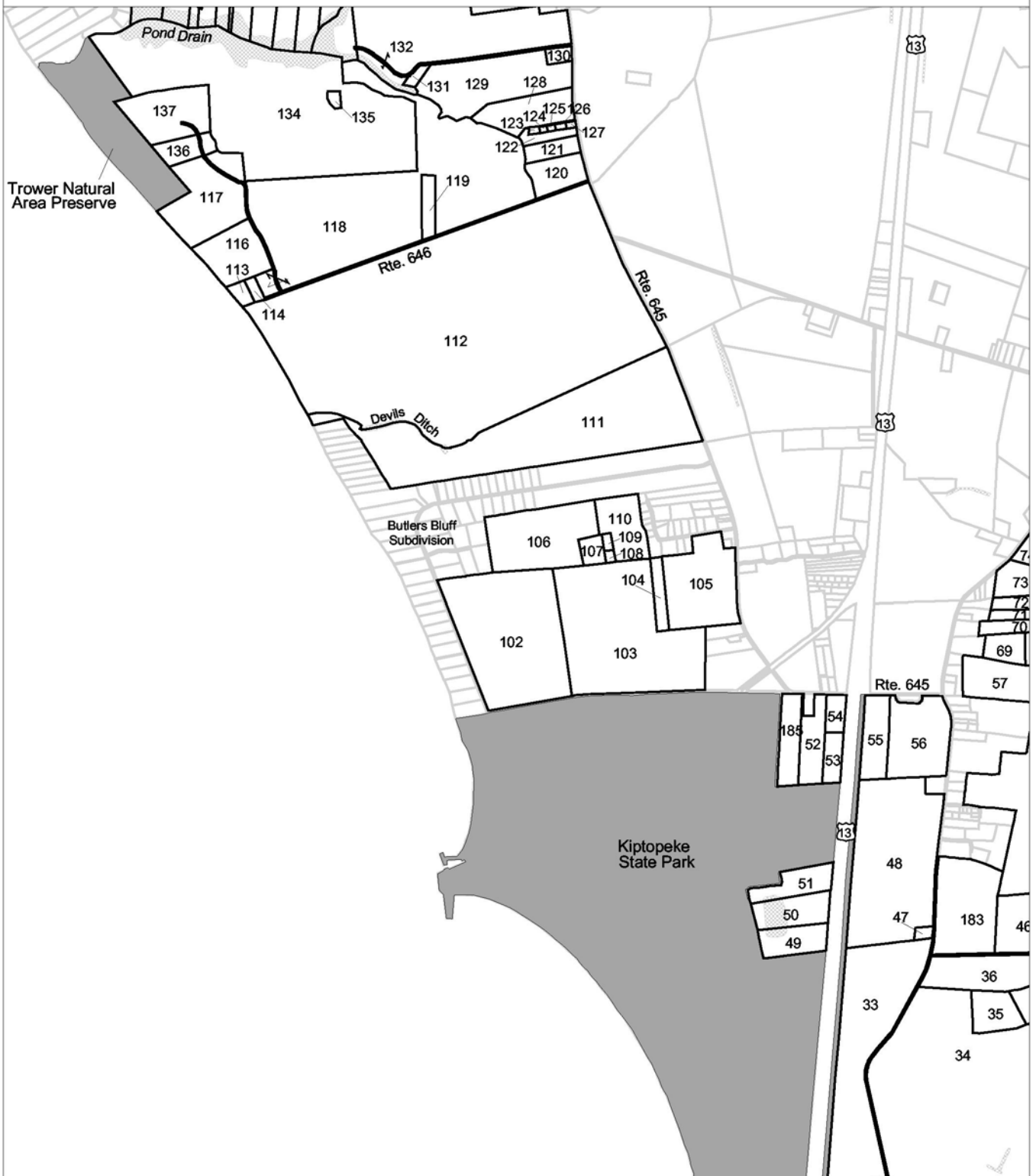
0 300 600 900 1200 Meters



# Eastern Shore of Virginia National Wildlife Refuge

## *Land Protection Plan*

Northampton County, Virginia



### Data Sources:

Digital Tax Map data produced and provided by Northampton County, VA (2/2004). All other data provided by U.S. Fish & Wildlife Service.

Projection/Datum:  
UTM Zone 18, NAD83, Meters.

Map prepared by the R5 Cartography & Spatial Data Services Section.  
April 2004

This map is for planning purposes only.

0 1000 2000 3000 4000 Feet

0 300 600 900 1200 Meters

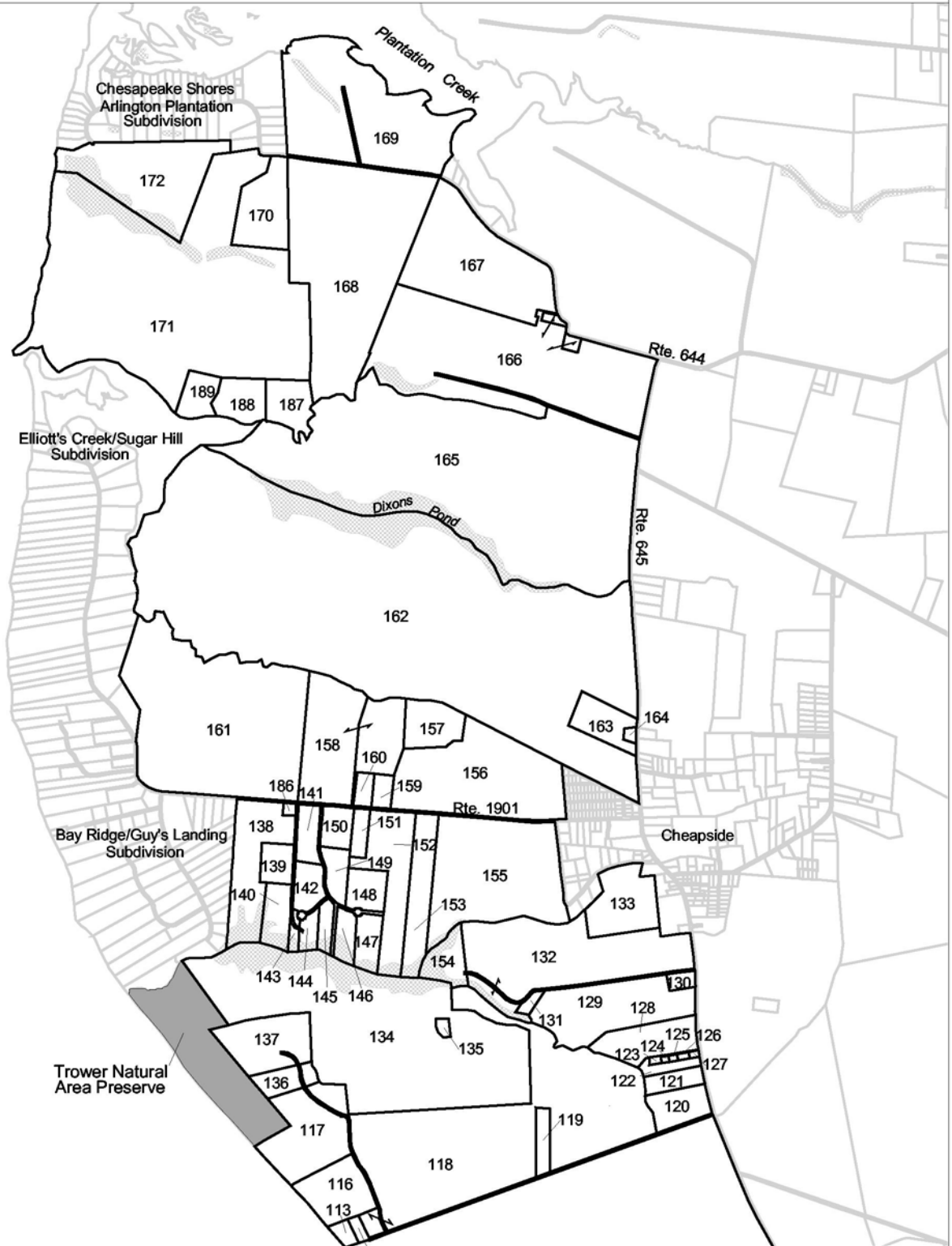




# Eastern Shore of Virginia National Wildlife Refuge

## *Land Protection Plan*

Northampton County, Virginia



### Data Sources:

Digital Tax Map data produced and provided by Northampton County, VA (2/2004). All other data provided by U.S. Fish & Wildlife Service.

### Projection/Datum:

UTM Zone 18, NAD83, Meters.  
Map prepared by the R5 Cartography & Spatial Data Services Section.  
April 2004

This map is for planning purposes only.

0 1000 2000 3000 4000 Feet



0 300 600 900 1200 Meters



## **Appendix F**

### **Refuge Operations Needs System (RONS) and Maintenance Management System (MMS) Project Lists**

**Terms used in this appendix:**

**Project:** This list includes proposed projects expected to cost more than \$20,000. Table F-1 includes those projects currently in the RONS database. Tables F-2 and F-3 include those projects proposed in the CCP Alternatives.

**Project Number:** This is the number used to identify the project in Regional database system.

**Tier:** Tier 1 projects are given priority over Tier 2 projects.

**Regional Ranking:** This number indicates the project's rank in relation to all other similar refuge projects in Region 5.

**Refuge Rank:** This number indicates the project's rank in relation to all other projects on the Refuge. The number "999" indicates the Refuge has not ranked the project.

**FTE:** Full Time Staffing Equivalent. One FTE equals one person working full time for one whole year.

**First Year Cost:** Estimated costs incurred during the first year of a project - typically higher than recurring costs, due to construction, equipment purchased, or other start-up expenses.

**Recurring Cost:** Estimated average annual project cost for subsequent years; includes recurring salary and maintenance costs.

**Table F-1:** Proposed projects currently in the RONS database (FY2003).

Project Description	Tier	Refuge Rank	Regional Rank	FTEs	First Year Cost (\$1,000)	Recurring Cost (\$1,000)	Project Duration (yrs.)
Inventory resources and apply adaptive management techniques (bio/biotech)	1	999	16	1	\$128	\$63	15
Protect resources and ensure public safety (Law enforcement officer)	1	999	20	1	\$129	\$64	15
Improve maintenance of refuge infrastructure and equipment (Main/Equip Op)	1	999	34	1	\$122	\$57	15
Monitor biological resources on Fisherman Island Refuge	1	1	28	1	\$139	\$74	15
Initiate inventorying and monitoring of biological resources on ESV	2	2	65	0	\$174	\$34	15
Control nonnative plant species on ESV	1	3	223	0	\$36	\$12	15
Protect visitor safety and refuge resources	1	4	198	1	\$117	\$52	15
Enhance environmental education programs	1	5	327	0	\$102	\$6	15
Design, implement, and maintain a geographical information system (GIS) database	2	6	359	0	\$29	\$5	15
Expand public tours of FSH	1	7	285	.5	\$55	\$22	15
Study predation on colonial nesting birds on FSH	1	8	134	0	\$57	\$16	3
Create 50 acres of shrub and 50 acres of hardwood habitat on ESVNWR	2	9	385	0	\$65	\$2	5
Restore 120 acres of grassland on ESVNWR	2	11	414	0	\$54	\$4	8
Develop new visitor center exhibits including a diorama and video segment	2	10	999	0	\$116	\$3	2
Construct a 3-mile bike trail to Kiptopeke State Park	1	12	600	0	\$44	\$6	2
Construct 2 vehicle pull-offs for habitat management interpretation	1	13	600	0	\$32	0	1
Conduct deer surveys and habitat impact analysis on FSH NWR	2	14	999	0	\$122	\$37	3
Construct a boat ramp for fishing opportunity if the Service acquires the Wise Point Corporation property	1	15	999	0	\$629	\$78	15

Tables F-2 and F-3 do not include a project number, Tier, Refuge rank or Regional Rank because they are proposed RONS projects. They are not in the current RONS system, and therefore have not been assigned a project number and have not been ranked.

**Table F-2:** Additional biological projects proposed for Alternative B, none of which are currently identified in the RONS database.

Project Description	FTEs	First Year Cost (\$1,000)	Recurring Cost (\$1,000)	Project Duration
Contract a forester to develop appropriate hardwood and pine forest management techniques, also to include understory, shrub, grassland, and invasive species management recommendations.	0	\$20	0	1 yr
Hire 2 seasonal biological technicians to monitor; (1) invasive species response to control methods, (2) shrub fruit production, and (3) deer exclosure and control plots. These people would also assist in invasive species control on approx. 175 impacted acres.	2 Temp/ Seasonal	\$30	\$24	15 yrs
Fencing for deer exclosures (1,260 meters), herbicide for treatment of approx. 175 acres of invasive species, and contract Animal Damage Control to remove feral cats on the ESVNWR.	0	\$25 total \$14 - pred. Contract \$8 - fencing \$3 - herbicide	\$3 - herbicides	8 yrs
Hire 1 seasonal maintenance worker to apply multiple applications of herbicide to approximately 175 impacted acres, assist in removal of 15 acres of pine, and assist in planting 31 acres of hardwood. Hire a seasonal biological technician to assist in bird, mammal, reptile, and amphibian surveys on ESV and FI NWRs, and to assist in tiger beetle surveys on refuge's southern tip beach.	.5 .5	\$12.5 \$15 \$27.5 total	\$12.5 \$12	15 yrs
Contract a vegetation survey on FINWR. Contract an invertebrate survey for FI and ESVNWR. Contract a tiger beetle larval survey on refuge's southern tip beach and Fisherman Island (2 days/season for 3 years).	0	\$5 \$30 \$1 \$36 total	\$1 for beetle study (total of 3 yrs)	3 yrs
Burn test plots of invasive species to determine the effectiveness of using fire management for eradicating invasives*.	0	\$45	\$20	3 yrs

\* This project would not be included in the RONS database. Instead, they would be funded through a separate pool of money that is set aside for fire management.

**Table F-3:** Additional public use projects proposed for Alternative B, none of which are currently identified in the RONS database.

Project Description	Staff	Yr.1 cost x 1k	Recurring x 1k	Project Dur.
Hire a Recreational Assistant to help develop 9 interpretive displays for trail kiosks, develop table top exhibits for outreach, update 3 interpretive signs; develop 11 new environmental lesson plans, annual teacher's workshops, photography workshops, and a series of monthly educational programs.	1.0	GS-5 Rec. Assistant \$40  \$10 for exhibits	\$34	15 yrs
Develop and produce an additional management video segment describing hardwood and understory management techniques, also install a closed circuit color TV system in the VC for the active osprey nest platform. Construct a new Diorama (Rewrite existing RONS # 93111.	0	(this would be a revision to an existing RONS project) Osprey cam-\$ 2	0	3 yrs
Hire one seasonal Recreational Assistant to staff the Visitor Center, help coordinate the volunteer program, and assist in starting a refuge "Friends" group.	1.0	GS-5 Rec. Assistant  \$40	\$34	15 yrs
Hire a Realty Specialist to coordinate acquisition and easement efforts on the lower Delmarva Peninsula between the Service and partners.	1.0	GS-9/11 Realty Specialist - \$55	\$58	15 yrs
Hire a full-time Maintenance Worker to maintain landscaping around VC, construction of two butterfly gardens and 2 demonstration plots and 1-3 private home gardens emphasizing landscaping practices for neotropical migrants, work with local nurseries to stock native plants, construct a refuge greenhouse, construct and maintain 3-mile bike trail.	.5	WG-4  Maintenance Worker  \$15	\$12.5	15 yrs
Contract a study to assess the socio-economic benefits of the refuge to the county.	0	\$50	0	2yrs
Construct a boardwalk, deck, two interpretive panels, trailhead sign, and gate as part new Wise Point trail.	0	\$22		1yr

**Table F-4.** Refuge Maintenance Management System.

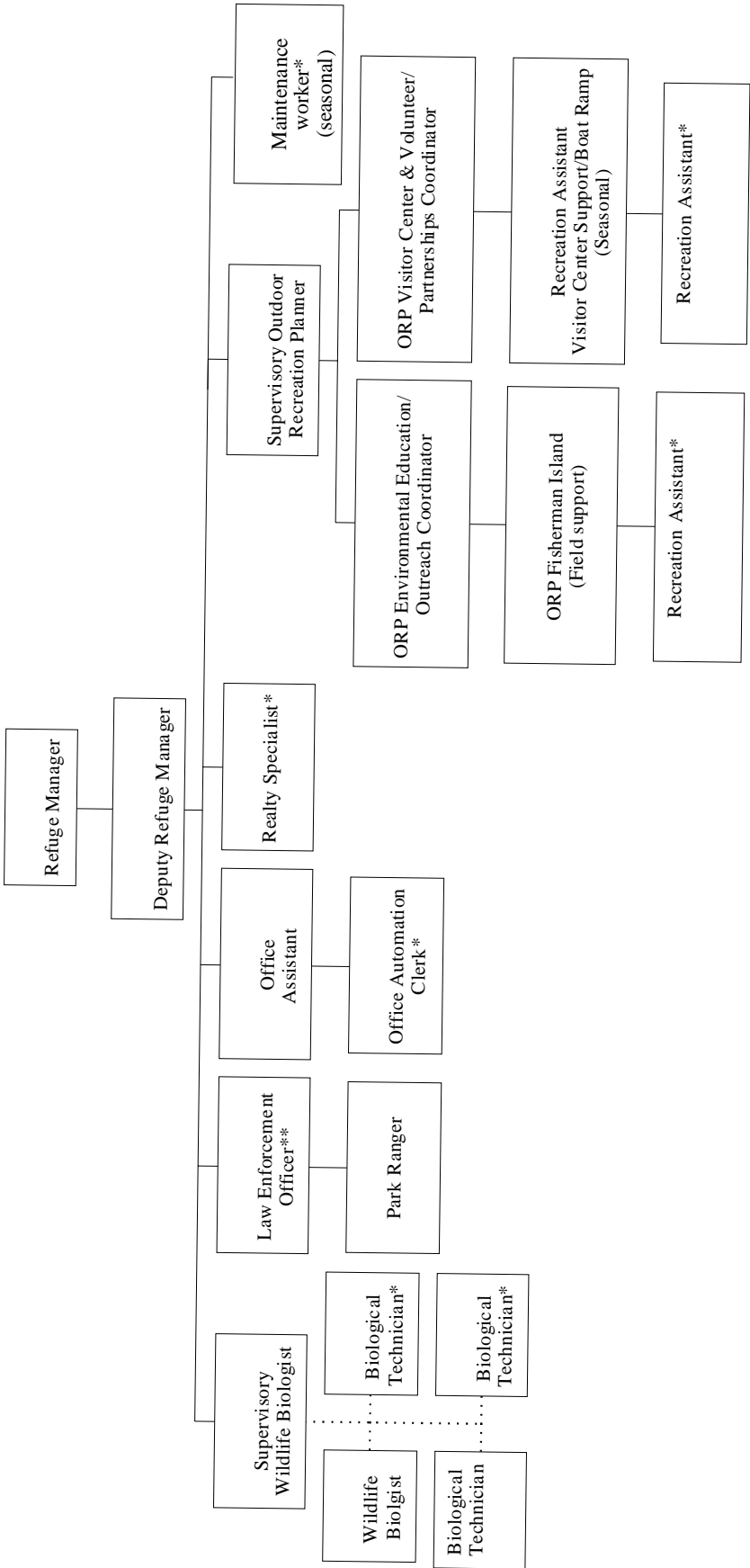
Project #	Project Name	Refuge Rank	Regional Rank	Cost Estimate (\$1,000)
00001	Replace 1988 Dodge pick-up	1	1	\$19
97001	Repair leaking Visitor Center roof	2	9	\$64
97003	Repair heating system in residence and motor pool	3	87	\$25
00003	Regrade Environmental Education trail and build boardwalk	4	91	\$42
93016	Phase I: Chip or resurface and seal coat 1.75 miles of Refuge roads	6	53	\$500
01006	Replace 1989 Chevy pickup	7	93	\$19
00008	Replace existing low band communication system	8	36	\$82
99001	Replace 1992 Ford Tempo	9	65	\$18
98507	Replace Visitor Center exhibits	10	193	\$124
99004	Replace residence windows and vinyl siding	11	999	\$43
00007	Replace 1977 International Truck and Lowboy Trailer	12	999	\$207
01005	Replace 1994 Ford Taurus	13	267	\$19
93016	Phase II: Chip or resurface and seal coat 1.75 miles of Refuge roads	14	500	\$500
01003	Remove old military towers on FSH NWR	14	999	\$10
01002	Remove old water plant and four well houses on ESV NWR	15	999	\$36
01001	Remove communication building at GATR tract of the ESV NWR	16	999	\$67
01004	Remove generator and pump house at the GATR tract of the ESV NWR	17	999	\$31
93035	Replace 1975 farm tractor	18	500	\$49
93113	Replace hot water heating unit in motor pool	99	999	\$11
00004	Seal coat Visitor Center entrance road and parking lots	99	999	\$8
02001	Repair Wise Point Road and boat ramp	999	999	\$300



## **Appendix G**

### **Staffing Chart**

# Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges Staffing Chart



\* New position proposed in CCP  
 \*\*Upgraded position proposed in CCP

# Appendix H

## List of Preparers

**Members of the core planning team:**

**Robert Adamcik**

Wildlife Biologist  
USFWS Washington Office

Provided input as consultant on biological elements of the plan, with emphasis on development of Alternative D. Also, provided input on goals, objectives and strategies.

**Liz Bellantoni**

National Planning Coordinator  
USFWS Washington Office

Provided input regarding the formulation of goals, objectives and strategies. Also, provided guidance in interpreting the planning policy.

**James Kenyon**

Former Outdoor Recreation Planner (retired)  
Eastern Shore of Virginia National Wildlife Refuge

Major responsibilities included developing strategies for priority public uses. Also, helped draft compatibility determinations for the various activities on the refuges.

**Pamela Denmon**

Wildlife Biologist  
Eastern Shore of Virginia National Wildlife Refuge

Provided biological assistance for Alternatives and Environmental Consequences chapters.

**Beth Goldstein**

Team Leader  
USFWS, Region 5 Regional Office

Organized and facilitated meetings, coordinated all tasks related to the CCP and wrote sections of the plan.

**Nancy McGarigal**  
Refuge Planner  
USFWS, Region 5 Regional Office

Coordinated Final CPP.

**Michael Mitchell**  
Former Assistant Refuge Manager  
Eastern Shore of Virginia National Wildlife Refuge

Primary author of Chapter 3, “Biological Resources” section.

**Susan Rice**  
Project Leader  
Eastern Shore of Virginia National Wildlife Refuge

Assisted with gathering baseline data and expert biological input to formulate alternatives. Assisted with formulation of goals, objectives and strategies. Drafted compatibility determinations responded to public comments. Assisted with drafting the LPP.

**Don Schwab**  
Wildlife Biologist  
VA Department of Game and Inland Fisheries

Provided input on mammals, predator issues and deer management strategies for both refuges.

**Phil West**  
Game Biologist  
VA Department of Game and Inland Fisheries

Provided input on deer hunting and habitat management strategies from a State perspective.

**William Zinni**  
Land Ascertainment Biologist  
USFWS, Region 5 Regional Office

The primary author of the Land Protection Plan (LPP). Also, participated in meetings related to goals and objectives and helped write the land protection strategies and the biological section of the plan.

**Other Assistance:**

**William Archambault**

Former NEPA Coordinator  
USFWS, Region 5 Regional Office

Provided guidance on public use issues and NEPA compliance.  
Facilitated public meetings.

**Nancy Biegel**

Former Outdoor Recreation Planner  
Eastern Shore of Virginia National Wildlife Refuge

Provided access to photographs used in the CCP. Also, provided input on public use strategies.

**Thomas Bonetti**

Refuge Planner  
USFWS, Region 5 Regional Office

Served as team leader for the first year-and-a-half of the planning process.

**Robert Carpenter**

Former Engineering Equipment Operator (retired)  
Eastern Shore of Virginia National Wildlife Refuge

Provided information on maintenance needs of the refuge and on traditional land uses on the Eastern Shore of Virginia.

**Gary Costanzo**

Waterfowl Biologist  
VA Department of Game and Inland Fisheries

Provided guidance for waterfowl hunting proposals on and off the refuge.

**Eric Davis**

Biologist  
USFWS, Region 5 Virginia Field Office

Provided assistance regarding strategies for Federal listed species on or historically occurring on the refuges.

**Sheila Faith**

Former Outdoor Recreation Planner  
Eastern Shore of Virginia National Wildlife Refuge

Provided input on public use strategies. Also, reviewed and commented on draft strategies.

**Carolina Ferro Vasconcelos**

Assistant Planner, Environmental Careers Organization Intern  
USFWS, Region 5 Regional Office

Edited Final CCP and formatted it in PageMaker. Assisted with other tasks necessary to compile and distribute the plan.

**Anne Hecht**

Biologist, Endangered Species  
USFWS, Region 5, Great Meadows National Wildlife Refuge

Assisted in providing information and guidance on background information and strategies related to piping plovers.

**Shelley Hight**

Archaeologist, Division of Visitor Services, Outreach and Cultural Resources  
USFWS, Region 5 Regional Office

Recommended actions pertaining to cultural resources on the Refuges; wrote the cultural resources section of the plan.

**Cindy Kane**

Biologist, Ecological Services  
USFWS, Region 5 Virginia Field Office

Recommended strategies for addressing contamination issues on the Refuge. Also, provided background information on potentially contaminated sites.

**C. Barry Knisley**

Department of Biology  
Randolph-Macon College  
Ashland, Virginia

Provided information and recommendations regarding strategies about the Federal-listed Northeastern beach tiger beetle.



**Hal Laskowski**

Regional Zone Biologist  
USFWS, Prime Hook National Wildlife Refuge

Provided guidance on general species management and research needs for the refuge.

**Jerry Loomis**

Former Electrician (retired)  
Eastern Shore of Virginia National Wildlife Refuge

Provided information on the maintenance needs of the refuge.

**J. Christopher Ludwig**

Chief Biologist, Virginia Natural Heritage Program

Helped define the plant community of Eastern Shore of Virginia Refuge and helped formulate strategies for habitat management.

**Diane Lynch**

Biologist, Endangered Species  
USFWS, Region 5 Regional Office

Provided information and input on strategies concerning the Northeastern beach tiger beetle.

**Gloria McCahon**

Student Temporary Employment Program  
USFWS, Region 5 Regional Office

Edited Final CCP and formatted it in PageMaker.

**Irene Morris**

Office Assistant  
Eastern Shore of Virginia National Wildlife Refuge

Assisted with various tasks to help facilitate meetings and the planning process in general.

**Paul Nickerson**

Former Regional Endangered Species Coordinator (retired)  
USFWS, Region 5 Regional Office

Provided input and information on strategies concerning threatened and endangered species.

**Mary Parkin**

Biologist, Ecological Services  
USFWS, Region 5

Assisted in providing background information and recommendations on the Federal-listed Delmarva fox squirrel.

**Debra Reynolds**

Outdoor Recreation Planner  
Silvio Conte National Fish and Wildlife Refuge

Served as assistant planner for the first year-and-a-half of the planning process.

**Greg Thompson**

Former Cartographer ( currently on External Affairs)  
USFWS, Region 5 Regional Office

Responsible for creating maps related to the CCP and the LPP.  
Provided guidance on map design and detail.

**Linda Shaffer**

Cartographer  
USFWS, Region 5 Regional Office

Assisted in producing CCP and LPP maps.

**Denard Spady**

Executive Director  
Citizens for a Better Eastern Shore

Provided personal accounts of the history of land use on the Eastern Shore of Virginia; suggested land protected strategies.

**Thomas Stewart**

Division Chief of Wildlife and Habitat  
USFWS, Washington Office

Provided guidance on public use and biological issues related to the CCP process.

**Karen Terwilliger**

Resource Management Associates  
Locustville, Virginia

Offered technical advice regarding endangered species and habitat management techniques. Facilitated biological experts workshop.

**Edward Vale**

Student  
University of Massachusetts-Amherst

Edited Draft CCP/EA and formatted it in PageMaker. Assisted with other tasks necessary to compile and distribute the draft.

# Appendix I

## Endangered Species Act Consultation

---

**INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM**

Originating Person and Station Name: Beth Goldstein, U.S. Fish and Wildlife Service,  
Region 5 Regional Office

Telephone and Facsimile Numbers: Phone: (413) 253-8564; Fax: (413) 253-8468.

Date: October 21, 2003

Project Title: Comprehensive Conservation Plan for Eastern Shore of Virginia and  
Fisherman Island National Wildlife Refuges (NWRs)

I. Service Program: National Wildlife Refuge System, Division of Planning

II. Geographic Area Including Name of County/City and State and Specific Project Location:  
Northampton County; Cape Charles, Virginia

See three enclosed black and white maps: "Vicinity Map: Eastern Shore of Virginia and Fisherman Island Refuges", "Refuge Status: Eastern Shore of Virginia Refuge", and "Refuge Status: Fisherman Island Refuge."

III. Proposed Activity:

The Northeastern beach tiger beetle is found on the southern tip beach of the Eastern Shore of Virginia NWR. It is the only listed species suspected to reside on either of the refuges. For this species, we would monitor beach habitat and survey adult beetles to determine the breeding population status. Depending on results from these adult surveys, we would also conduct larval surveys for at least three years to determine if the beetles breed on the refuge. We would assess trespassing on the beach where the beetles are located and we would coordinate with abutters to help protect the beetles. We would also conduct genetic analysis to determine the exact taxonomic identification of this subspecies. All evidence suggests this is the subspecies *Cicindela dorsalis dorsalis*, but specimens resemble the subspecies *Cicindela dorsalis media*, which is not a threatened subspecies.

Piping plovers were last recorded nesting on Fisherman Island NWR in 1992. In the CCP, we propose frequent surveying and increased monitoring which would allow us to detect the presence of breeding pairs and protect them according to Recovery Plan guidelines.

Seabeach amaranth historically occurred in Northampton County. We propose in the CCP to increase surveying efforts for seabeach amaranth on Fisherman Island NWR so we can protect the plant as soon as it is discovered.

IV. Pertinent Species and Habitat Within Action Area

A. Action area (includes **all areas to be affected directly or indirectly** by the proposed project and not merely the immediate area involved in the action).

There are two action areas: the southern tip beach and Fisherman Island NWR. The mile-long southern

tip beach is part of the Eastern Shore of Virginia NWR and is located on the southern tip of the Delmarva Peninsula on the coast of the Chesapeake Bay.

Fisherman Island NWR is an island of about 1,850 acres lying one-half mile south of the southern tip of the Delmarva Peninsula. It is the southern-most barrier island in Virginia.

- B. List of listed species/critical habitat, proposed species/critical habitat, and candidate species known to occur or potentially occurring within the action area. Include species/habitat occurrence on a map (preferably a U.S.G.S. quad.), when known, such that their relationship to the project location can be determined.

The Northeastern beach tiger beetle is known to occur on the southern tip beach. Adult beetles can be found along most of this mile-long stretch of beach. Since we have not yet conducted larval surveys, it is not possible to pinpoint where the larvae burrow.

Piping plovers were last recorded nesting on Fisherman Island NWR in 1992. Occurrence during migration is likely. Seabeach amaranth has not been documented on Refuge property, but it was likely historically present.

V. Determination of Effects

- A. Explanation of the adverse and beneficial effects of the action on species and/or critical habitat listed above.

Surveys of adult and larval Northeastern beach tiger beetles would have beneficial effects as they would provide specific population information, thus allowing us to determine how to better manage their habitat. Genetic analyses would determine whether the specimens belong to the subspecies *Cicindela dorsalis dorsalis*, or whether they are some hybrid of that subspecies and the subspecies *Cicindela dorsalis media*. Genetic testing would result in the mortality of 10-20 specimens.

Increased monitoring and surveying of piping plovers on Fisherman Island NWR would have a beneficial effect as we would be able to protect nesting pairs from potential predators sooner than if we had not increased our efforts.

Increased surveying and monitoring of seabeach amaranth would have a beneficial effect as we would be able to protect the plant from harm sooner than if we had not increased surveying efforts.

- B. Explanation of actions to be implemented to reduce adverse effects:

To mitigate the impacts of taking 10-20 adult Northeastern beach tiger beetle specimens for genetic testing, adult specimens would be collected in the month of August, after the reproduction cycle has ended.

VI. Effect Determination and ES Response Requested**Listed species/designated critical habitat:**

Field Station Determination	Species Name(s)	Recommendation to Ecological Services
Is likely to adversely affect	Northeastern beach tiger beetle	Formal consultation required before genetic testing takes place
Is not likely to adversely affect	Piping plover	Concurrence
Is not likely to adversely affect	Seabeach amaranth	Concurrence

VII. Reviewing Ecological Services Field Office EvaluationA. Concurrence X Nonconcurrence \_\_\_\_\_

B. Formal consultation required \_\_\_\_\_

C. Conference required \_\_\_\_\_

D. Informal conference required \_\_\_\_\_

E. Remarks:

Karin J. Mayne  
Supervisor, Virginia Field Office

11/12/2003  
Date





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
6669 Short Lane  
Gloucester, VA 23061



November 12, 2003

### Memorandum

To: Ms. Beth Goldstein, Team Leader, Refuges, Region 5

From: Supervisor, Ecological Services, Virginia Field Office

Subject: Intra-Service Consultation for the Comprehensive Conservation Plan for Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges (Project # sec7-3071)

The Virginia Field Office (VAFO) received the September 19, 2003 Draft Comprehensive Conservation Plan (CCP) for the Eastern Shore of Virginia National Wildlife Refuge (Refuge) on October 15, 2003. VAFO provided comments on October 27, 2003. VAFO received the Refuge's request for intra-Service consultation on October 31, 2003. The following comments are provided under provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The implementation of the CCP may affect three federally listed threatened species: the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), the piping plover (*Charadrius melodus*), and the seabeach amaranth (*Amaranthus pumilus*). The tiger beetle is a permanent resident on the Refuge and the plover was last recorded on the Refuge in 1992. The amaranth has not been documented on Refuge property, but it was likely historically present.

The CCP proposes monitoring for the piping plover and the seabeach amaranth and, if found, protection in accordance with Recovery Plan guidelines. The proposed monitoring and protection actions are not likely to adversely affect either the piping plover or the seabeach amaranth.

The Refuge proposes to survey for adult tiger beetles, and depending on those results, survey for larvae. Additionally, the Refuge proposes to collect 10-20 adult tiger beetles for genetic testing to verify the species identification. There is a possibility that the Refuge's tiger beetles are *Cicindela dorsalis media*, no Federal status. Collection would occur in August, after the summer mating season.

The Refuge did not make a determination as to the impacts of their proposed action. VAFO believes the proposed action, the implementation of the CCP, is not likely to adversely affect the piping plover

Ms. Beth Goldstein

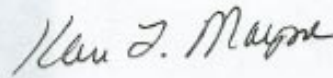
Page 2

or the seabeach amaranth. However, collection of tiger beetles for genetic testing will result in take. Therefore, formal consultation between the Refuge and VAFO is required pursuant to section 7 (CFR 402.14 [c]) for the proposed genetic testing, should such an action be undertaken in the future.

Once a request for formal consultation is made by the Refuge, VAFO will deliver its biological opinion within 135 days. VAFO's biological opinion must be submitted to the Refuge before the Federal action can be authorized. We recommend that you contact VAFO prior to initiating formal consultation so that we can discuss the scope and intent of the consultation process. Your written request to initiate formal consultation should follow the Service's Intra-Service Consultation format.

In addition to formal consultation under ESA section 7 (a)(2), the collection of tiger beetles will require a permit under ESA section 10 (a)(1)(A). The point of contact for section 10 (a)(1)(A) permits is Ms. Diane Lynch at the Regional Office at (413) 253-8628. We will be glad to assist in this process.

If you have any questions, please contact Mr. Eric Davis at (804) 693-6694, extension 104.

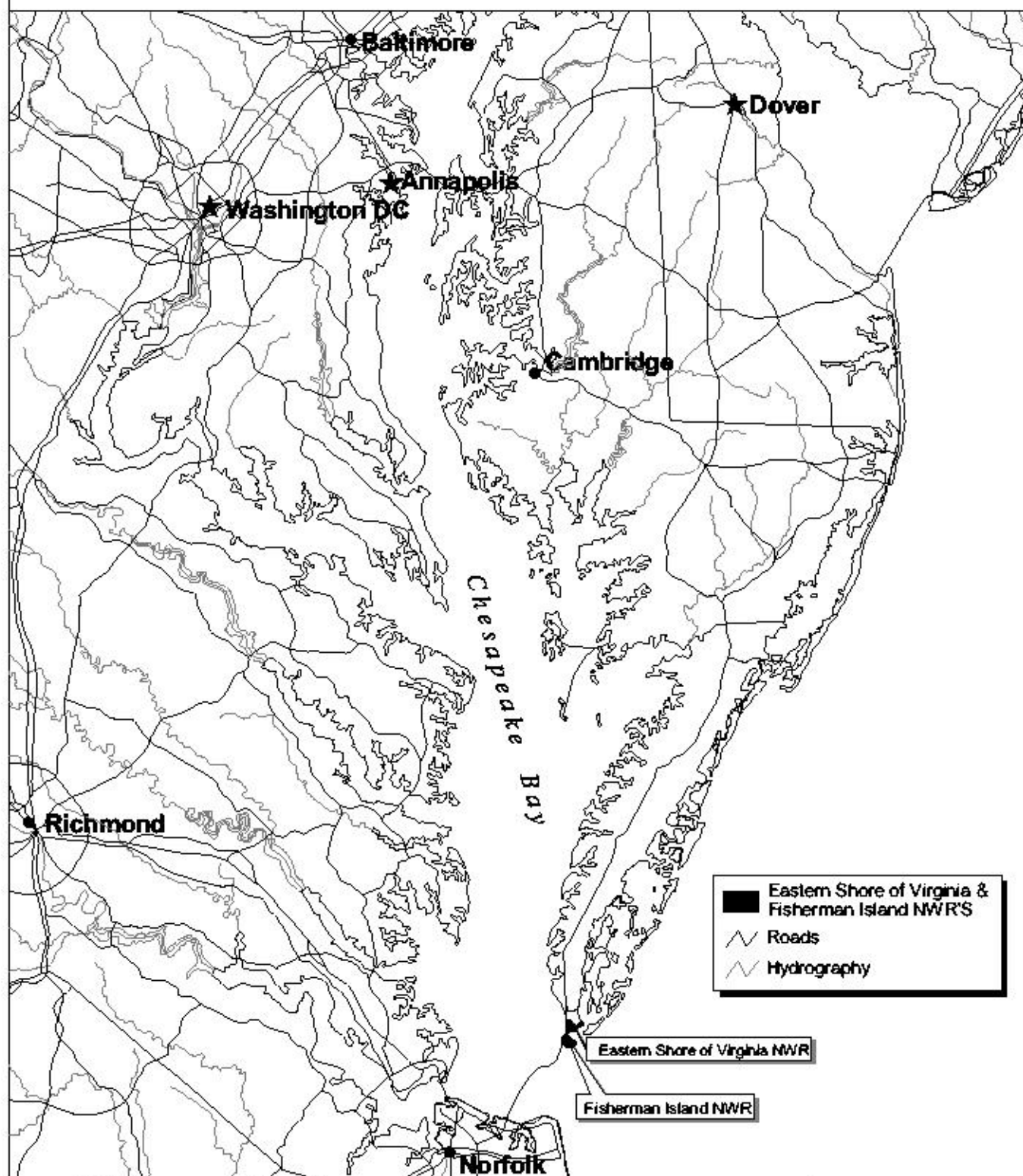


Karen L. Mayne

cc: RO, ES, Hadley, MA (Diane Lynch)  
ESVNWR, Cape Charles, VA (Sue Rice)

# Vicinity Map

## *Eastern Shore of Virginia & Fisherman Island Refuges*



## Data Sources:

All base data provided by USGS. Ecosystem and Refuge Boundaries provided by USFWS.

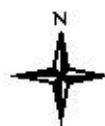
Map prepared for the Eastern Shore of Virginia NWR & Fisherman Island NWR Comprehensive Conservation Plan by the RS Cartography & Spatial Data Services Section. March 2003

This map is for planning purposes only.

0 20 40 60 Miles



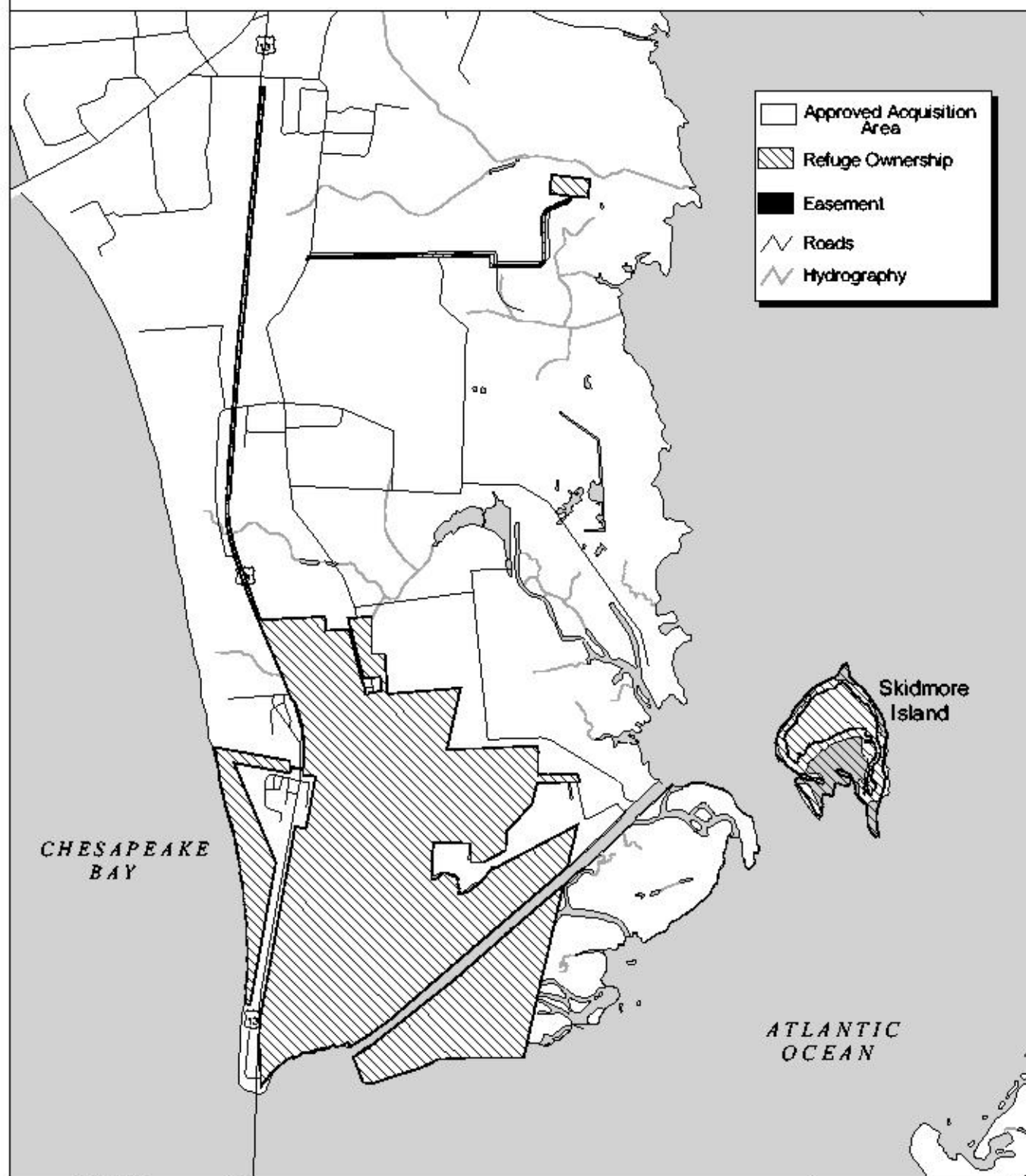
0 30 60 90 Kilometers





# Refuge Status

## *Eastern Shore of Virginia Refuge*



**Data Sources:**  
 1:24,000 Hydrography & 1:100,000 Road  
 data provided by USGS with a caveat dated  
 of 1981 & 1985. All other data provided by  
 USFWS. Projection/Datum: UTM Zone 18,  
 NAD 27, Meters.

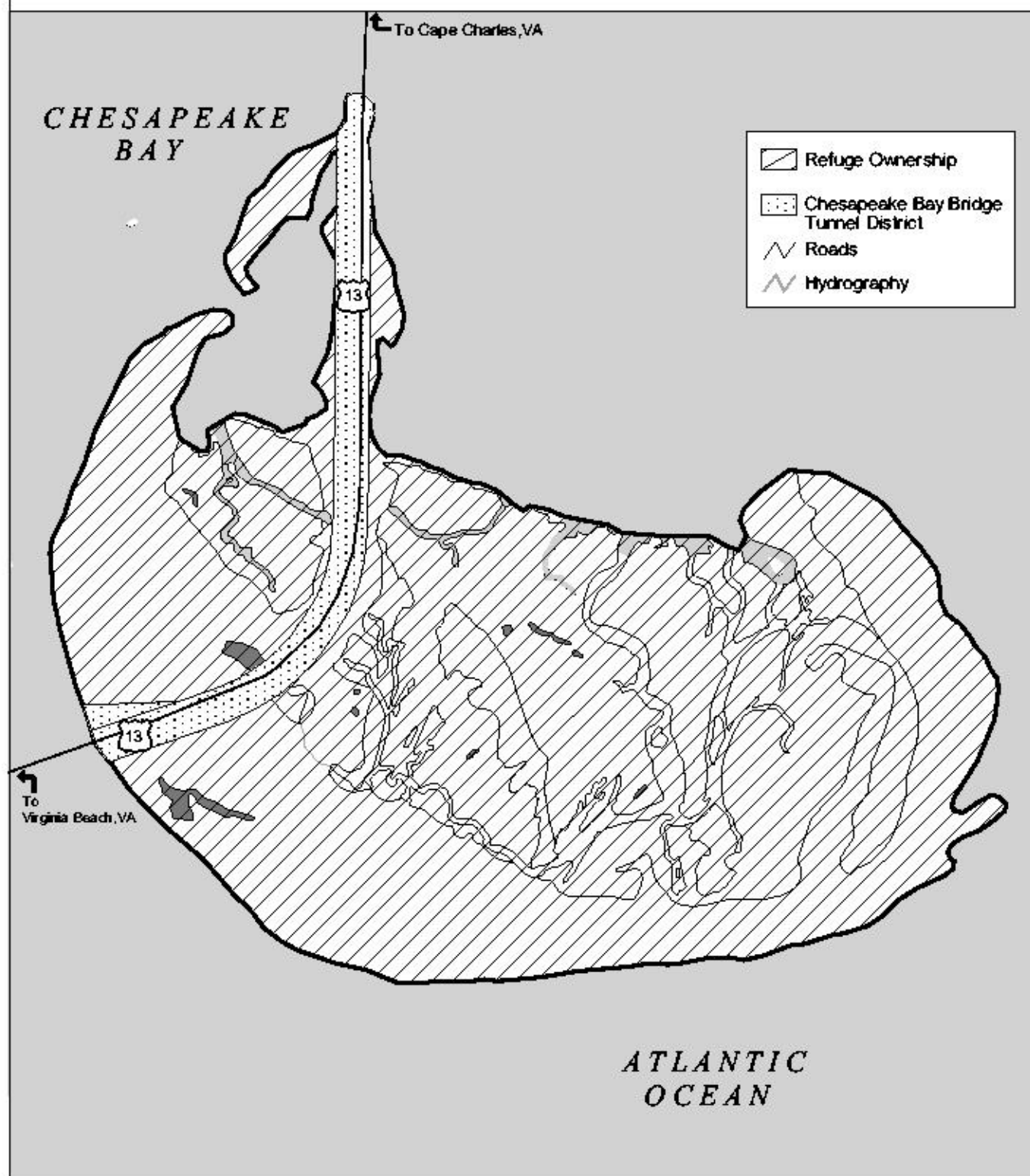
Map prepared for the Eastern Shore of  
 Virginia NWR & Patuxent Island NWR  
 Comprehensive Conservation Plan by the  
 RS Cartography & Spatial Data Service  
 Section. March 2003.

This map is for planning purposes only.



# Refuge Status

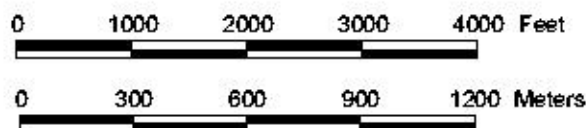
## Fisherman Island Refuge



Data Sources:  
1:24,000 Hydrography & 1:100,000 Road  
data provided by USGS with source dates  
of 1981 & 1989. All other data provided by  
USFWS. Projection/Datum: UTM Zone 18,  
NAD 83, Meters.

Map prepared for the Eastern Shore of  
Virginia MWR & Fisherman Island MWR  
Comprehensive Conservation Plan by the  
RS Cartography & Spatial Data Services  
Section, March 2003.

This map is for planning purposes only.



## Appendix J

# National Historic Preservation Act Consultation



RECEIVED

OCT 30 2003

DEQ-Office of Environmental  
Impact Review

## COMMONWEALTH of VIRGINIA

## Department of Historic Resources

W. Tayloe Murphy, Jr.  
Secretary of Natural Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick  
DirectorTel: (804) 367-2323  
Fax: (804) 367-2391  
TDD: (804) 367-2386  
www.dhr.state.va.us

October 28, 2003

Mr. Charles H. Ellis, III  
Department of Environmental Quality  
Office of Environmental Impact Review  
629 East Main Street, Sixth Floor  
Richmond, Virginia 23219RE: Eastern Shore of Virginia and Fisherman Island National  
Wildlife Refuges Draft Comprehensive Conservation Plan  
Northampton County, Virginia  
DHR File No. 1999-1739

Dear Mr. Ellis:

We have received your request for our review and comment regarding the above referenced document. It is our understanding that the United States Fish and Wildlife Service (USFWS) developed the "Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges Internal Review Draft Comprehensive Conservation Plan" in order to evaluate a reasonable range of alternative management strategies for these Refuges. These alternative management strategies include current management (Alternative A); emphasis on forest and shrub-dependent neotropical and temperate migrants (Alternative B); emphasis on grassland, temperate, and neotropical migrants (Alternative C); and maintaining natural ecosystem dynamics, emphasis on maintaining and restoring historic conditions.

The Eastern Shore of Virginia National Wildlife Refuge and the Fisherman's Island National Wildlife Refuge have several identified cultural resources located within their boundaries. These cultural resources include architectural and archaeological, both historic and pre-historic, properties. There is at least one historic archaeological site with three associated standing structures at Eastern Shore Refuge that is potentially eligible for listing in the National Register of Historic Places. Additionally, Eastern Shore and Fisherman's Island Refuge have extant remnants of Fort John Custis, a World War II-era coastal defense

Administrative Svcs.  
10 Courthouse Avenue  
Petersburg, VA 23803  
Tel: (804) 863-1685  
Fax: (804) 862-6196Petersburg Office  
19-B Bollingbrook Street  
Petersburg, VA 23803  
Tel: (804) 863-1620  
Fax: (804) 863-1627Portsmouth Office  
612 Court Street, 3rd Floor  
Portsmouth, VA 23704  
Tel: (757) 396-6709  
Fax: (757) 396-6712Roanoke Office  
1030 Penmar Avenue, SE  
Roanoke, VA 24013  
Tel: (540) 857-7585  
Fax: (540) 857-7588Winchester Office  
107 N. Kent Street, Suite 203  
Winchester, VA 22601  
Tel: (540) 722-3427  
Fax: (540) 722-7535




Page 2  
October 28, 2003  
Mr. Charles H. Ellis, III

installation, which may be potentially eligible for the National Register and Virginia Landmarks Register. We urge USFWS to take these important cultural resources into consideration when developing its conservation plan. We also remind USFWS of its responsibilities under Section 106 and Section 110 of the National Historic Preservation Act regarding architectural and archaeological resources listed in or eligible for the National Register. The USFWS should continue to consult with us as necessary pursuant to 36 CFR 800.

If you have any questions please call me at (804) 367-2323, Ext. 114.

Sincerely,

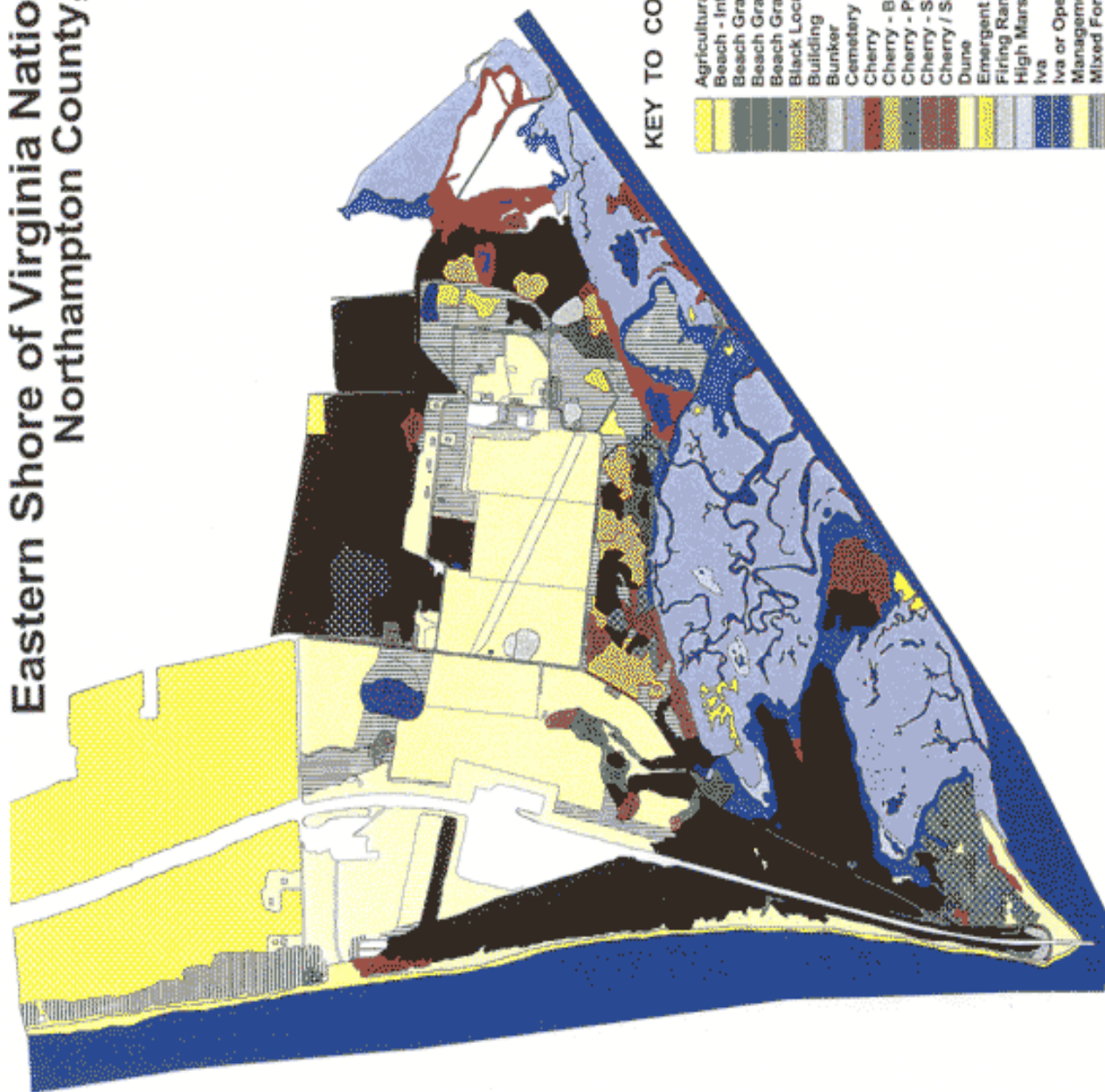
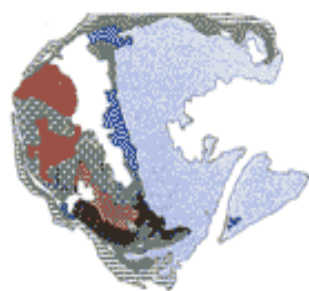


Marc Holma, Architectural Historian  
Office of Review and Compliance

## Appendix K

# Refuge Cover Type Maps

# Eastern Shore of Virginia National Wildlife Refuge Northampton County, Virginia



## KEY TO COVERTYPES

Agricultural Field
Beach - Intertidal / Sand
Beach Grass
Beach Grass - Sand
Beach Grass / Iva
Black Locust
Building
Bunker
Cemetery
Cherry
Cherry - Black Locust
Cherry - Pine
Cherry - Sassafras
Cherry / Sassafras
Dune
Emergent Wetland
Firing Range
High Marsh
Iva
Iva or Open Water
Management Field
Mixed Forest

Mixed Oak / Pine
Mixed Pine / Oak
Myrtle
Myrtle - Phragmites
Myrtle / cherry
Open Water
Phragmites
Pine
Pine / Cherry
Road - Parking Area
Rock
Saltmarsh
Sassafras
Sassafras / Pine
Scrub-Shrub
Scrub-Shrub Wetland
Sewage Treatment
Short Grass
Shrub (Privet)
Tideflat
Virginia Pine
Wildlife Plantings

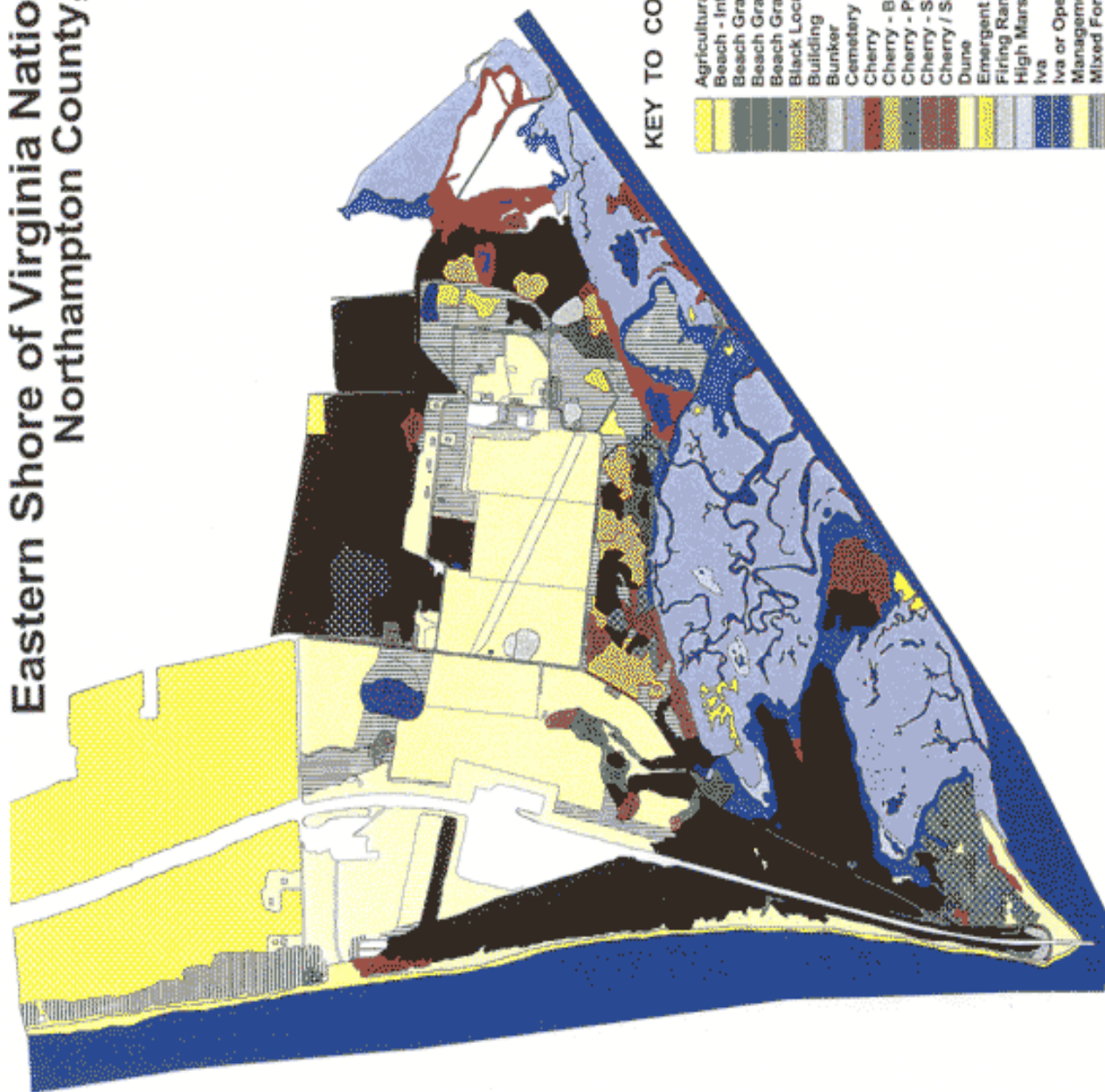
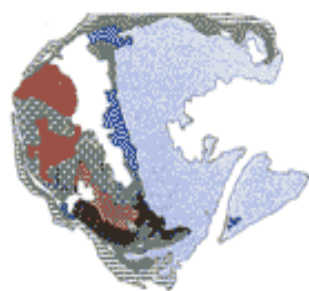




## Appendix K

# Refuge Cover Type Maps

# Eastern Shore of Virginia National Wildlife Refuge Northampton County, Virginia

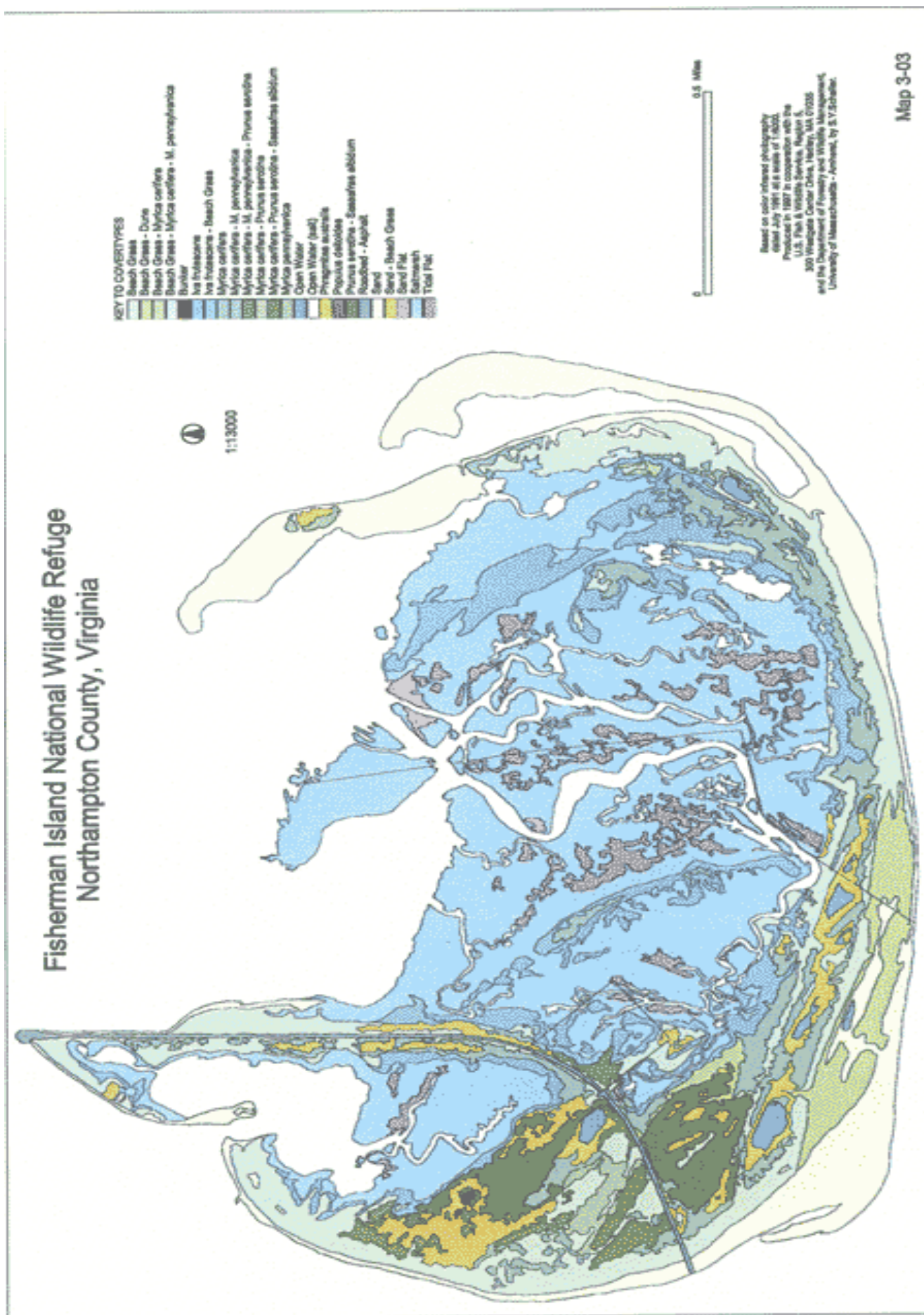


## KEY TO COVERTYPES

Agricultural Field
Beach - Intertidal / Sand
Beach Grass
Beach Grass - Sand
Beach Grass / Iva
Black Locust
Building
Bunker
Cemetery
Cherry
Cherry - Black Locust
Cherry - Pine
Cherry - Sassafras
Cherry / Sassafras
Dune
Emergent Wetland
Firing Range
High Marsh
Iva
Iva or Open Water
Management Field
Mixed Forest

Mixed Oak / Pine
Mixed Pine / Oak
Myrtle
Myrtle - Phragmites
Myrtle / cherry
Open Water
Phragmites
Pine
Pine / Cherry
Road - Parking Area
Rock
Saltmarsh
Sassafras
Sassafras / Pine
Scrub-Shrub
Scrub-Shrub Wetland
Sewage Treatment
Short Grass
Shrub (Privet)
Tideflat
Virginia Pine
Wildlife Plantings







# Appendix L

## Refuge Species List

## Birds of the Eastern Shore of Virginia and Fisherman Island Refuges

### Season:

s - Spring	March - May
S - Summer	June - August
F - Fall	September - November
W - Winter	December - February

### Relative Abundance

a - abundant	a species which is very numerous
c - common	likely to be seen or heard in suitable habitat
u - uncommon	present, but not certain to be seen
o - occasional	seen only a few times during a season
r - rare	may be present but not every year

Common name	Scientific name	Seasonal Occurrences			
		<i>s</i>	<i>S</i>	<i>F</i>	<i>W</i>
LOONS - GREBES					
Red-throated loon	<i>Gavia stellata</i>	<i>u</i>		<i>u</i>	<i>u</i>
Common loon	<i>Gavia immer</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Horned grebe	<i>Podiceps auritus</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>u</i>
Red-necked grebe	<i>Podiceps grisegena</i>	<i>r</i>		<i>r</i>	<i>o</i>
STORM-PETREL					
Wilson's storm-petrel	<i>Oceanites oceanicus</i>	<i>r</i>	<i>r</i>		
GANNET - PELICANS - CORMORANTS					
Northern gannet	<i>Morus bassanus</i>	<i>o</i>		<i>o</i>	<i>u</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
Brown pelican	<i>Pelecanus occidentalis</i>	<i>o</i>	<i>c</i>	<i>c</i>	<i>r</i>
Great cormorant	<i>Phalacrocorax carbo</i>	<i>u</i>		<i>o</i>	<i>u</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
BITTERNS -HERONS - IBISES					
American bittern	<i>Botaurus lentiginosus</i>	<i>u</i>		<i>u</i>	<i>u</i>
Least bittern	<i>Ixobrychus exilis</i>		<i>o</i>		
Great blue heron	<i>Ardea herodias</i>	<i>u</i>	<i>u</i>	<i>c</i>	<i>u</i>
Great egret	<i>Casmerodius albus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>o</i>
Snowy egret	<i>Egretta thula</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>o</i>
Little blue heron	<i>Egretta caerulea</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>o</i>
Tricolored heron	<i>Egretta tricolor</i>	<i>u</i>	<i>c</i>	<i>c</i>	<i>u</i>
Cattle egret	<i>Bubulcus ibis</i>	<i>u</i>	<i>u</i>	<i>c</i>	
Green-backed heron	<i>Butorides striatus</i>	<i>u</i>	<i>c</i>	<i>c</i>	<i>r</i>
Black-crowned	<i>Nycticorax nycticorax</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>u</i>
Night-heron					
Yellow-crowned	<i>Nyctanassa violacea</i>	<i>u</i>	<i>u</i>	<i>r</i>	
Night-heron					

Common name	Scientific name	Seasonal Occurrences			
		<b>s</b>	<b>S</b>	<b>F</b>	<b>W</b>
White ibis	<i>Eudocimus albus</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
Glossy ibis	<i>Plegadis falcinellus</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>r</i>
Sandhill crane	<i>Grus canadensis</i>	<i>r</i>			

**SWANS - GEESE - DUCKS**

Tundra swan	<i>Cygnus columbianus</i>	<i>u</i>		<i>u</i>	<i>u</i>
Mute swan	<i>Cygnus olor</i>	<i>r</i>			<i>r</i>
Snow goose	<i>Chen caerulescans</i>	<i>u</i>		<i>u</i>	<i>u</i>
Brant	<i>Branta bernicla</i>	<i>u</i>		<i>u</i>	<i>c</i>
Canada goose	<i>Branta canadensis</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>c</i>
Wood duck	<i>Aix sponsa</i>	<i>u</i>	<i>o</i>	<i>o</i>	
Green-winged teal	<i>Anas crecca</i>	<i>c</i>	<i>r</i>	<i>u</i>	<i>u</i>
American black duck	<i>Anas rubripes</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Mallard	<i>Anas platyrhynchos</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Northern pintail	<i>Anas acuta</i>	<i>u</i>		<i>u</i>	<i>u</i>
Blue-winged teal	<i>Anas discors</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>o</i>
Northern shoveler	<i>Anas clypeata</i>	<i>c</i>		<i>u</i>	<i>u</i>
Gadwall	<i>Anas strepera</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>u</i>
Eurasian wigeon	<i>Anas penelope</i>				<i>r</i>
American wigeon	<i>Anas americana</i>	<i>u</i>		<i>u</i>	<i>u</i>
Canvasback	<i>Aythya valisineria</i>	<i>o</i>		<i>o</i>	<i>o</i>
Redhead	<i>Aythya americana</i>	<i>o</i>		<i>o</i>	<i>o</i>
Ring-necked duck	<i>Aythya collaris</i>	<i>o</i>		<i>o</i>	<i>u</i>
Greater scaup	<i>Aythya marila</i>	<i>u</i>		<i>u</i>	<i>u</i>
Lesser scaup	<i>Aythya affinis</i>	<i>u</i>		<i>u</i>	<i>u</i>
Common eider	<i>Somateria mollissima</i>				<i>r</i>
King eider	<i>Somateria spectabilis</i>				<i>r</i>
Harlequin duck	<i>Histrionicus histrionicus</i>	<i>r</i>			<i>r</i>
Long-tailed duck	<i>Clangula hyemalis</i>	<i>u</i>		<i>u</i>	<i>u</i>
Black scoter	<i>Melanitta nigra</i>	<i>u</i>		<i>u</i>	<i>c</i>
Surf scoter	<i>Melanitta perspicillata</i>	<i>c</i>	<i>r</i>	<i>c</i>	<i>c</i>
White-winged scoter	<i>Melanitta fusca</i>	<i>u</i>		<i>u</i>	<i>u</i>
Common goldeneye	<i>Bucephala clangula</i>				<i>u</i>
Bufflehead	<i>Bucephala albeola</i>	<i>c</i>		<i>c</i>	<i>c</i>
Hooded merganser	<i>Lophodytes cucullatus</i>	<i>c</i>		<i>u</i>	<i>u</i>
Common merganser	<i>Mergus merganser</i>				<i>u</i>
Red-breasted merganser	<i>Mergus serrator</i>	<i>c</i>	<i>r</i>	<i>c</i>	<i>c</i>
Ruddy duck	<i>Oxyura jamaicensis</i>	<i>o</i>		<i>u</i>	<i>u</i>

**VULTURES - HAWKS - FALCONS**

Black vulture	<i>Coragyps atratus</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>u</i>
Turkey vulture	<i>Cathartes aura</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Osprey	<i>Pandion haliaetus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>r</i>
Mississippi kite	<i>Ictinia mississippiensis</i>	<i>r</i>	<i>r</i>		

Common name	Scientific name	Seasonal Occurrences			
		<i>s</i>	<i>S</i>	<i>F</i>	<i>W</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>		u	u	u
Golden eagle	<i>Aquila chrysaetos</i>			r	r
Northern harrier	<i>Circus cyaneus</i>	c	o	c	c
Sharp-shinned hawk	<i>Accipiter striatus</i>	u		a	u
Cooper's hawk	<i>Accipiter cooperii</i>	u		u	u
Northern goshawk	<i>Accipiter gentilis</i>		r	r	
Red-shouldered hawk	<i>Buteo lineatus</i>	u	o	u	u
Broad-winged hawk	<i>Buteo platypterus</i>	u		c	
Swainson's hawk	<i>Buteo swainsoni</i>			r	
Red-tailed hawk	<i>Buteo jamaicensis</i>	c	u	c	c
Rough-legged hawk	<i>Buteo lagopus</i>	r		r	r
American kestrel	<i>Falco sparverius</i>	u	u	a	u
Merlin	<i>Falco columbarius</i>	u		c	u
Peregrine falcon	<i>Falco peregrinus</i>	u	u	c	u
<b>QUAIL</b>					
Northern bobwhite	<i>Colinus virginianus</i>	c	c	c	c
Wild turkey	<i>Meleagris gallopavo</i>	u	u	u	u
<b>RAILS - CRANES</b>					
Yellow rail	<i>Coturnicops noveboracensis</i>			r	
Black rail	<i>Laterallus jamaicensis</i>			r	
Clapper rail	<i>Rallus longirostris</i>	c	c	a	u
King rail	<i>Rallus elegans</i>	u	o	u	u
Virginia rail	<i>Rallus limicola</i>	u	u	u	u
Sora	<i>Porzana carolina</i>	u		u	o
Common moorhen	<i>Gallinula chloropus</i>	o	o	o	r
American coot	<i>Fulica americana</i>	u		u	u
<b>PLOVERS - SANDPIPERS</b>					
Black-bellied plover	<i>Pluvialis squatarola</i>	c	o	c	u
Lesser Golden plover	<i>Pluvialis dominica</i>		o	o	
Semipalmated plover	<i>Charadrius semipalmatus</i>	c	o	c	o
Piping plover	<i>Charadrius melodus</i>	u	u	u	r
Killdeer	<i>Charadrius vociferus</i>	c	u	u	u
American oystercatcher	<i>Haematopus palliatus</i>	c	c	c	c
American avocet	<i>Recurvirostra americana</i>	r		r	r
Black-necked stilt	<i>Himantopus mexicanus</i>	o	r		
Greater yellowlegs	<i>Tringa melanoleuca</i>	c	o	c	u
Lesser yellowlegs	<i>Tringa flavipes</i>	u	o	c	u
Solitary sandpiper	<i>Tringa solitaria</i>	u	u	u	
Willet	<i>Catoptrophorus semipalmatus</i>	c	c	c	u
Spotted sandpiper	<i>Actitis macularia</i>	c	u	c	r
Upland sandpiper	<i>Bartramia longicauda</i>	o	u	u	
Whimbrel	<i>Numenius phaeopus</i>	u	u	u	o
Marbled godwit	<i>Limosa fedoa</i>	o	o	o	
Ruddy turnstone	<i>Arenaria interpres</i>	u	u	u	u
Red knot	<i>Calidris canutus</i>	u	u	u	r
Sanderling	<i>Caladris alba</i>	c	u	c	c

Common name	Scientific name	Seasonal Occurrences			
		<b>s</b>	<b>S</b>	<b>F</b>	<b>W</b>
Semipalmated sandpiper	<i>Calidris pusilla</i>	c	u	u	
Western sandpiper	<i>Calidris mauri</i>	u	u	u	u
Least sandpiper	<i>Calidris minutilla</i>	c	u	u	r
White-rumped sandpiper	<i>Calidris fuscicollis</i>	u	u	u	
Pectoral sandpiper	<i>Calidris acuminata</i>	u	u	u	
Dunlin	<i>Calidrus tenuirostris</i>	c	o	c	c
Stilt sandpiper	<i>Calidrus himantopus</i>	o	u	u	
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>		o	o	
Short-billed dowitcher	<i>Limnodromus griseus</i>	c	u	c	o
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>		o	o	o
Common snipe	<i>Gallinago gallinago</i>	c		u	u
American woodcock	<i>Scolopax minor</i>	u	o	c	a
Wilson's phalarope	<i>Phalaropus tricolor</i>		o	o	

**GULLS - TERNS**

Laughing gull	<i>Larus atricilla</i>	a	a	a	o
Bonaparte's gull	<i>Larus philadelphia</i>	u		u	u
Ring-billed gull	<i>Larus delawarensis</i>	c	o	c	c
Herring gull	<i>Larus argentatus</i>	a	c	a	a
Lesser black-backed gull	<i>Larus fuscus</i>	r		o	o
Great black-backed gull	<i>Larus marinus</i>	c	u	u	c
Iceland gull	<i>Larus glaucoides</i>	r			
Gull-billed tern	<i>Sterna nilotica</i>	u	u	u	
Caspian tern	<i>Sterna caspia</i>	u	u	c	
Royal tern	<i>Sterna maxima</i>	a	a	c	r
Sandwich tern	<i>Sterna sandvicensis</i>	o	o	o	
Common tern	<i>Sterna hirundo</i>	u	u	c	
Forster's tern	<i>Sterna forsteri</i>	c	u	a	o
Least tern	<i>Sterna antillarum</i>	u	u	o	
Black tern	<i>Chlidonias niger</i>	o	o	u	
Black skimmer	<i>Rynchops niger</i>	c	c	c	r

**DOVES - CUCKOOS - OWLS - SWIFTS - HUMMINGBIRDS**

Rock dove	<i>Columba livia</i>	u	c	c	c
Mourning dove	<i>Zenaida macroura</i>	c	c	c	c
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>			o	
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	o	u	u	
Barn owl	<i>Tyto alba</i>	u	u	u	u
Eastern screech-owl	<i>Otus asio</i>	u	c	c	c
Great Horned owl	<i>Bubo virginianus</i>	c	c	c	c
Long-eared owl	<i>Asio otus</i>			o	o
Short-eared owl	<i>Asio flammeus</i>	o		u	u
Northern saw-whet owl	<i>Aegolius acadicus</i>			o	c
Common nighthawk	<i>Chordeiles minor</i>	u	u	u	
Chuck-will's widow	<i>Caprimulgus carolinensis</i>	u	c	o	
Whip-poor-will	<i>Caprimulgus vociferus</i>	o		o	
Chimney swift	<i>Chaetura pelagica</i>	u	u	c	
Ruby-throated hummingbird	<i>Archilochus colubris</i>	c	u	u	
Belted kingfisher	<i>Ceryle alcyon</i>	c	o	c	u

Common name	Scientific name	Seasonal Occurrences			
		<i>s</i>	<i>S</i>	<i>F</i>	<i>W</i>
WOODPECKERS - FLYCATCHERS					
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>		<i>o</i>	<i>u</i>	<i>o</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>u</i>
Yellow-bellied sapsucker	<i>Sphyrapicus ruber</i>	<i>o</i>		<i>u</i>	<i>u</i>
Downy woodpecker	<i>Picoides pubescens</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>o</i>
Hairy woodpecker	<i>Picoides villosus</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Northern flicker	<i>Colaptes auratus</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>c</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>	<i>u</i>	<i>o</i>	<i>o</i>	<i>o</i>
Olive-sided flycatcher	<i>Contopus borealis</i>	<i>r</i>		<i>r</i>	
Eastern wood-pewee	<i>Contopus virens</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>		<i>u</i>		
Acadian flycatcher	<i>Empidonax virescens</i>	<i>o</i>	<i>o</i>	<i>u</i>	
Alder flycatcher	<i>Empidonax alnorum</i>			<i>u</i>	
Willow flycatcher	<i>Empidonax traillii</i>			<i>u</i>	
Least flycatcher	<i>Empidonax minimus</i>	<i>o</i>		<i>u</i>	
Eastern phoebe	<i>Sayornis phoebe</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>o</i>
Say's phoebe	<i>Sayornis saya</i>			<i>r</i>	
Great crested flycatcher	<i>Myiarchus crinitus</i>	<i>c</i>	<i>u</i>	<i>u</i>	
Western kingbird	<i>Tyrannus verticalis</i>			<i>o</i>	<i>r</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>	<i>c</i>	<i>c</i>	<i>a</i>	
Scissor-tailed flycatcher	<i>Tyrannus forficatus</i>		<i>r</i>	<i>r</i>	
LARKS - SWALLOWS - JAYS - CROWS					
Horned lark	<i>Eremophila alpestris</i>	<i>u</i>		<i>u</i>	<i>u</i>
Purple martin	<i>Progne subis</i>	<i>c</i>	<i>c</i>	<i>u</i>	
Tree swallow	<i>Tachycineta bicolor</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>o</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Bank swallow	<i>Riparia riparia</i>	<i>u</i>	<i>u</i>	<i>c</i>	
Cliff swallow	<i>Hirundo pyrrhonota</i>	<i>o</i>	<i>o</i>	<i>u</i>	
Barn swallow	<i>Hirundo rustica</i>	<i>c</i>	<i>a</i>	<i>a</i>	
Blue jay	<i>Cyanocitta cristata</i>	<i>u</i>	<i>u</i>	<i>a</i>	<i>c</i>
American crow	<i>Corvus brachyrhynchos</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Fish crow	<i>Corvus ossifragus</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>c</i>
TITMICE - NUTHATCHES - WRENS					
Carolina chickadee	<i>Parus carolinensis</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Tufted titmouse	<i>Parus bicolor</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>	<i>u</i>		<i>c</i>	<i>c</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>	<i>o</i>		<i>u</i>	<i>u</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>u</i>
Brown creeper	<i>Certhia americana</i>	<i>u</i>		<i>c</i>	<i>u</i>
Carolina wren	<i>Thryothorus ludovicianus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
House wren	<i>Troglodytes aedon</i>	<i>u</i>	<i>u</i>	<i>c</i>	<i>u</i>
Winter wren	<i>Troglodytes troglodytes</i>	<i>u</i>		<i>u</i>	<i>u</i>
Sedge wren	<i>Cistothorus platensis</i>	<i>u</i>		<i>u</i>	<i>u</i>
Marsh wren	<i>Cistothorus palustris</i>	<i>u</i>	<i>u</i>	<i>c</i>	<i>u</i>
KINGLETS - THRUSHES - THRASHERS					
Golden-crowned kinglet	<i>Regulus satrapa</i>	<i>u</i>		<i>c</i>	<i>c</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>	<i>u</i>		<i>a</i>	<i>c</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	<i>c</i>	<i>o</i>	<i>u</i>	<i>r</i>

Common name	Scientific name	Seasonal Occurrences			
		<b>s</b>	<b>S</b>	<b>F</b>	<b>W</b>
Eastern bluebird	<i>Sialia sialis</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>u</i>
Veery	<i>Catharus fuscescens</i>	<i>u</i>		<i>c</i>	
Gray-cheeked thrush	<i>Catharus minimus</i>	<i>u</i>		<i>u</i>	
Swainson's thrush	<i>Catharus ustulatus</i>	<i>u</i>		<i>c</i>	
Binknell's thrush	<i>Catharus minimus</i>	<i>o</i>			
Hermit thrush	<i>Catharus guttatus</i>	<i>u</i>		<i>c</i>	<i>u</i>
Wood thrush	<i>Hylocichla mustelina</i>	<i>u</i>	<i>o</i>	<i>u</i>	
American robin	<i>Turdus migratorius</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>c</i>
Gray catbird	<i>Dumetella carolinensis</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>u</i>
Northern mockingbird	<i>Mimus polyglottos</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>u</i>
Brown thrasher	<i>Toxostoma rufum</i>	<i>u</i>	<i>u</i>	<i>c</i>	<i>u</i>

**WAXWINGS - SHRIKE - STARLING**

American pipit	<i>Anthus rubescens</i>	<i>u</i>		<i>c</i>	<i>u</i>
Cedar waxwing	<i>Bombycilla garrulus</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>u</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>	<i>r</i>		<i>r</i>	<i>r</i>
European starling	<i>Sternus vulgaris</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>

**VIREO - WOOD WARBLERS**

White-eyed vireo	<i>Vireo atricapillus</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>r</i>
Blue-headed vireo	<i>Vireo solitarius</i>	<i>u</i>		<i>u</i>	<i>r</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>	<i>o</i>		<i>r</i>	
Warbling vireo	<i>Vireo gilvus</i>	<i>o</i>		<i>r</i>	
Philadelphia vireo	<i>Vireo philadelphicus</i>	<i>o</i>		<i>r</i>	
Red-eyed vireo	<i>Vireo olivaceus</i>	<i>u</i>	<i>u</i>	<i>c</i>	
Blue-winged warbler	<i>Vermivora pinus</i>	<i>o</i>		<i>u</i>	
Golden-winged warbler	<i>Vermivora chrysoptera</i>			<i>r</i>	
Tennessee warbler	<i>Vermivora peregrina</i>	<i>o</i>		<i>u</i>	
Orange-crowned warbler	<i>Vermivora celata</i>	<i>o</i>		<i>o</i>	<i>u</i>
Nashville warbler	<i>Vermivora ruficapilla</i>	<i>o</i>		<i>u</i>	
Northern parula	<i>Parula americana</i>	<i>c</i>		<i>u</i>	
Yellow warbler	<i>Dendroica petechia</i>	<i>c</i>	<i>u</i>	<i>c</i>	
Chestnut-sided warbler	<i>Dendroica pensylvanica</i>	<i>u</i>		<i>u</i>	
Magnolia warbler	<i>Dendroica magnolia</i>	<i>u</i>		<i>c</i>	
Cape May warbler	<i>Dendroica tigrina</i>	<i>o</i>		<i>c</i>	
Black-throated blue warbler	<i>Dendroica caerulescens</i>	<i>c</i>		<i>c</i>	
Yellow-rumped warbler	<i>Dendroica coronata</i>	<i>a</i>		<i>a</i>	<i>a</i>
Black-throated green warbler	<i>Dendroica virens</i>	<i>u</i>		<i>u</i>	
Blackburnian warbler	<i>Dendroica fusca</i>	<i>o</i>		<i>u</i>	
Yellow-throated warbler	<i>Dendroica dominica</i>	<i>u</i>		<i>o</i>	
Pine warbler	<i>Dendroica pinus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>u</i>
Prairie warbler	<i>Dendroica discolor</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>r</i>
Palm warbler	<i>Dendroica palmarum</i>	<i>u</i>		<i>c</i>	<i>u</i>
Bay-breasted warbler	<i>Dendroica castanae</i>	<i>o</i>		<i>u</i>	
Blackpoll warbler	<i>Dendroica striata</i>	<i>u</i>		<i>c</i>	
Cerulean warbler	<i>Dendroica cerulea</i>		<i>r</i>		
Black-and-white warbler	<i>Mniotilta varia</i>	<i>u</i>		<i>c</i>	<i>r</i>
American redstart	<i>Setophaga ruticilla</i>	<i>c</i>		<i>a</i>	
Prothonotary warbler	<i>Protonotaria citrea</i>	<i>o</i>		<i>o</i>	
Worm-eating warbler	<i>Helmitheros vernivorus</i>	<i>o</i>		<i>u</i>	
Ovenbird	<i>Seiurus aurocapillus</i>	<i>c</i>	<i>o</i>	<i>a</i>	<i>r</i>



Common name	Scientific name	Seasonal Occurrences			
		<b>s</b>	<b>S</b>	<b>F</b>	<b>W</b>
Northern waterthrush	<i>Seiurus noveboracensis</i>	<i>u</i>	<i>u</i>	<i>c</i>	
Louisiana waterthrush	<i>Seiurus motacilla</i>	<i>o</i>	<i>r</i>	<i>r</i>	
Kentucky warbler	<i>Oporornis formosus</i>	<i>o</i>		<i>o</i>	
Connecticut warbler	<i>Oporornis agilis</i>			<i>u</i>	
Mourning warbler	<i>Oporornis philadelphia</i>	<i>o</i>		<i>u</i>	
Common yellowthroat	<i>Geothlypis trichas</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>o</i>
Hooded warbler	<i>Wilsonia citrina</i>	<i>o</i>		<i>o</i>	
Wilson's warbler	<i>Wilsonia pusilla</i>	<i>u</i>		<i>u</i>	
Canada warbler	<i>Wilsonia canadensis</i>	<i>u</i>		<i>u</i>	
Yellow-breasted chat	<i>Icteria virens</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>o</i>

**TANAGERS - SPARROWS**

Summer tanager	<i>Piranga rubra</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Scarlet tanager	<i>Piranga olivacea</i>	<i>u</i>		<i>u</i>	
Northern cardinal	<i>Cardinalis cardinalis</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	<i>o</i>		<i>u</i>	
Blue grosbeak	<i>Guiraca caerulea</i>	<i>c</i>	<i>u</i>	<i>u</i>	
Indigo bunting	<i>Passerina cyanea</i>	<i>c</i>	<i>u</i>	<i>c</i>	
Dickcissel	<i>Spiza americana</i>	<i>o</i>		<i>c</i>	
Eastern towhee	<i>Pipilo erythrophthalmus</i>	<i>c</i>	<i>u</i>	<i>a</i>	<i>c</i>
American tree sparrow	<i>Spizella arborea</i>	<i>r</i>			<i>r</i>
Clay-colored sparrow	<i>Spizella pallida</i>			<i>r</i>	
Chipping sparrow	<i>Spizella passerina</i>	<i>u</i>	<i>o</i>	<i>c</i>	<i>o</i>
Field sparrow	<i>Spizella pusilla</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>u</i>
Vesper sparrow	<i>Pooecetes gramineus</i>	<i>o</i>		<i>u</i>	<i>u</i>
Lark sparrow	<i>Chondestes grammacus</i>			<i>r</i>	
Savanna sparrow	<i>Passerculus sandwichensis</i>	<i>u</i>		<i>c</i>	<i>c</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>	<i>u</i>	<i>o</i>	<i>u</i>	
Henslow's sparrow	<i>Ammodramus henslowii</i>		<i>r</i>		
Saltmarsh sharp-tailed sparrow	<i>Ammodramus caudacutus</i>	<i>c</i>	<i>o</i>	<i>u</i>	<i>u</i>
Seaside sparrow	<i>Ammodramus maritimus</i>	<i>c</i>	<i>u</i>	<i>a</i>	<i>u</i>
Fox sparrow	<i>Passerella iliaca</i>	<i>o</i>		<i>u</i>	<i>u</i>
Song sparrow	<i>Melospiza melodia</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>a</i>
Lincoln's sparrow	<i>Melospiza lincolnii</i>	<i>r</i>		<i>r</i>	<i>r</i>
Swamp sparrow	<i>Melospiza georgiana</i>	<i>c</i>		<i>a</i>	<i>c</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>	<i>c</i>		<i>a</i>	<i>a</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	<i>o</i>		<i>o</i>	<i>o</i>
Dark-eyed junco	<i>Junco hyemalis</i>	<i>u</i>		<i>u</i>	<i>u</i>
Lapland longspur	<i>Calcarius lapponicus</i>			<i>o</i>	<i>o</i>
Snow bunting	<i>Plectrophenax nivalis</i>			<i>o</i>	<i>o</i>

**BLACKBIRDS - FINCHES**

Bobolink	<i>Dolichonyx oryzivorus</i>	<i>u</i>	<i>o</i>	<i>a</i>	
Red-winged blackbird	<i>Agelaius phoeniceus</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>c</i>
Eastern meadowlark	<i>Sturnell magna</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Rusty blackbird	<i>Euphagus carolinus</i>	<i>o</i>		<i>c</i>	<i>u</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>				<i>r</i>
Boat-tailed grackle	<i>Quiscalus major</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>c</i>
Common grackle	<i>Quiscalus quiscula</i>	<i>a</i>	<i>a</i>	<i>c</i>	<i>c</i>

Common name	Scientific name	Seasonal Occurrences			
		<b>s</b>	<b>S</b>	<b>F</b>	<b>W</b>
Brown-headed cowbird	<i>Molothrus ater</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>u</i>
Orchard oriole	<i>Icterus spurius</i>	<i>c</i>	<i>u</i>	<i>r</i>	
Baltimore oriole	<i>Icterus galbula</i>	<i>u</i>	<i>c</i>	<i>r</i>	<i>o</i>
Purple finch	<i>Carpodacus purpureus</i>	<i>o</i>		<i>u</i>	<i>u</i>
House finch	<i>Carpodacus mexicanus</i>	<i>c</i>	<i>o</i>	<i>u</i>	<i>u</i>
Red crossbill	<i>Loxia curvirostra</i>			<i>o</i>	<i>o</i>
White-winged crossbill	<i>Loxia leucoptera</i>				<i>r</i>
Common redpoll	<i>Carduelis flammea</i>				<i>r</i>
Pine siskin	<i>Carduelis pinus</i>	<i>o</i>		<i>c</i>	<i>c</i>
American goldfinch	<i>Carduelis tristis</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>c</i>
Evening grosbeak	<i>Coccothraustes vespertinus</i>		<i>u</i>	<i>u</i>	
House sparrow	<i>Passer domesticus</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>

### Reptiles and Amphibians of the Eastern Shore of Virginia Refuge

#### Frogs and Toads

Eastern cricket frog	<i>Acris crepitans</i>
Eastern American toad	<i>Bufo americanus</i>
Fowler's toad	<i>Bufo fowleri</i>
Cope's gray treefrog	<i>Hyla chrysoscelis</i>
Northern spring peeper	<i>Pseudacris crucifer</i>
New Jersey chorus frog	<i>Pseudacris feriarum kalmi</i>
Southern green frog	<i>Rana clamitans melonata</i>
Southern leopard frog	<i>Rana sphenoccephala utricularius</i>
American bullfrog	<i>Rana catesbeiana</i>
Pickerel frog	<i>Rana palustris</i>
Eastern narrow-mouthed toad	<i>Gastrophryne carolinensis</i>

#### Freshwater, Sea, and Estuarine turtles

Eastern painted turtle	<i>Chrysemys picta</i>
Spotted turtle	<i>Clemmys guttata</i>
Eastern mud turtle	<i>Kinsternon subrubrum</i>
Northern red-bellied cooter	<i>Pseudemys rubriventris</i>
Eastern box turtle	<i>Terrapene carolina</i>
Eastern snapping turtle	<i>Chelydra serpentina</i>
Loggerhead sea turtle	<i>Caretta caretta</i>
Green sea turtle	<i>Chelonia mydas</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>
Kemp's Ridley sea turtle	<i>Lepidochelys kempi</i>
Northern diamond-backed	
Terrapin	<i>Malaclemys terrapin</i>

#### Salamanders

Red-backed salamander	<i>Plethodon cinereus</i>
Red-spotted newt	<i>Notophthalmus viridescens</i>

#### Lizards

Little brown skink	<i>Scincella lateralis</i>
Broad-headed skink	<i>Eumeces laticeps</i>
Northern fence lizard	<i>Sceloporus undulatus hyacinthinus</i>
Five-lined skink	<i>Eumeces fasciatus</i>

**Snakes**

Northern black racer	<i>Coluber constrictor</i>
Black rat snake	<i>Elaphe obsoleta</i>
Eastern hognose snake	<i>Heterodon platirhinos</i>
Common kingsnake	<i>Lampropeltis getula</i>
Northern watersnake	<i>Nerodia sipedon</i>
Rough greensnake	<i>Opheodrys aestivus</i>
Northern brownsnake	<i>Storeria dekayi</i>
Eastern ribbonsnake	<i>Thamnophis sauritus</i>
Eastern gartersnake	<i>Thamnophis sirtalis</i>
Northern copperhead	<i>Agkistrodon contortrix mokasen</i>
Eastern wormsnake	<i>Carphophis amoenus</i>

**Mammals of the Eastern Shore of Virginia and Fisherman Island Refuges**

White-tailed deer	<i>Odocoileus virginianus</i>
Coyote	<i>Canis latrans</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Red fox	<i>Vulpes vulpes</i>
Raccoon	<i>Procyon lotor</i>
River otter	<i>Lutra canadensis</i>
American mink	<i>Mustela vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Hutchen's cottontail	<i>Sylvilagus floridanus hutchensi</i> (likely extirpated)
Virginia opossum	<i>Didelphis virginiana</i>
Southern flying squirrel	<i>Glaucomys volans</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Marsh rice rat	<i>Oryzomys palustris</i>
Norway rat	<i>Rattus norvegicus</i>
Black rat	<i>Rattus rattus</i>
Meadow vole	<i>Microtus pennsylvanicus</i>
Pine vole	<i>Microtus pinetorum</i>
Northern short-tailed shrew	<i>Blarina brevicauda</i>
Least shrew	<i>Cryptotis parva</i>
Star-nosed mole	<i>Condylura cristata</i>
Eastern mole	<i>Scalopus aquaticus</i>
white-footed mouse	<i>Peromyscus leucopus</i>
meadow jumping mouse	<i>Zapus hudsonicus</i>
house mouse	<i>Mus musculus</i>
big brown bat	<i>Eptesicus fuscus</i>
silver-haired bat	<i>Lasionycteris noctivagans</i>
Eastern red bat	<i>Lasius borealis</i>
hoary bat	<i>Lasiurus cinereus</i>
little brown myotis	<i>Myotis lucifugus</i>
Northern myotis	<i>Myotis septentrionalis</i>
Eastern pipistrella	<i>Pipistrella subflavus</i>
evening bat	<i>Nycticeius humeralis</i>

**Marine mammals**

Harbor Seal	<i>Phoca vitulina</i>
Fin-backed Whale	<i>Balaenoptera physalus</i>
Sei Whale	<i>Balaenoptera borealis</i>

Humpback Whale  
Atlantic Right Whale

*Megaptera novaeangliae*  
*Balaena glacialis*

### Butterflies and Skippers of the Eastern Shore of Virginia and Fisherman Island Refuges

Giant Swallowtail	<i>Papilio cresphontes</i>
Eastern Tiger Swallowtail	<i>Papilio glaucus</i>
Spicebush Swallowtail	<i>Papilio troilus</i>
Black Swallowtail	<i>Papilio polyxenes</i>
Palamedes Swallowtail	<i>Papilio palamedes</i>
Pipevine Swallowtail	<i>Battus philenor</i>
Cabbage White	<i>Pieris rapae</i>
Falcate Orange-tip	<i>Anthocharis midea</i>
Clouded (Common) Sulphur	<i>Colias philodice</i>
Orange Sulphur	<i>Colias eurytheme</i>
Cloudless Giant Sulphur	<i>Phoebis sennae</i>
Little Yellow	<i>Eurema lisa</i>
Sleepy Orange	<i>Eurema nicippe</i>
American Copper	<i>Lycaena phlaeas</i>
Red-banded Hairstreak	<i>Calycopis cecrops</i>
Gray Hairstreak	<i>Strymon melinus</i>
Eastern Tailed Blue	<i>Everes comyntas</i>
Spring Azure	<i>Celastrina ariolus</i>
Brown Elfin	<i>Incisalia augustinus</i>
Frosted Elfin	<i>Incisalia irus</i>
Eastern Pine Elfin	<i>Incisalia niphon</i>
Snout Butterfly	<i>Libytheana carinenta</i>
Gulf Fritillary	<i>Agraulis vanillae</i>
Variegated Fritillary	<i>Euptoieta claudia</i>
Pearl Crescent	<i>Phciodes tharos</i>
Question Mark	<i>Polygonia interrogationis</i>
Comma	<i>Polygonia comma</i>
Mourning Cloak	<i>Nymphalis antiopa</i>
American Lady	<i>Vanessa virginiensis</i>
Painted Lady	<i>Vanessa cardui</i>
Red Admiral	<i>Vanessa atalanta</i>
Buckeye	<i>Junonia coenia</i>
Red-spotted Purple	<i>Lentitis arthemis astyanax</i>
Viceroy	<i>Limenitis archippus</i>
Hackberry Butterfly	<i>Asterocampa celtis</i>
Tawny Emperor	<i>Asterocampa clyton</i>
Little Wood Satyr	<i>Megisto cymela</i>
Large Wood Nymph	<i>Cercyonis pegala</i>
Monarch	<i>Danaus plexippus</i>
Silver-spotted Skipper	<i>Epargyreus clarus</i>
Long-tailed Skipper	<i>Urbanus proteus</i>
Juvenal's Duskywing	<i>Erynnis juvenalis</i>
Horace's Duskywing	<i>Erynnis horatius</i>
Wild Indigo Duskywing	<i>Erynnis baptisiae</i>
Checkered Skipper	<i>Pyrgus communis</i>
Common Sootywing	<i>Pholisora catullus</i>
Swarthy Skipper	<i>Nastra Iherminier</i>
Clouded Skipper	<i>Lerema accius</i>

Least Skipper	<i>Ancyloxypha numitor</i>
Fiery Skipper	<i>Hylephila phyleus</i>
Tawny-edged Skipper	<i>Polites themistocles</i>
Crossline Skipper	<i>Polites origenes</i>
Southern Broken Dash	<i>Wallengrenia otho</i>
Northern Broken Dash	<i>Wallengrenia egeremet</i>
Little Glassywing	<i>Pompeius verna</i>
Sachem	<i>Atalopedes campestris</i>
Zabulon Skipper	<i>Poanes zabulon</i>
Aaron's Skipper	<i>Poanes aaroni</i>
Broad-winged Skipper	<i>Poanes viator</i>
Dun Skipper	<i>Euphyes vestris</i>
Common Roadside Skipper	<i>Amblyscirtes vialis</i>
Saltmarsh Skipper	<i>Panoquina panoquin</i>
Long-winged (Ocola) Skipper	<i>Panoquina ocola</i>

# Glossary

## Glossary of Terms

**accretion** – slow addition to land by deposition of water-borne sediment.

**agricultural land** – nonforested land, due to its current or recent use for orchards, pasture, hay or crops.

**alternative** – a reasonable way to fix the identified problem or satisfy the stated need (40 CFR 1500.2) [see also management alternative below].

**biological or natural diversity** – the variety of life in all its forms.

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

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

**CFR** – Code of Federal Regulations.

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

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

**compatibility determination** – a compatible use is one which, in the sound professional judgement of the Refuge Manager, will not materially interfere with or detract from fulfillment of the Refuge System mission or refuge purpose(s).

**concern** – see Issue.

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

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

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

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

**cultural resource overview** – a comprehensive document prepared for a field office that discusses, among other things, its prehistory and cultural history, the nature and extent of known cultural re-



sources, previous research, management objectives, resource management conflicts or issues, and a general statement on how program objectives should be met and conflicts resolved. An overview should reference or incorporate information from a field offices background or literature search described in Section VIII. of the Cultural Resource Management Handbook (Service Manual 614 FW 1.7).

**database** – a collection of data arranged for ease and speed of analysis and retrieval, usually computerized.

**designated wilderness area** – an area designated by the United States Congress to be managed as part of the National Wilderness Preservation System (Draft Service Manual 610 FW 1.5).

**digitizing** – the process of converting information from paper maps into geographically referenced electronic files for a geographic information system (GIS).

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

**ecosystem** – a natural community of organisms interacting with its physical environment, regarded as a unit.

**ecotourism** – a type of tourism that maintains and preserves natural resources as a basis for promoting economic growth and development resulting from visitation to an area.

**ecosystem approach** – a way of looking at socio-economic and environmental information based on the boundaries of ecosystems rather than based on town, city, and county boundaries.

**emergent wetland** – wetlands dominated by erect, rooted, herbaceous plants.

**endangered species** – a federally protected species which is in danger of extinction throughout all or a significant portion of its range.

**environmental education** – education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

**Environmental Assessment (EA)** – A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**Environmental Impact Statement (EIS)** – A detailed written statement required by section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).

**exemplary community type** – an outstanding example of a particular community type.

**extirpated** – no longer occurring in a given geographic area.

**Federal land** – public land owned by the Federal government, including lands such as National Forests,

National Parks and National Wildlife Refuges.

**Federal-listed species** – a species listed under the federal Endangered Species Act of 1973, as amended, either as endangered, threatened or species at risk (formerly candidate species).

**Finding of No Significant Impact (FONSI)** – A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a Federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared (40 CFR 1508.13).

**forbs** – A flowering plant, excluding grasses, sedges, and rushes, that does not have a woody stem and dies back to the ground at the end of the growing season.

**forested land** – land dominated by trees. For the purposes of the impacts analysis in this document, all forested land was assumed to have the potential to be occasionally harvested, and forested land owned by timber companies was assumed to be harvested on a more intensive, regular schedule.

**forested wetlands** – wetlands dominated by trees.

**geographic information system (GIS)** – a computerized system used to compile, store, analyze and display geographically referenced information. Can be used to overlay information layers containing the distributions of a variety of biological and physical features.

**habitat fragmentation** – breaking up of a specific habitat into smaller unconnected areas. A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.

**habitat conservation** – the protection of an animal or plant's habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.

**habitat** – the place where a particular type of plant or animal lives. An organism's habitat must provide all of the basic requirements for life and should be free of harmful contaminants.

**interjurisdictional fish** – populations of fish that are managed by two or more states or national or tribal governments because of the scope of their geographic distributions or migrations.

**interpretive facilities** – structures that provides information about an event, place or thing by a variety of means including printed materials, audiovisuals or multimedia materials. Examples of these would be kiosks which offer printed materials and audiovisuals, signs and trailheads.

**interpretive materials** – any tool used to provide or clarify information, explain events or things, or serve to increase awareness and understanding of the events or things. Examples of these would be: (1) printed materials such as brochures, maps or curriculum materials; (2) audio/visual materials such as videotapes, films, slides, or audio tapes; and (3) interactive multimedia materials, such as cd-rom and other computer technology.

**issue** – any unsettled matter that requires a management decision; e.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concerns, or the presence of an undesirable resource condition. Issues should be documented, described, and analyzed in the CMP even if resolution cannot be accomplished during the planning process (Service Manual 602 FW 1.4).

**land trusts** – organizations dedicated to conserving land by purchasing land, receiving donations of lands, or accepting conservation easements from landowners.

**local land** – public land owned by local governments, including community or county parks, or municipal watersheds.

**local agencies** – generally referring to municipal governments, regional planning commissions or conservation groups.

**long term protection** – mechanisms such as fee title acquisition, conservation easements or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintenance of the species population at the site.

**management alternative** – a set of objectives and the strategies needed to accomplish each objective (Service Manual 602 FW 1.4).

**management concern** – see Issue.

**management opportunity** – see Issue.

**management plan** – a plan that guides future land management practices on a tract of land.

**management strategy** – a general approach to meet unit objectives. A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (Service Manual 602 FW 1.4).

**mission statement** – succinct statement of the unit's purpose and reason for being.

**mitigation** – actions taken to compensate for the negative effects of a particular project. Wetland mitigation usually takes the form of restoration or enhancement of a previously damaged wetland or creation of a new wetland.

**National Environmental Policy Act of 1969 (NEPA)** – requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision making (from 40 CFR 1500).

**National Wildlife Refuge System** – all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction.

**native plant** – a plant that has grown in the region since the last glaciation and occurred before European settlement.

**non-point source pollution** – nutrients or toxic substances that enter water from dispersed and uncontrolled sites.

**Notice of Intent (NOI)** – a notice that an environmental impact statement will be prepared and considered (40 CFR 1508.22). Published in the Federal Register.

**outdoor education projects** – any cooperative ventures that combine the financial and staff resources to develop and implement outdoor education activities such as labs, field trips, surveys, or monitoring/sampling efforts.

**outdoor education** – educational activities that take place in an outdoor setting.

**Partners for Wildlife Program** – a voluntary habitat restoration program undertaken by the Fish and Wildlife Service in cooperation with other governmental agencies, public and private organizations, and private landowners to improve and protect fish and wildlife habitat on private lands while leaving the land in private ownership.

**partnership** – a contract or agreement entered into by two or more individuals, groups of individuals, organizations or agencies in which each agrees to furnish a part of the capital or some in-kind service, i.e., labor, for a mutually beneficial enterprise.

**payment in lieu of taxes** – see Revenue Sharing Act of 1935, Chapter One, Legal Context.

**planning area** – The area upon which the planning effort will focus. A planning area may include lands outside existing planning unit boundaries currently studied for inclusion in the Refuge System and/or partnership planning efforts. It may also include watersheds or ecosystems outside of our jurisdiction that affect the planning unit.

**population monitoring** – assessments of the characteristics of populations to ascertain their status and establish trends related to their abundance, condition, distribution, or other characteristics.

**prescribed fire** – the application of fire to wildland fuels to achieve identified land use objectives (Service Manual 621 FW 1.7), either from natural or intentional ignition.

**private land** – land that is owned by a private individual, group of individuals, or non-governmental organization.

**private landowner** – any individual, group of individuals or non-governmental organization that owns land.

**private organization** – any non-governmental organization.

**public involvement** – a process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.

**public involvement plan** – broad long term guidance for involving the public in the comprehensive planning process.

**public land** – land that is owned by the local, state, or Federal government.

**rare species** – species identified in Appendix A as Species of Special Emphasis due to their uncommon occurrence within the planning area.

**rare community types** – plant community types classified as rare by any of the four state Natural Heritage Programs. The types are listed in Appendix A.

**refuge goals** – descriptive, open-ended and often broad statements of desired future conditions that convey a purpose but do not define measurable units.

**refuge purposes** – the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, a refuge unit, or refuge subunit, and any subsequent modification of the original establishing authority for additional conservation purposes (Service Manual 602 FW 1.4).

**refuge lands** – those lands in which the Service holds full interest in fee title, or partial interest such as easements.

**restoration** – the artificial manipulation of a habitat to restore it to its former condition. Involves taking a degraded grassland and re-establishing habitat for native plants and animals. Restoration usually involves the planting of native grasses and forbs, and may include shrub removal and prescribed burning.

**species at risk** – a species being considered for listing as a federally endangered or threatened species.

**species of concern** – a species not on the federal list of threatened or endangered species, but a species for which the Service or one of its partners has concerns.

**state land** – public land owned by a state such as state parks or state wildlife management areas.

**state agencies** – generally referring to natural resource arms of the state governments of Virginia.

**step-down management plans** – step-down management plans describe management strategies and implementation schedules. Step-down management plans are a series of plans dealing with specific management subjects (e.g., croplands, wilderness, and fire) (Service Manual 602 FW 1.4).

**stopover habitat** – habitat used during bird migration for rest and feeding.

**threatened species** – a federally protected species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

**trust resource** – one that through law or administrative act is held in trust for the people by the government. A federal trust resource is one for which trust responsibility is given in part to the federal government through federal legislation or administrative act. Generally, federal trust resources are those considered to be of national or international importance no matter where they occur, such as endangered species and species such as migratory birds and fish that regularly move across state lines. In addition to species, trust resources include cultural resources protected through federal historic preservation laws, nationally important and threatened habitats, notably wetlands, navigable waters, and public lands such as state parks and national wildlife refuges.

**unfragmented habitat** – large blocks of unbroken habitat of a particular type.

**upland** – dry ground; other than wetlands.

**vision statement** – concise statement of what the planning unit should be, or what we hope to do, based primarily upon the Refuge System mission and specific refuge purposes, and other mandates (Service Manual, 602 FW 1.5).

**warm-season grass** – native prairie grass that puts on the most growth during summer when cool-season grasses are dormant.

**wetlands** – The U.S. Fish and Wildlife Service’s definition of wetlands states that “Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.” (Cowardin et al 1979)

**wilderness** – see designated wilderness.

**wildlife management** – the practice of manipulating wildlife populations, either directly through regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

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