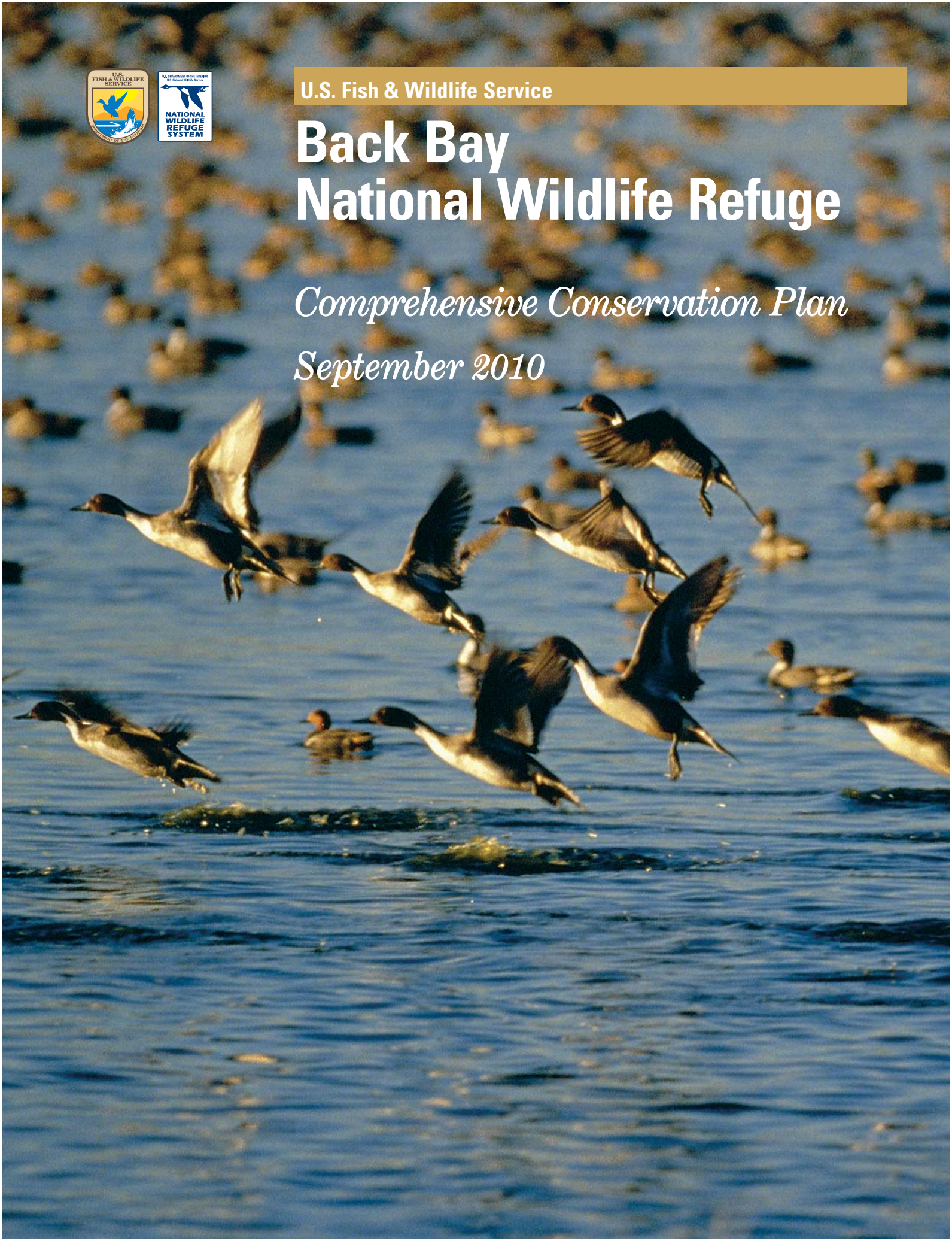

U.S. Fish & Wildlife Service

Back Bay National Wildlife Refuge

Comprehensive Conservation Plan

September 2010

Front and back covers:

Northern pintails
USFWS



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

The *U.S. Fish and Wildlife Service* is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the 150-million acre National Wildlife Refuge System comprised of more than 550 national wildlife refuges and thousands of waterfowl production areas. It also operates 70 national fish hatcheries and 81 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 Assistance Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

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

U.S. Fish & Wildlife Service

Back Bay National Wildlife Refuge

Comprehensive Conservation Plan
September 2010

Submitted by:

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Project Leader
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9/1/2010
Date

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09/16/2010
Date

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Acting Marvin E. Moriarty
Regional Director, Region 5

9/30/10
Date

Back Bay National Wildlife Refuge

Comprehensive Conservation Plan

September 2010

Abstract

Type of Action: Administrative—Development of a Comprehensive Conservation Plan

Lead Agency: U.S. Department of the Interior, Fish and Wildlife Service

Location: Back Bay National Wildlife Refuge
Virginia Beach, VA

Administrative Headquarters: Back Bay National Wildlife Refuge
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This Comprehensive Conservation Plan (CCP) for the 9,120 acre Back Bay National Wildlife Refuge is the culmination of a planning effort involving several Virginia state agencies, local partners, refuge neighbors, private landowners, the Back Bay Restoration Foundation, and the local community. This CCP establishes 15-year management goals and objectives for wildlife and habitats, public use, and administration and facilities.

Under this plan, we will enhance the conservation of wildlife through habitat management, as well as providing additional visitor opportunities on the Refuge. Public use would be improved through activities such as the expansion of the deer hunt, new hiking trails, and new, medium-sized headquarters/visitor contact station (HQ/VCS) at a new location.

U.S. Fish & Wildlife Service

Back Bay National Wildlife Refuge

Comprehensive Conservation Plan

September 2010

Refuge Vision Statement

Back Bay National Wildlife Refuge will work closely with partners and communities to provide a biologically healthy natural environment that restores abundant fish, wildlife and plant populations. Special consideration will be given to those species whose survival is in jeopardy.

In keeping with the Refuge mission, we will provide a healthy haven of land and water to support Back Bay's diverse wildlife communities, with an emphasis on migratory waterbird and songbird management. We will strive to promote active stewardship of these natural resources for present and future generations, while also providing opportunities for compatible public uses. In doing this, we hope to ensure a sound coexistence between wildlife and people that will allow people to share our passion and appreciation of Back Bay's many natural resources, while also enhancing the quality of life in Back Bay.

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Chapter 1



USFWS

Male Northern pintail

Introduction

- Introduction
- Purpose of and Need for Action
- Regional Context
- The Service, its Policies and Legal Mandates
- Conservation Plans and Initiatives Guiding the Project
- Refuge Establishment/History and Purpose
- Refuge Goals

Introduction

The purposes for establishing the Back Bay National Wildlife Refuge (Refuge) are to serve as a breeding ground and as an inviolate sanctuary for migratory birds, to conserve and protect other wildlife including endangered and threatened species and wetlands. Refuge habitats include a diversity of wetlands. barrier sand dunes, open water, and upland woodlands.

This Comprehensive Conservation Plan (CCP) for the Back Bay National Wildlife Refuge was prepared pursuant to the required National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 6688dd, et seq.; Refuge Improvement Act). An environmental asssessment (EA), required by the National Environmental Policy Act of 1969 (NEPA), was prepared with the draft CCP. The CCP will serve as a guide for the Refuge's management over the next 15 years.

This chapter:

- explains the purpose of and need for preparing a CCP for Back Bay National Wildlife Refuge;
- identifies national and regional mandates and plans that influenced this document;
- presents the vision and goals for the Refuge;
- explains the planning process and how it is used to develop this document;
- describes the issues and concerns addressed during the planning process

Chapter 2, "Refuge Resources," describes the physical, biological, and human environment of the Refuge.

Chapter 4, "Management Direction and Implementation," presents the goals, objectives, strategies, and ctions that will guide our decision-making and land management. It also outlines the staffing and funding needed to accomplish that management.

Chapter 5, "Consultation and Coordination with Others," describes the public and partner involvement used throughout the planning process, and identifies those individuals involved in preparing this document.

Also included in this document, is a glossary of terms, a bibliography and seven appendices.

The Purpose of and Need for Action

We developed a CCP for the Refuge that best meets its primary purpose, goals and objectives, contributes to the mission of the National Wildlife Refuge System, abides by the U.S. Fish and Wildlife Service policies and mandates, addresses key issues, responds to public concerns, and incorporates sound principles of fish and wildlife science.

Developing a CCP with partner and public involvement is vital to the success of management at every National Wildlife Refuge. The purpose of a CCP is to provide management direction for the next 15 years, by:

- stating clearly the desired future conditions of Refuge habitat, wildlife, visitor services, staffing, and facilities;

- providing State agencies, Refuge neighbors, visitors and partners with a clear understanding of the reasons for Refuge management actions;
- ensuring that Refuge management reflects the policies, legal mandates and the mission of the National Wildlife Refuge System;
- ensuring the appropriateness and compatibility of current and future public use meets Refuge purposes;
- providing long-term continuity in Refuge management; and,
- providing direction for our staffing, operating and maintenance, and annual budget requests.

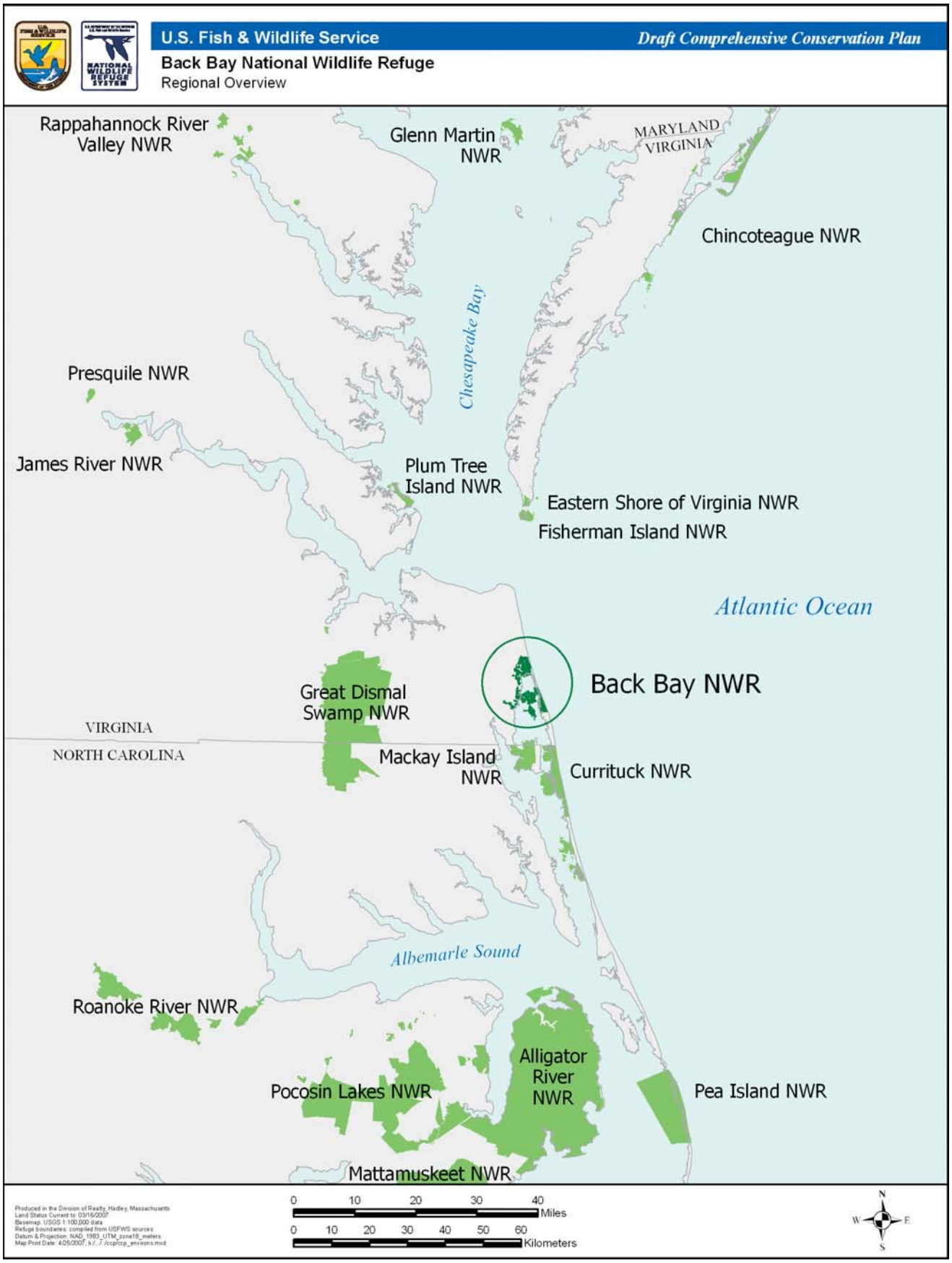
The need for this CCP is two-fold. First, there is currently no master plan to formally establish and ensure strategic management for the Refuge. A vision statement, goals, objectives and management strategies are all necessary for successful Refuge management. Public and partner involvement throughout the planning process will also help to resolve various management issues. Second, the National Wildlife Refuge System Improvement Act of 1997 requires that all National Wildlife Refuges have a CCP by 2012.

Regional Context

The 9,120-acre Refuge is located in southeastern Virginia along the Atlantic Ocean and within the southern half of the city limits of Virginia Beach (Map 1-1). The City of Virginia Beach is bounded to the east by the Atlantic Ocean, to the south by Currituck County and North Carolina, to the west by the cities of Chesapeake and Norfolk, Virginia, and to the north by the Chesapeake Bay. Land use patterns divide the City into three sections. The northern section is the higher density urban and residential region. The southern section is the rural region. The mid-section or "Transition Zone," provides a mixed density transition between the urban north and rural south. The boundary between the urban north and Transition Zone is known as the "Green Line." Currituck Sound lies south of the City, with North Landing River and Back Bay being the primary water sources. The City of Virginia Beach is one of the biggest resort cities on the Atlantic coast and continues to expand as area tourism grows and the resident population continues to increase.

The Refuge exists within the Back Bay Watershed. It currently makes up roughly 25% of the watershed. The watershed has been defined as an oligohaline (nearly fresh) estuary (Norman 1990). The usual salinity of Refuge waters ranges from 0-3 parts per thousand (ppt). Back Bay is the northern tip of the Environmental Protection Agency (EPA)-recognized Albemarle-Pamlico National Estuarine System (APES). Most of APES runs south into coastal North Carolina, and consists of Currituck Sound, Albemarle Sound and Pamlico Sound and associated waterways. Because of its location, 80 miles north of the nearest ocean inlet (Oregon Inlet, NC), Back Bay experiences no lunar tidal action. Instead, the watershed experiences "wind tides" that keep Bay water levels high or low for prolonged periods, in keeping with the prevailing wind direction and speed. These wind tides, when coupled with precipitation and input from the watershed, determine salinity levels of Back Bay waters.

The Refuge consists mostly of open water, barrier island beach and sand dunes, shrub-scrub, bottomland and upland forests/woodlands, and emergent marshes. The immediate surrounding environment is residential, rural agriculture, barrier dunes, inland water, and ocean front. The area just north of the Refuge is urban. The Refuge's unique location mid-way along the Atlantic Coast provides for a high diversity of plant and animal species, because southeastern Virginia and northeastern North Carolina sustain both northern and southern species at their geographic range limits.


U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Regional Overview
Rappahannock River Valley NWR
Glenn Martin NWR
MARYLAND
VIRGINIA
Chincoteague NWR
Chesapeake Bay
Presquile NWR
James River NWR
Plum Tree Island NWR
Eastern Shore of Virginia NWR
Fisherman Island NWR
Atlantic Ocean
Back Bay NWR
Great Dismal Swamp NWR
VIRGINIA
NORTH CAROLINA
Mackay Island NWR
Currituck NWR
Albemarle Sound
Roanoke River NWR
Alligator River NWR
Pocosin Lakes NWR
Pea Island NWR
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This section presents the Service, the National Wildlife Refuge System, Service policy, regulations, and mandates that directly influenced the development of this draft CCP/EA.

The Service, its Policies and Legal Mandates

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

The U.S. Fish and Wildlife Service administers the National Wildlife Refuge System. The Service is an agency within the Department of the Interior. The Service mission is:

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

Congress entrusts natural resources to the Service for conservation and protection. These include migratory birds, Federal-listed endangered or threatened species, interjurisdictional fish, wetlands, certain marine mammals, and National Wildlife Refuges. The Service also enforces Federal wildlife laws and international treaties on importing and exporting wildlife, assists States with their fish and wildlife programs, and helps other countries develop conservation programs. Under the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884, as amended), we have consulted with the Service's Ecological Service Virginia Field Office to ensure that actions identified in this CCP do not jeopardize the continued existence of listed species or adversely modify critical habitat. The Intra-Service Section 7 Biological Evaluation Form is included as Appendix F.

The Service manual contains the standing and continuing directives to implement its authorities, responsibilities, and activities. You can view this manual at: http://www.fws.gov.directives/direct.html.

Special Service directives that affect the rights of citizens or the authorities of other agencies are published separately in the Code of Federal Regulations (CFR). Most of the current regulations that pertain to the Service are issued in 50 CFR parts 1 to 99. CFR's can be viewed at: http://www.access.gpo.gov/nara/cfr/index.html.

The National Wildlife Refuge System, its Mission, and Policies

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 Pelican Island, a pelican and heron rookery in Florida, as a bird sanctuary. Today, more than 545 National Wildlife Refuges are part of the National Wildlife Refuge System. They encompass more than 95 million acres of lands and waters in all 50 states and several island territories. Over 40 million visitors hunt, fish, observe and photograph wildlife, or participate in environmental education and interpretive activities on Refuges across the nation each year.

In 1997, the National Wildlife Refuge System Improvement Act was passed. This law established a unifying mission for the Refuge System, a new process for determining compatible public use activities on the Refuges, and the requirement to prepare CCPs for each Refuge. The Refuge Improvement Act states first and foremost, that 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."*
>
> —Refuge Improvement Act; 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 will receive priority consideration on refuges and in CCPs. The Act also declares that all existing or proposed refuge uses must be "compatible" with the refuge's purpose and consistent with public safety. The refuge manager determines if an existing or proposed use is "compatible" by evaluating its potential impact on refuge resources, insuring that the use supports the System mission, and does not materially interfere with or detract from the purpose for which the refuge was established.

The Refuge System manual provides a central reference for current policy governing the operation and management of the Refuge System not covered by the Service manual, including technical information on implementing Refuge policies and guidelines. This manual can be reviewed at Refuge Headquarters.

Refuge System Planning Policy
The planning policy provides guidance, systematic direction, and minimum requirements for developing all CCPs and step-down management plans, and provides a systematic decision-making process that fulfills those requirements. It states that we will manage all Refuges in accordance with an approved CCP, which when implemented, will achieve Refuge purposes; help fulfill the Refuge System mission; maintain and, where appropriate, restore the ecological integrity of each Refuge and the Refuge System; help achieve the goals of the National Wilderness Preservation System; and meet other mandates [Fish and Wildlife Service Manual (602 FW 1,2,3)].

The Improvement Act of 1997 stipulates that each Comprehensive Conservation Plan "shall identify and describe:

A) the purposes of each refuge comprising the planning unit [*found in this chapter*];

B) the distribution, migration patterns, and abundance of fish, wildlife, and plant populations and related habitats within the planning unit [*Chapter 3, Affected Environment*];

C) the archaeological and cultural values of the planning unit [*Chapter 3*];

D) such areas within the planning unit that are suitable for use as administrative sites or visitor facilities [*Chapter 2, Alternatives*];

E) significant problems that may adversely affect the populations and habitats of fish, wildlife, and plants within the planning unit and the actions necessary to correct or mitigate such problems [*Chapters 1,2 and 3*]; and

F) opportunities for compatible wildlife-dependent recreational uses [*Chapter 2*]."

Appropriate Refuge Uses Policy
This policy provides a national framework and procedure for refuge managers to follow when deciding if uses are appropriate on a refuge. It also clarifies and expands on the compatibility policy (603 FW 2.10D), which describes when refuge managers should deny a proposed use without determining compatibility. When we find a use is appropriate, we must then determine if the use is compatible before we allow it on a refuge. This policy applies to all proposed and existing

uses in the Refuge System only when we have jurisdiction over the use and does not apply to refuge management activities or situations where reserved rights or legal mandates provide we must allow certain uses (603 FW 1). Appendix A further describes the Appropriate Refuge Uses Policy and describes its relationship to the CCP process.

Compatibility Policy
Federal law and Service policy provide the direction and planning framework to protect the Refuge System from incompatible or harmful human activities and ensure that Americans can enjoy Refuge System lands and waters. The Refuge Improvement Act is the key legislation regarding management of public uses and compatibility. The compatibility requirements of the Refuge Improvement Act were adopted in the USFWS Final Compatibility Regulations and Final Compatibility Policy, published October 18, 2000 (Federal Register, Vol. 65, No. 202, pp. 62458 to 62496). This Compatibility Rule changed or modified Service regulations contained in Chapter 50, Parts 25, 26, and 29 of the Code of Federal Regulations (USFWS 2000). The compatibility determinations for Back Bay Refuge can be found in Appendix A along with additional information on the process. To view the policy and regulations online, visit *http://policy.fws.gov/library/00fr62483.pdf.*

Wildlife-Dependent Recreation Policy
The Improvement Act defines and establishes that compatible wildlife dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) are the priority general public uses of the Refuge System and will receive enhanced and priority consideration in refuge planning and management over other general public uses. The Wildlife Dependent Recreation Policy explains how we will provide visitors with opportunities for those priority public uses on units of the Refuge System and how we will facilitate these uses. We are incorporating this policy as Part 605, Chapters 1 to 7, of the Fish and Wildlife Service Manual.

Maintaining Biological Integrity, Diversity and Environmental Health Policy
This policy provides guidance on maintaining or restoring the biological integrity, diversity and environmental health of the Refuge System including the protection of a broad spectrum of fish, wildlife and habitat resources found in Refuge ecosystems. Refuge managers are provided with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and restore lost or severely degraded environmental components. Guidelines are also provided for dealing with external threats to the biological integrity, diversity and environmental health of a Refuge and its ecosystem (601 FW 3).

Fulfilling the Promise
The 1999 report, "Fulfilling the Promise, The National Wildlife Refuge System; Visions for Wildlife, Habitat, People and Leadership" (USFWS 1999a), is a culmination of a year-long process by teams of Service employees to create a vision for the Refuge System nation-wide. This report was a result of the first-ever System Conference held in Keystone, Colorado in October 1998. It was attended by every Refuge manager in the country, other Service employees, and scores of conservation organizations. The report contains 42 recommendations packaged with three vision statements dealing with wildlife and habitat, people, and leadership. We have often looked to the recommendations in the document for guidance when writing this draft CCP/EA. For example, the 1999 report recommends forging new alliances through citizen and community partnerships, and strengthening partnerships with the business community. One of the goals in our CCP is devoted almost entirely to the development of community partnerships, while several of our strategies focus on forging new partnerships or strengthening existing ones.

Other Mandates

Although Service and Refuge System policy and the Refuge's purposes provide foundation for its management, other federal laws, executive orders, treaties, interstate compacts, and regulations on the conservation and protection of natural and cultural resources also affect how National Wildlife Refuges are managed. The Digest of Federal Resource Laws of Interest to the USFWS lists many of them, and can be accessed at: *http://law.fws.gov/lawsdigest/indx.html.*

Conservation Plans and Initiatives Guiding the Project

North American Waterfowl Management Plan (NAWMP; update 2004)

The North American Waterfowl Management Plan was originally written in 1986 and envisioned a 15-year effort to achieve landscape conditions that could sustain waterfowl populations. This plan outlined a strategy among the United States, Canada, and Mexico to protect North America's remaining wetlands and to restore waterfowl populations through habitat protection, restoration, and enhancement. The 2004 Plan establishes a new 15-year planning horizon for waterfowl conservation in North America by assessing the needs, priorities, and strategies required to guide waterfowl conservation in the 21st century. The 2004 update for the North American Waterfowl Management Plan can be accessed at: *http://www.fws.gov/birdhabitat/NAWMP/images/NAWMP2004.pdf*

Implementation of this plan is accomplished at the regional level within 15 regional habitat "Joint Venture" areas. A "joint venture" is a self-directed partnership of agencies, organizations, corporations, tribes, or individuals that has formally accepted the responsibility of implementing national or international bird conservation plans within a specific geographic area or for a specific taxonomic group, and has received general acceptance in the bird conservation community for such responsibility. In support of bird conservation goals, joint venture partners conduct biological planning, project development and implementation, monitoring and evaluation, and communications and outreach. Back Bay National Wildlife Refuge is located within the Atlantic Coast Joint Venture (ACJV) area, which covers all the Atlantic Flyway states from Maine to Florida and Puerto Rico. The goal for the ACJV 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."*

The ACJV Implementation Plan was revised in 2005 (USFWS 2005). It steps down continental and regional waterfowl population and habitat goals from the NAWMP 2004 Update to the ACJV area. It presents habitat conservation goals and population indices for the ACJV consistent with the 2004 Update, provides current status assessments for waterfowl and their habitats in the joint venture, and updates focus area narratives and maps for each state. This revised version of the Implementation Plan also provides a baseline of information needed to move forward with a thorough approach for setting future habitat goals. Back Bay National Wildlife Refuge lies within the Southeast Virginia Focus Area, one of eight focus areas in Virginia, within which the plan designates 30,097 acres of habitat to be protected and 6,019 acres for enhancement. The 2005 update of the Implementation Plan can be accessed at: *http://www.acjv.org/wip/acjv_wip_main.pdf*

Partners in Flight: Mid-Atlantic Coastal Plain Bird Conservation Plan (Physiographic Area #44)

The Partners in Flight (PIF) Program has developed a draft plan for the Mid-Atlantic Coastal Plain Physiographic Area (USFWS 1999b). According to the plan, the greatest conservation challenge facing land managers today is increasing population growth. 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 habitats. We use components of this plan to guide bird management on the Refuge. The plan ranks species conservation importance within a regional area based on a variety of factors including global threats to the species, high concern for regional or local populations, or responsibility for conserving large or important populations of the species. Examples of high priority species at Back Bay National Wildlife Refuge include the piping plover, American black duck, king rail, least bittern, bald eagle, seaside sparrow, field sparrow, Henslow's sparrow, prothonotary warbler, prairie warbler and wood thrush. The PIF draft plan also ranks habitats based on overall conservation priority. Six of the eight habitat types identified in the plan are found on the Refuge. Those six habitat types include: early successional, forested wetland, pine savannah, beach and barrier dunes, mixed upland forest and fresh/oligohaline marsh. The Mid-Atlantic Coast Plain Bird Conservation Plan can be accessed at: *http://www.blm.gov/wildlife/pl_44sum.htm*

U.S. Shorebird Conservation Plan

The United States Conservation Plan (Brown et al. 2001) was developed with the purpose of creating conservation goals, identifying critical habitat and promoting education and outreach programs to facilitate shorebird conservation. Several groups and individuals, including local, state, and federal agencies, non-governmental organizations, business-related sectors, researchers, educators, and policy makers helped with the development of this plan. The plan has set goals at the hemispheric, national and regional levels. At the regional level, Back Bay National Wildlife Refuge is part of the Southeastern Coastal Plain/Piedmont Planning Region (SECPR). The Southeastern Coastal Plains/Piedmont Region is critical for breeding shorebirds as well as for supporting transient species during both northbound and southbound migrations. Species of highest regional priority that occasionally use Back Bay NWR include: the American oystercatcher, Wilson's plover, and piping plover. High regional priority species include: the pectoral sandpiper, red knot, semipalmated sandpiper and short-billed dowitcher. Three habitat goals under the Conservation Plan are: (1) to provide optimal breeding habitat to maintain and increase populations of priority species, (2) to provide high quality habitat to support requirements of species migrating through or spending winter in the region, and (3) to restrain human disturbance to tolerable levels. Proposed strategies within the CCP address these habitat goals as well as protect those high priority species mentioned above. The U.S. Shorebird Conservation Plan can be accessed at: *http://www.fws.gov/shorebirdplan/USShorebird/downloads/USShorebirdPlan2Ed.pdf*

If you would like to view the SECPR Plan, please visit: *http://www.fws.gov/shorebirdplan/RegionalShorebird/downloads/SECPCRRev02.pdf*

The Neotropical Migratory Songbird Coastal Corridor Study

This study examined the distribution and habitat associations of fall migrating landbirds within the coastal regions of four states along the Atlantic Coast (Mabey et al. 1993). These states include: New Jersey, Delaware, Maryland and Virginia. Together, these states make up the Cape May and Delmarva peninsulas. These two areas are well known for their contribution of stopover habitat for migratory birds. The study revealed that neotropical migrants are not randomly or evenly distributed over the Cape May and Delmarva peninsula during stop-over, but rather are concentrated in particular geographic areas within the region. More specifically the study suggested that migrant birds are more abundant in areas close to the coastlines (within 0 to 0.9 miles) than they are in equivalent areas farther from the coast. The study also revealed that migrants are associated with particular habitats on a species-specific basis. This study has shaped some of our strategies within Alternative B. For example, we intend to focus some of our research efforts on studying the use of the Refuge by neotropical migrant birds.

National Bald Eagle Management Guidelines (May 2007)

In July 2007, the Service issued a final ruling to officially remove the bald eagle from the Federal list of endangered and threatened species. The bald

eagle continues to be protected by the Bald and Golden Eagle protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The Service developed these National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities. The Guidelines are intended to help people minimize such impacts to bald eagles, particularly where they may constitute disturbance," which is prohibited by the Eagle Act. The plan is designed to: (1) Publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law, (2) Advise landowners, land managers and the general public of the potential for various human activities to disturb bald eagles, and (3) Encourage additional nonbinding land management practices that benefit bald eagles. The document is intended primarily as a tool for landowners and planners who seek information and recommendations regarding how to avoid disturbing bald eagles. You can view these management guidelines at: *http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.* We referred to these guidelines as we developed management objectives and strategies for bald eagle.

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

The Emergency Wetlands Resources Act was enacted in 1986 to promote the conservation of wetlands nation-wide. Through this act, the Department of the Interior was directed 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 that complemented the National Plan by providing more detailed information about the wetland resources of the northeastern states (USFWS 1990a). The Regional Wetlands Concept Plan identifies 850 wetland sites that warrant consideration for acquisition. It also describes wetland functions and values as well as identifies wetland loss and threats to those wetlands remaining in the region. Of the total 205 wetland sites identified for the state of Virginia, five are located near the Refuge. Those five sites include: Back Bay Wetlands (3,800 acres), Blackwater Creek (500 acres), North Landing River Wetlands (19,000), Stumpy Lake (500), and West Neck Creek (2,800).

Virginia's Comprehensive Wildlife Conservation Strategy

In 2001, Congress began to provide Virginia with annual funding to supplement existing state fish and wildlife conservation programs. With that came the responsibility for each state and territory to develop a Comprehensive Wildlife Conservation Strategy (CWCS) by October 1, 2005 (VDGIF 2005). This Strategy provides a blueprint and vision for effective and efficient wildlife conservation within Virginia. The plan divides the state up into six different ecological regions (ecoregions) to help facilitate strategic planning. Back Bay National Wildlife Refuge resides in the Middle Atlantic Coastal Plain ecoregion. Some of the major issues addressed in this plan include: (1) A need for greater coordination between conservation partners (2) Unprecedented fragmentation and development of habitat (3) Invasive non-native plants and animals negatively impacting native wildlife and habitats (4) Existing data gaps that impede effective conservation planning and implementation, and (5) A chronic shortfall in funding of conservation programs. Since the issues addressed in Virginia's CWCS and this CCP overlap, this plan has proved helpful when developing our goals and strategies. If you would like to view Virginia's Comprehensive Wildlife Conservation Strategy, please visit: *http://www.vawildlifestrategies.org/draft.html*

A Management Plan for Back Bay and City Comprehensive Plan, City of Virginia Beach

This 1984 Management Plan for Back Bay is an examination and analysis of the physical, chemical, and biological characteristics of Back Bay and its watershed. Existing ecological data, dating back to the late 19th Century, was examined in addition to site specific investigations of terrestrial and aquatic vegetation, water quality, and water quantity. The Plan also provided management

recommendations for the watershed. This Plan's comprehensive analysis of the watershed provides a base-level comparison for determining the effects of past, current, and future management decisions through continued monitoring programs. The 2003 Comprehensive Plan for the City of Virginia Beach includes a chapter on natural resources and environmental quality (City of Virginia Beach 2003). This more recent plan provides local strategies for managing natural resources, including references to SWAMP (see below).

Southern Watershed Area Management Program (SWAMP), Hampton Roads Planning District Commission

This program's mission is to protect and enhance the natural resources, sensitive lands and water supplies of the southern watersheds of Chesapeake and Virginia Beach. The Program's purpose is to develop and implement collaborative watershed management to balance protection of natural resources with economic development. Due to increased development encroaching on the Refuge and the Back Bay Watershed, participating and partnering in the various initiatives of SWAMP is critical.

Recovery Plans

Atlantic Coast Piping Plover Recovery Plan
Refuge piping plover use occurs during the spring and fall migrations. Only four to five piping plovers are usually recorded during this time. As of July 2009, nesting has not yet occurred on Refuge beaches, probably because of the lack of suitable nesting areas. Refuge biological staff, conduct periodic shorebird surveys and are alert to piping plover nesting possibilities, and what to do in the event a nest is found.

In 1996, a revision was made to the original 1988 Atlantic Coast Piping Plover Recovery Plan (USFWS 1996). The primary objective of the revised recovery program is to remove the piping plover population from the List of Endangered and Threatened Wildlife and Plants. The plan is designed to: (1) achieve well-distributed increases in numbers and productivity of breeding pairs, and (2) provide for long-term protection of breeding and wintering plovers and their habitat. The strategies within the plan provide for the ensured long-term viability of piping plover populations in the wild. There are a total of 20 piping plover potential breeding sites in the state of Virginia. The closest site to the Refuge is Craney Island (VA-8). We were able to utilize this Recovery Plan as we developed some of our management strategies. If you would like to view the Atlantic Coast Piping Plover Recovery Plan, please visit:*http://www.fws.gov/northeast/pipingplover/recplan/*

Chesapeake Bay Region Bald Eagle Recovery Plan
Back Bay NWR hosted the first nesting bald eagle pair in Back Bay in 1992, following the purchase of Tract 104 (North Bay Marshes). Since then, bald eagle nests have increased to six in the Back Bay and North Landing River watersheds; with the newest nest occurring on nearby False Cape State Park in 2005. All nests are active, producing an average of two eaglets per year. Juvenile and adult bald eagles are now regularly seen in this area.

This plan describes the actions necessary to ensure the survival and recovery of bald eagles in the Chesapeake Bay region (USFWS 1990b). The primary goal of the plan was to reclassify the bald eagle from endangered to threatened, working toward full recovery and eventually the delisting of the bald eagle.

The Service has recently proposed nesting management guidelines and a regulatory definition of disturb to help landowners and others understand how they can help protect bald eagles consistent with existing law. Delisted from the Endangered Species Act, bald eagles continue to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Both acts protect bald eagles by prohibiting killing, selling or otherwise harming eagles, their nests or eggs. The BGEPA also protects eagles from disturbance.

If you would like to view the Chesapeake Bay Region Bald Eagle Recovery Plan please visit:*http://ecos.fws.gov/docs/recovery_plans/1990/900927.pdf*

A Recovery Plan for U.S. Populations of Loggerhead Turtle
Back Bay NWR has approximately five miles of Atlantic coast beach habitat. The Refuge partners with False Cape State Park, which owns another five miles of beach habitat, to monitor loggerhead sea turtle nesting activity. In most years, loggerhead sea turtles nest on these beaches and produce over 100 young from each nest. Refuge and Park staff implement Recovery Plan strategies of protecting beach nesting habitats and enhancing hatching success.

This plan describes the actions necessary to ensure the survival and recovery of loggerhead sea turtles (National Marine Fisheries Service & USFWS 1991). The primary goal of the plan is to contribute to the delisting of the turtle from its threatened status. The criteria for delisting the loggerhead sea turtle in the southeast region are, for over a period of 25 years, population levels in North Carolina, South Carolina and Georgia are at pre-listing nesting levels and increasing in Florida; at least 25% of all nesting beaches are in public ownership, is distributed over the entire nesting range and encompasses greater than 50% of the nesting activity; and, all priority one tasks have been successfully implemented. This plan provided direction during the development of our wildlife and habitat management strategies. If you would like to view the Loggerhead Turtle Recovery Plan please visit:*http://ecos.fws.gov/docs/recovery_plans/1991/911226a.pdf*

Refuge Establishment/ History and Purpose

Refuge Establishment History

The Back Bay area has long been famous as a wildfowler's paradise where once large concentrations of wintering waterfowl and shorebirds could be found. Before the Refuge's establishment on June 6, 1938 by Executive Order #7907, the Princess Anne and Ragged Island Hunting Clubs occupied the site. Other well-known hunt clubs in the Back Bay area include the Dudley Island Club, the False Cape Gunning Club, the Cedar Island Club, and the Back Bay Gunning Club. Many of these hunt clubs were founded in the late 1800s and attracted wealthy professionals from as far away as New York and Philadelphia. The Refuge was established in cooperation with the State of Virginia to protect valuable wintering waterfowl habitats, the estuarine system, and the water quality.

Prior to acquisition by the Federal government, the barrier beach portion was generally flat and sandy. The saline soils were unproductive. Periodic "northeasters" and hurricanes pushed large quantities of sea water across these flat beaches, and into Back Bay. During the early 1930's the Civilian Conservation Corps built brush fences and planted cane and bulrush to catch moving sands; thus building and stabilizing new sand dune formations. Later, wooden sand fences were constructed, and many dunes were planted with beachgrass. These new dunes protected the bayside flats from oceanic waters and permitted formation of a brackish marsh that evolved into the existing oligohaline (salinity of <5 ppt) wetlands complex called Back Bay.

Refuge management activities have been principally aimed at providing productive wetland habitats for migratory birds—particularly waterfowl—and ensuring that those wetlands are properly protected. Early Refuge development focused on the creation of freshwater marsh on the barrier island portion of the Refuge to complement existing brackish and salt-water habitats already present. By 1970, approximately 650 acres of mostly unvegetated, salt flats had been converted to freshwater impoundments for waterfowl and shorebirds. Activities that included water level manipulations, discing, root-raking, plowing, prescribed

burning and seeding were used to provide the desired freshwater marsh vegetation that exists to this day.

The Refuge has doubled its size since the early 1990s (Map 1-2). Recent land acquisitions have opened up possibilities for visitor facilities along the western border of the Refuge (Table 1.1). Current visitor facilities are located in the eastern, barrier island portion of the Refuge, where annual visitation is greater than 100,000.

Table 1.1. Land Acquisition History

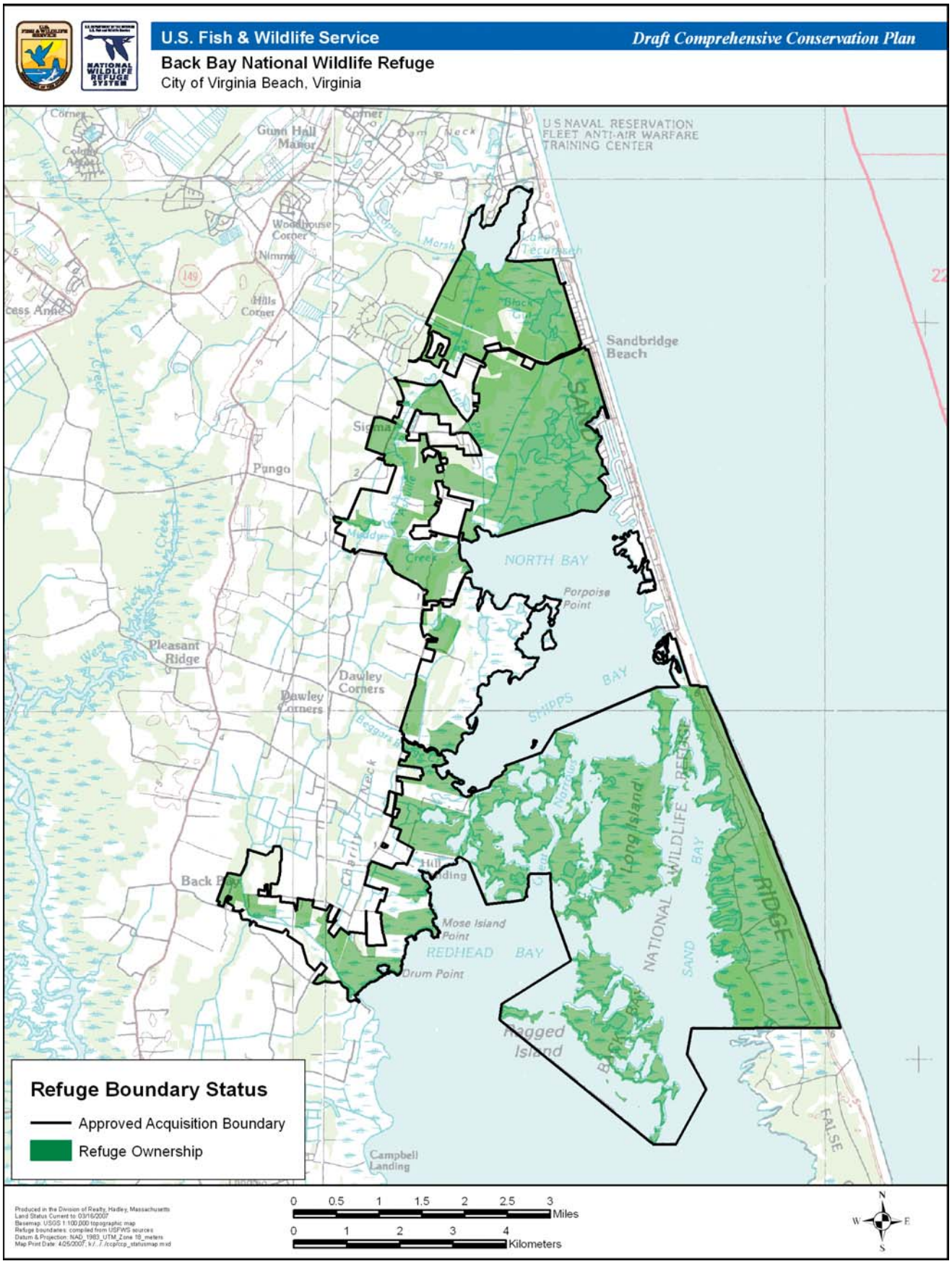
Year of Acquisition	Acreage
1938	4588.76
1990	455.08
1991	95.03
1992	2096.23
1993	410.29
1994	229.13
1995	98.43
1996	275.25
1997	67.62
2000	327.14
2001	51.22
2002	201.54
2004	84.92
2005	14.06
2006	40.31
2007	74.93
2008	10.0
TOTALS	**9119.01**

Refuge Purpose

The original 1938 Executive Order established Back Bay NWR *"....as a Refuge and breeding ground for migratory birds and other wildlife."* Another of the Refuge's primary purposes (for lands acquired under the Migratory Bird Conservation Act) is *"… use as an inviolate sanctuary, or for any other management purpose, for migratory birds."* The Emergency Wetlands Resources Act of 1986 also authorizes purchase of wetlands for the purpose of *"… the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions …..,"* using money from the Land and Water Conservation Fund (LWCF).

In 1939, 4,600 acres of open bay waters within the Refuge boundary were closed to the taking of migratory birds by presidential proclamation. This boundary is referred to as the Refuge Presidential Proclamation Boundary.

The Refuge includes five miles of oceanfront beach, a 900-acre freshwater impoundment complex, numerous Bay islands, bottomland mixed forests, and freshwater wetlands adjacent to Back Bay and its tributary shorelines.


U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
City of Virginia Beach, Virginia
U S NAVAL RESERVATION
FLEET ANTI-AIR WARFARE
TRAINING CENTER
Gum Hall Manor
Woodhouse Corner
Nimmo
Hills Corner
Pungo
Sandbridge Beach
NORTH BAY
Porpoise Point
Pleasant Ridge
Dawley Corners
SHIPPS BAY
Long Island
NATIONAL WILDLIFE REFUGE
RIDGE
Mose Island Point
REDHEAD BAY
Drum Point
Ragged Island
Campbell Landing
Refuge Boundary Status
Approved Acquisition Boundary
Refuge Ownership
0 0.5 1 1.5 2 2.5 3 Miles
0 1 2 3 4 Kilometers
N
W
E
S

The Back Bay NWR Station Management Plan in 1993 expanded the role of the Refuge to include management emphases on other migratory bird groups, including threatened and endangered species, shorebirds, wading birds, marsh birds and songbirds/landbirds.

Existing Refuge Operational Plans

Step-Down Management Plans

The Service Manual (602 FW 4, "Refuge Planning Policy") lists more than 25 step-down management plans that may be appropriate to ensure safe, effective and efficient operation on every Refuge. These plans contain specific strategies and implementation schedules for achieving Refuge goals and objectives. Some plans require annual revisions; others are on a 5 to 10 year revision schedule. Some require additional NEPA analysis, public involvement, and compatibility determinations before they can be implemented.

These step-down plans are current and up-to-date:

- Marsh and Water Management Plan* (MWMP) (1993)
- Croplands Management Plan* (CMP)
- Annual Habitat Management Plan (AHMP)
- Inventory and Monitoring Plan** (IMP) (1989)
- Disease Prevention & Control Plan (2007)
- Public Use Plan (1990, addendums in 1992 & 1994)
- Hunting Plan (2006)
- Law Enforcement Plan
- Safety Plan (2006)

This step-down plan is in draft form and is scheduled to be completed as follows:

- Habitat Management Plan (HMP) (2010)
- Fire Management Plan (FMP) (2011)

**The HMP will include, and replace, these plans.*
***This plan will need updating to meet newer standards.*

Refuge Vision Statement

We developed the following vision statement for the Refuge to provide a guiding philosophy and sense of purpose for our planning effort.

> *Back Bay National Wildlife Refuge will work closely with partners and communities to provide a biologically healthy natural environment that restores abundant fish, wildlife and plant populations. Special consideration will be given to those species whose survival is in jeopardy. In keeping with the Refuge System mission, we will provide a healthy haven of land and water to support Back Bay's diverse wildlife communities, with an emphasis on migratory waterbird and songbird management. We will strive to promote active stewardship of these natural resources for present and future generations, while also providing opportunities for compatible public uses. In doing this, we hope to ensure a sound coexistence between wildlife and people that will allow people*

to share our passion and appreciation of Back Bay's many natural resources, while also enhancing the quality of life in Back Bay.

Refuge Goals

Our planning team developed these goals after reviewing the Refuge purposes, the mission of the Service and Refuge System, our proposed vision, public and partner comments, and the mandates, plans and conservation strategies mentioned above.

Goal 1: Maintain and enhance a diversity of wetland habitats for migratory birds.

Goal 2: Enhance and preserve native woodland diversity and health.

Goal 3: Manage beach and dunes to preserve and protect migratory bird and other wildlife habitats.

Goal 4: Provide healthy natural environments for native fish, wildlife, and plant populations (with special consideration to those species whose survival is in jeopardy).

Goal 5: Provide additional viewing opportunities of migratory birds and other wildlife to increase the general public's appreciation and support of natural resources.

Goal 6: Provide and expand hunting and fishing opportunities to the public where compatible with Refuge purposes.

Goal 7: Promote understanding and appreciation for the conservation of fish, wildlife and their habitats and the role of the Refuge in this effort through effective community outreach programs and partnerships.

Chapter 2



USFWS

Rehabilitated Loggerhead sea turtle returning to ocean

The Planning Process

- **The Comprehensive Planning Process**
- **Key Issues**
- **Opportunities**

The Comprehensive Conservation Planning Process

Service policy establishes an eight-step planning process that also facilitates compliance with NEPA (Figure 2.1). Each of its individual steps is described in detail in the planning policy and CCP training materials (602 FWS 3, "The Comprehensive Conservation Planning Process"). The planning policy can be accessed at:*http://policy.fws.gov/602fw3.html*

Planning Process

The key to effective conservation begins with community involvement. To ensure future management of the Refuge takes into consideration the issues, concerns and opportunities expressed by the public, a variety of public involvement techniques were used.

Open Houses and Public Information Meetings were held throughout the Virginia Beach area at three different locations during January 2002. Meetings were advertised locally through news releases, paid advertisements, and our mailing list. For each meeting, the "open house" session was planned where people could informally learn of the project, and have their questions or concerns addressed in a "one-on-one" situation. The evening Public Information Meeting sessions usually included a presentation of the Refuge, 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. The public meetings allowed us to gather information and ideas from local residents, adjacent landowners, and various organizations and agencies.

An "Issues Workbook" was developed to encourage written comments on topics such as wildlife habitats, nuisance species, and public access to the Refuge. These workbooks were mailed to a diverse group of over 1,500 people on our mailing list, given to people who attended a public meeting, and distributed to anyone who requested one. More than 100 people returned completed workbooks.

After developing and analyzing alternatives from the outcomes of the public meetings and comments, we developed the draft draft CCP/EA. We published a Notice of Availability in the Federal Register on March 30, 2010 announcing its release for public review and comment. During the 33-day comment period from March 30, 2010 to May 1, 2010, we held two public meetingss. We received comments by regular mail, electronic mail, and at the public meetings. Appendix K. is the summary of the comments we received and our responses to them.

This CCP was submitted to our Regional Director for approval. He determined it warrants a Finding of No Significant Impact (FONSI; Appendix L) and found its analysis sufficient to simultaneously issue his decision adopting this CCP. We announced his final decision by publishing a Notice of Availability in th Federal Register, where we also notified people of the availability of the CCP.

Compatibility Policy/Compatibility Determinations
The Compatibility Determinations issued with this CCP may be revisited sooner then the mandatory date if new information reveals unacceptable impacts or incompatibility with the Refuge purposes.

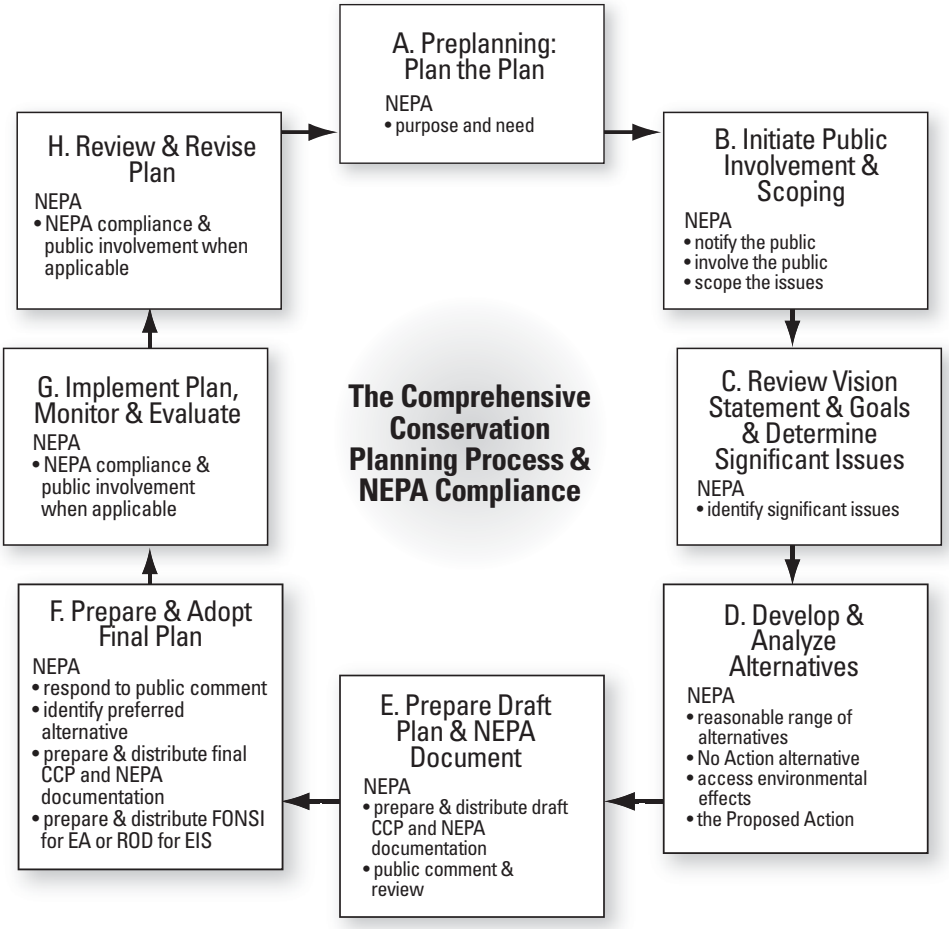


Figure 2.1. Steps in the Comprehensive Conservation Planning Process and its relationship to the National Environmental Policy Act of 1969.

Key Issues

We define and issue as "any unsettled matter requiring a management decision." That can be an "initiative, opportunity, resource management problem, threat to a resource, conflict in use, or a public concern." Issues arise from many sources, including our staff, other Service programs, state agencies, other Federal agencies, our partners, neighbors, user groups, or Congress. The following summary provides a context for the issues that arose during the planning process.

Prescribed Burning/Wildfires: As the City of Virginia Beach and the community of Sandbridge grow and develop there is an increase in the wildland/urban interface. Presently, Back Bay NWR maintains approximately 1.4 miles of fuel-break between forested/brushy Refuge habitats and the western edge of the residential community of Sandbridge. This fuel-break was cleared of mid-story vegetation (ladder fuels) to a width of 50 to 75 feet and is maintained by removal of vegetation. Mature trees are left in the fuel-break; without ladder fuels wildfires will be slowed and easily extinguished. The Refuge follows an approved Fire Management Plan that was completed in 2003. There is concern about the possibility of wildfire in the urban interface.

Invasive Plant Management: Non-native invasive plant species have taken over valuable habitat on the Refuge. Phragmites reed and Japanese stiltgrass are the non-native, invasive species most common to the Refuge. American lotus, although native, has potential to become invasive and a nuisance. These invasives greatly reduce species biodiversity outcompeting native species that are crucial sources of food for migratory birds.

Pest Species Management: The two pest animals with the greatest potential to negatively impact Refuge resources are the feral hog and resident Canada goose. (Some nutria are also present in the area, but are not deemed to be a problem as yet.) Non-native feral hogs root in soft wetland soils, eating the roots and tubers of waterbird food-plants, and decreasing the quantity and quality of plant material available to native animals and migratory waterfowl. Hog rooting along dike slopes increases the potential for erosion. Also, hogs will opportunistically eat birds, nestlings, reptiles, amphibians and small mammals. Present management includes a one-week feral hog hunt and selective shooting of individual animals by Refuge personnel outside the hunt period.

The resident Canada goose population has shown a gradual increase within the Refuge impoundment complex during the past 15 years. Much of this increase stems from their nesting within the impoundment complex and adjacent areas. As the population has grown to an estimated 100+ resident birds, increased grazing on impoundments' moist soil vegetation during the summer and fall was noticed, that directly conflicted with the Refuge goal of providing food for wintering waterfowl. In addition, local farmers began complaining of Canada goose depredation impacts on their agricultural crops to the west. Refuge biological staff began addressing this problem during 2001 by addling Canada goose eggs in located nests. However, this practice alone was inadequate, since local goose production continued. Recently, Refuge biologists have begun directly controlling the nesting Canada goose population by removing, when possible, nesting adults in the Refuge impoundment vicinity. Egg addling and goose removals are continuing, under the appropriate Federal permit.

A small feral horse population periodically moves through the Refuge barrier island area from North Carolina, and feeds on developing waterfowl food-plants within Refuge impoundments. They present another potential nuisance animal problem if the population increases (see below for further feral horse information).

Feral Horses Management: The public generally enjoy viewing horses on the Refuge, but feral horses destroy vegetation and spread non-native, undesirable plant seeds through their droppings. A fence was built by the Corolla Wild Horse Fund of North Carolina at the southern border of False Cape State Park where it abuts North Carolina. Occasionally horses get through, around, or over this fence. Volunteers round up and return horses when contacted by Refuge personnel or Sandbridge residents.

Mosquito Control: The City of Virginia Beach had concerns about the presence of West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) in local mosquito populations during the planning process. The Refuge shared those concerns, and cooperated with the local City Mosquito Control Biologist in mosquito monitoring and data sharing, both on and adjacent to the Refuge. To date, WNV and EEE have not been detected in mosquito populations that use the Refuge or adjacent lands.

Sea Turtle Management Program: The Refuge is located in the northernmost limit of the threatened loggerhead sea turtle nesting range. From May through

the end of August, Refuge staff and volunteers patrol local beaches by ATV or 4WD vehicle for sea turtle crawls. When a patrol encounters signs of nesting, they contact a Refuge biologist. Because the Refuge supports a relatively low number of nests (typically less than 9) per year, more intensive management actions can be undertaken to ensure nest success. All nests are relocated to a secluded Refuge nursery behind the primary dune, and protected from predation by placing wire cages around them. Nests are carefully monitored when close to hatching. Sea turtle hatchlings from relocated nests are transported to the beach and protected from predation as they enter the ocean. Data from the Refuge sea turtle nesting program is collected and summarized into an annual report that is shared with many other Federal and State agencies. Use of volunteers, interns and FCSP staff are critical to the success of the Refuge sea turtle management program. Some state biologists have concerns with transplanting nests. The Refuge is also concerned with how declining budgets might impact the sea turtle program.

Wilderness Review: The Refuge Planning Policy requires a formal Wilderness Review to determine if any lands and waters held in fee title ownership are suitable for designation as a Wilderness Area under the terms of the Wilderness Act. Some of the eligibility criteria include; lands that are 5,000 acres of contiguous land, roadless islands, or are of sufficient size to make practical its preservation and use in an unimpaired condition. The planning team determined that areas previously proposed in 1974 as suitable for inclusion as wilderness no longer meet the minimum criteria. The Wilderness Review is attached as Appendix B.

Cooperative Farming Program: Presently, Back Bay NWR has approximately 100 acres of upland and prior-converted wetlands in 4 tracts leased out to four local farmers for growing crops. The farmers provide direct payment or payment-in-kind in the form of Refuge habitat improvements using their heavy equipment. At issue is the relationship of cooperative farming to new Refuge policies regarding biological integrity, and also compatibility. Some agricultural lands were wetlands prior to conversion to farmland. Under present management, farmers are allowed to continue farming. The Refuge benefits because land is kept free from encroachment of undesirable plant species before possible habitat restoration begins. These areas may be subject to wetlands restoration, shrub-scrub habitat creation, or natural regeneration to forest (to close up fragmented forest habitats) when funding and personnel become available. If cooperative farmers voluntarily withdraw from the program then those areas will be revegetated with native trees and shrubs.

Wildlife Disturbance Law Enforcement: The Refuge maintains a proactive law enforcement program and enforces Federal, State, and local laws. USFWS Refuge Officers patrol Refuge property; primary enforcement efforts concentrate on the protection of natural resources and enforcing the Refuge-specific regulations. While the majority of violations on Refuge property are enforced through the Federal court system, there are rare occasions when a case may be transferred to the city court system for prosecution.

The Refuge manages approximately 3,500 acres of land that has not been formally identified for public use activities. This includes islands in Back Bay and tracts of land to the north and west of Back Bay. Law enforcement problems on these tracts range from trespassing, illegal hunting, dumping, and human-caused wildfires, to use of metal detectors.

Realty/Ownership: There is concern over encroachment onto the Refuge by adjacent property owners. This includes piers/docks where the Refuge owns the

bottom of the Bay and canals, and swimming pools and fence lines that are on our lands. Also, the Refuge is concerned about new City roads and infrastructure impacting Refuge wildlife, habitat and resources.

Jurisdiction: Currently, there is not concurrent jurisdiction among the various law enforcement agencies (City, State, Federal) to enforce regulations on the Refuge. This issue was raised several years ago in an effort to put all national wildlife refuges under concurrent jurisdiction; however, it was never passed by State legislators. Concurrent jurisdiction would allow increased cooperative work between the three entities and their staff. One option would be to obtain jurisdictional control over the lands and waters which surround the islands to provide protection of wildlife values.

Off-Refuge Land Development: The Refuge is experiencing increasing development pressure within the northwestern portion of the Back Bay watershed and immediately north of the Refuge headquarters, on the barrier island portion. These development pressures take the form of single family housing developments, a five story condominium complex and a proposed recreational mooring facility. Such pressures present conflicts to critical Refuge resources including migratory bird use, water quality, existing Back Bay recovery programs, the declining Bay ecology, and a variety of other important issues.

Refuge Access: The Refuge has a seasonal dike trail closure from November 1 through March 31 annually, to prevent disturbance of wintering waterfowl within the impoundments. Several groups and individuals have requested that the impoundments be open year round for recreation activities. The Refuge manages approximately five miles of beach – the "north mile" is closed to visitors, and acts as a safeguard between the high-use area of Little Island City Park and the Refuge.

Boat/water access: In 1939, 4,600 acres of bay waters within the Refuge boundary were set aside by Presidential Proclamation as a waterfowl sanctuary. The area is closed to waterfowl hunting to assure long term protection of waterfowl and other wetland dependent species. The Refuge has no jurisdiction over water uses of the Bay, except for the migratory bird hunting.

Motor Vehicle Access Permit Program: For many years, Back Bay NWR was open to vehicular beach access and use by the general public. In 1969, with visitation reaching 348,000 yearly, it became evident that the increased Refuge and beach use had resulted in environmental degradation and a serious conflict of the Refuge's intended purpose. In 1972, the Refuge beach became closed to all unauthorized vehicular traffic. In 1973, after a final rulemaking in the Federal Register, permits were issued for vehicular beach use to property owners and businesses south of Back Bay NWR up to a point 1600 feet south of the Currituck Lighthouse in North Carolina. These permits were issued to individuals providing proof of residency and to businesses at the time of enactment requiring beach access to reach Virginia. Originally, 100 permits were issued. Permits are non-transferable and non-inheritable; therefore through attrition, only 15 residential, 5 commercial, and 9 cooperatives (i.e., utility companies, emergency responders, Currituck NWR and FCSP) presently maintain permits.

Entrance Fees: Back Bay NWR currently collects an entrance fee. Two seasonal fee collectors collected approximately $50,000 in Fiscal Year 2006. The entrance station operation, staffed from April through October, provides a checkpoint to ensure appropriate resource use and protection, and to provide another source for visitor information. Funds generated from the fee collection program are used

to cover the cost of collection and to provide revenue enhancement for public use facility operation and maintenance, as well as for various habitat management projects. Fee collection is suspended for the months of November through March, annually. Some visitors have commented that they believe no entrance fee should be charged to access public lands.

Tram Tours: Tram tours are available at various times of the year, primarily to provide visitor access to and from FCSP, and to give visitors additional opportunities to see wildlife. Tram tours are provided daily from Memorial Day through Labor Day (weather permitting), Friday/Saturday/Sunday during shoulder months (April-May, and September-October), and twice per month during the November through March impoundment closure. The trams are currently operated by the Back Bay Restoration Foundation (BBRF) but maintained by Refuge staff. Future changes made to the tram program could be an issue to the public and partners.

Hunting: The Refuge, in conjunction with False Cape State Park, runs an up to seven-day annual hunt for white-tailed deer and feral hogs. Hunters are selected using a lottery system. There are eight designated hunt zones on the Refuge, including Long Island where there are only deer, and which is accessible only by boat. One hunting zone is set aside for disabled hunters. The hunt serves a dual purpose of providing public opportunity for hunting, and reducing the numbers of deer and hog, which is a necessity for proper habitat management. Requests have been made to the Refuge to open up the west and north sides to deer hunting. The Refuge is considering it, but fragmented land ownership interlaced with private property makes it more challenging. There are also advocacy groups that are against hunting altogether.

Dog walking on the Refuge: Currently leashed dogs are permitted in opened areas on the Refuge from October 1 through March 31. There are requests to allow dog walking on the Refuge year-round amid concerns that dog walking could be damaging to wildlife use of the Refuge, particularly within the impoundment complex.

Horseback riding on the Refuge: Currently horseback riding is not permitted on the Refuge but several groups have expressed their dissatisfaction with that regulation.

Opportunities

Establish new trails to enhance opportunities for wildlife observation, photography, and environmental education/interpretation: Since the late 1980's when the Refuge acquisition boundary was expanded, numerous parcels have been acquired throughout the Back Bay Watershed. These new lands provide opportunities to promote outdoor experiences through a network of trails and overlooks.

Construction of new headquarters, Visitor Center and maintenance compound: The visitor center, headquarters office and maintenance compound are all currently located at the barrier island in Sandbridge. With the additional land base on the west side of Back Bay, it is proposed to construct a new headquarters, visitor center, and environmental education center on New Bridge Road (Tracts #244 and #141). There is concern facilities should be more accessible to the public and closer to the center of town. This location would be centrally located to all Refuge property and assets.

Establish new and strengthen current partnerships with conservation organizations and individuals: The Refuge relies on partnerships with several

organizations and individuals for helping with Refuge programs, biological surveys, environmental education, and other efforts.

Chapter 3



USFWS

Great egret looking for lunch along Back Bay shoreline

Refuge Resources

- Summary
- Physical Environment
- Biological Environment
- Socio-Economic Factors
- Archaeological and Historical Resources
- Refuge Management and Use

Summary

Back Bay National Wildlife Refuge is located in southeastern Virginia along the Atlantic Ocean and within the southern half of the city limits of Virginia Beach. The environment of this 9,035-acre Refuge consists mostly of water, barrier sand dunes, and wetland marsh. The immediate surrounding environment is residential, rural agriculture, barrier dunes, inland water, and ocean front. The area just north of the Refuge is urban.

Back Bay NWR was established by Executive Order #7907 on June 6, 1938. Prior to acquisition by the Federal government, the barrier beach portion was generally flat and sandy. The saline soils were unproductive. Periodic storms from the northeast (northeasters) and hurricanes pushed large quantities of sea water across these flat beaches, and into Back Bay. During the early 1930's the Civilian Conservation Corps built brush fences and planted cane and bulrush to catch moving sands; thus building and stabilizing new sand dune formations. Later, wooden sand fences were constructed, and many dunes were planted with Beachgrass (*Ammophila breviligulata*). These new dunes protected the bayside flats from oceanic waters and permitted formation of an oligohaline marsh, which is nearly free of salt particles.

The original 1938 Executive Order established Back Bay NWR *"….as a refuge and breeding ground for migratory birds and other wildlife."* Another of the Refuge's primary purposes (for lands acquired under the Migratory Bird Conservation Act) is *"… use as an inviolate sanctuary, or for any other management purpose, for migratory birds."* The Refuge is part of the eastern portion of the Atlantic Flyway. Waterfowl populations thus form one of the prime reasons for the existence of the area as a National Wildlife Refuge. Once known as a large haven for migratory birds, the past several decades have seen waterfowl populations and submerged aquatic vegetation (SAV) decline. Water quality, however, appears to have generally improved.

The latter half of the twentieth century saw rapid urban growth in the northern half of the City of Virginia Beach. The population of the city increased ten-fold to 425,000 in 2000. Future urban growth has the potential of presenting a major impact on the rural nature of land use surrounding the Refuge. The Refuge has doubled in size since the early 1990's, perhaps stemming additional growth surrounding the bay. This recent land acquisition also opens up the possibility for visitor facilities along the western border of the Refuge. Current visitor facilities are located in the northeast section of the Refuge, where there are more than 100,000 visits per year.

Wildlife diversity and quantity are affected by complex relationships, which are often difficult to grasp. Long term changes in water quality, as measured by suspended sediments and nitrates, have seemingly improved. On the other hand, wildlife, as measured by waterfowl and submerged aquatic vegetation, appears to have declined. Reasons for declining waterfowl populations may be due to local declines in SAV, shifts in the Atlantic Flyway out of the Back Bay region, and overall Atlantic Flyway declines in populations. An understanding of the affected environment notes these changes and helps point the direction to future management goals, both for Back Bay and for the National Wildlife Refuge System as a whole.

Physical Environment

Location

The City of Virginia Beach is in the southeastern corner of Virginia with the Atlantic Ocean to the east; Currituck County, North Carolina to the south; the cities of Chesapeake and Norfolk, Virginia to the west; and the Chesapeake Bay to the north. Land use patterns divide the City of Virginia Beach into three sections. The northern section is the higher density urban and residential region. The southern section is the rural region. The mid section or "Princess Anne Transitional Area" provides a mixed density transition between the urban north and rural south. The boundary between the urban north and Transition Area is known as the Green Line. Back Bay partially bisects the City from the south in an East-West direction, with North Landing River and Back Bay-associated bay complex comprising the primary water areas.

The 9,035 acre Refuge is located in the eastern half of the rural southern section of Virginia Beach. The Refuge is bounded to the east by the Atlantic Ocean, to the south by False Cape State Park and Back Bay, to the west by rural land, to the northwest by the mixed density Transitional Area, to the north by Lake Tecumseh, and to the northeast by the Sandbridge residential resort community.

Climate

The climate of Virginia Beach is modified continental with mild winters and hot, humid summers. The average temperature in winter is 42° F and the average daily minimum temperature is 33° F. In summer, the average temperature is 77° F, and the average daily maximum temperature is 85° F. Annual precipitation averages 45 inches. The growing season is 237 frost-free days, the longest growing season in Virginia. The average seasonal snowfall is 7.2 inches. The average relative humidity in mid-afternoon is approximately 58%. Humidity is higher at night, and the average at dawn is about 78%.

The prevailing wind direction from March through October is from the southwest. Average wind speed is highest in March at 10.6 miles per hour. The prevailing wind direction from November through February is from the northwest. The area is frequently subject to storms out of the northeast during fall, winter, and spring. These storms can produce localized flooding and severe shoreline erosion. The summer in Virginia Beach produces numerous thunderstorms whose strong winds and heavy rains sometimes result in localized flooding. Although Virginia Beach is north of the track usually followed by hurricanes and tropical storms, the city has been struck infrequently by hurricanes.

Wind direction and time of year have a significant impact on the bay within Back Bay NWR. Back Bay is too far north of Currituck Sound to be affected by lunar tides. However, wind tides normally produce a decrease in average mean water level during the winter due to the northwest winds that push its waters southward. The opposite occurs during the rest of the year as mean water level increases due to southwest winds pushing the water northward.

Topography

The flatness of the lands surrounding Back Bay is the central topographic characteristic of the watershed. Pungo Ridge, along which Princess Anne Road runs to the west, has the highest land elevation on the west side of the Bay, reaching 15 to 20 feet above mean sea level (msl) at several points. On the eastern boundary of the Bay, the sand dunes of False Cape present a second ridge of higher elevation, reaching 50 feet msl or greater at a number of locations and 64 feet at the highest. These two parallel ridges trend in a north-south direction.

In between these parallel ridges, on the western Pungo side, lie the better drained uplands. These uplands fall away from the highest elevations to about

five feet msl. This lower elevation is the upper edge of the flood plain. This is where the principal marshes and swamps of the Bay's edge are found. However, throughout the flood plain at its higher elevations and where the soils are inclined to dry out more readily, crops are farmed. Due to the universal flatness and low elevation of the land, flooding from high wind tides is a frequent problem for the farmers, particularly below the three- or four-foot contour levels.

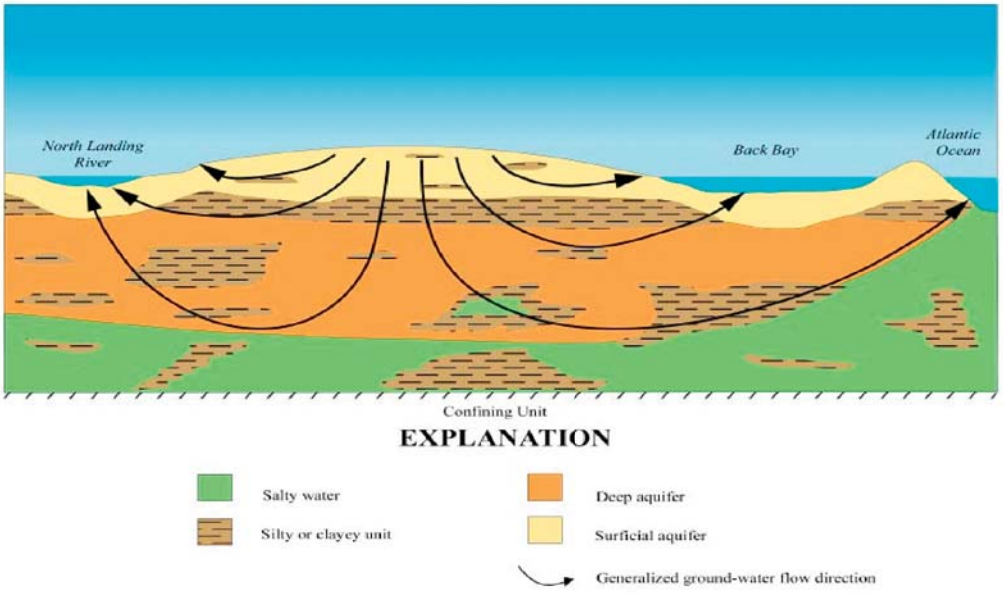
Geology and Groundwater

Roy Mann Associates, Inc. (1984) described the Back Bay area as follows:

> *"Virginia Beach lies within the Atlantic Coastal Plain Physiographic Province. The physiography of the area is typical of that of most of the Atlantic seaboard and consists of gently sloping terrace plains extending seaward from the base of the Appalachian Mountains."*

The entire wedge of coastal plain sediments is composed of stream-carried sands and clays deposited along a shoreline and nearshore environment not dissimilar to that which presently exists in the area. These include beach and dune environments, sand marshes, stream channels and floor deposits. The source of the sands and clays was primarily the down wasting of the eastern seaboard continental land mass. Six stratigraphic units compose the 4,000 feet of unconsolidated sediments of the Coastal Plain in the Virginia Beach and Back Bay region. The uppermost unit, the Columbia Group, is characterized by light colored clays, silts, and sands of recent and Pleistocene Age (2.5 mybp to present). These deposits range between 20 and 50 feet thick and include recent dune, beach, and river sediments.

Figure 3.1. East-west cross-section through southern Virginia Beach (Johnson 1999)



Two primary freshwater aquifers exist in the Back Bay watershed (Roy Mann Associates, Inc. 1984). They are the confined aquifers within the Yorktown formation, and the shallower, unconfined aquifer within the overlying Columbia deposits. Municipal wells are generally within the confined aquifer, while many domestic wells are within the unconfined aquifer (Figure 3.1).

All major groundwater quality criteria, with minor exceptions, have been found to be within applicable concentration standards. Salt water intrusion has been found in deeper groundwater supplies. A small increase in overall nitrate concentrations in groundwater is evident and suggests the impact of agricultural activities. However, for the most part, nitrate concentrations in the shallow regional aquifer are low in comparison with other agricultural areas. In general, groundwater quality in the Back Bay watershed is good.

Soils

The U.S. Department of Agriculture's Soil Conservation Service mapped the soils within the City of Virginia Beach during 1981-1982. The major associations which are found within the Refuge and study area include Acredale-Tomotley-Nimmo, Back Bay-Nanney, and Newhan-Duckston-Corolla. The following descriptions of these associations are taken from the resulting USDA publication, "Soil Survey of City of Virginia Beach, Virginia" (September 1985).

Acredale-Tomotley-Nimmo Association — This association consists of nearly level soils in broad, flat areas of the study area. The Acredale soils are slowly permeable; Tomotley and Nimmo soils are moderately permeable. This association is used mostly for cultivated crops, but some areas are in woodland or are used for community development. Much of this association has been cleared and drained; the drained areas have good suitability for cultivated crops. The main limitation for community development is a seasonal high water table.

Backbay-Nanney Association — This association is primarily found in the marshes and swamps of the study area and Refuge. This soil consists of nearly level, frequently flooded soils on the flood plains of Back Bay and its tributaries. Slopes range from 0 to 1 %. The Backbay soils occur in broad, flat marshes, while the Nanney soils occur in wooded drainage ways and on flood plains. This association has little suitability for most uses other than as wetland wildlife habitat and for woodland. Flooding is the main limitation for use of this soil.

Newhan-Duckston-Corolla Association — This association consists of nearly level to steep, very rapidly permeable soils on grass- and shrub-covered sand dunes, flats, and depressions along the ocean. The Newhan soils are on undulating to steep coastal dunes and are excessively drained; Duckston soils are on nearly level flats and in shallow depressions between coastal dunes and are poorly drained and/or flooded in some areas after heavy rainfall and by overwash by salt water; Corolla soils are on low, undulating coastal dunes and on flats and are somewhat poorly drained to moderately well drained. Most areas of this association are covered by salt-tolerant grasses and shrubs. The major limitations of this association for community development are a seasonal high water table, the very rigid permeability, slope, and the instability of sparsely vegetated areas.

Surface Waters and Wetlands

The Refuge roughly includes the northern two-thirds of the 39 square mile Back Bay complex. This complex is divided by its natural configuration of islands, into five smaller bays: North, Shipps, Redhead, Sand and Back Bays. Numerous channels, narrows, and guts link these bays together, as does sheet-flow across wetlands during high-water events. The surrounding uplands and wetlands cover an additional 64 to 65 square miles. Major drainages into the bay include (from northwest to southwest) Hell Point, Muddy, Beggar's Bridge, Nanney and Devil Creeks. The surrounding lands drain into these five creeks and/or the bay, via numerous connected drainage ditches, and constitute the Back Bay flood plain.

Most of the bay is shallow with an average depth of less than 5 feet. The bay maintains fresh to slightly brackish (0 to 4 parts per thousand ppt salinity) water, with salinity increasing slightly as one proceeds southward. Back Bay has been defined as an oligohaline estuary (Norman 1990). There is no lunar tidal influence because the nearest Atlantic Ocean inlet is 60 miles south of the Refuge. Water level fluctuations are principally wind-generated (wind tide); with sustained southerly winds, generally during summer, moving bay waters to the north and raising the northern bay levels. Sustained northerly winds, generally during winter, move bay waters to the south and decrease mean water levels in the northern Bay areas. During strong wind tides, from the south, the water in flood plain areas will rise 3 to 4 feet, and flood low-lying areas (below the 3- 4 feet contour levels) along Muddy Creek, Nanney Creek and Sandbridge Roads. Roy Mann Associates, Inc. (1984) reports that water circulation in Back Bay is dynamic, where daily fluctuations in water level due to wind alone in excess of 0.75 feet are common. The effect of wind tides on Back Bay is of sufficient strength to enhance the mixing of water from tributaries with adjacent bay water.

Open water, including Back Bay, comprises the most abundant wetlands community type on the Refuge. According to Roy Mann Associates, Inc. (1984) approximately 22% of the Back Bay watershed was wetlands. Emergent wetland vegetation comprised 11,351 acres or 17% of the watershed. Lowland forest with 2,357 acres and scrub-shrub wetlands with 749 acres comprised 4% and 1%, respectively, of the watershed. Much of this vegetation was characterized by relatively homogeneous stands of cattails, and black needlerush.

The 900-acre Refuge freshwater impoundment complex is located on the barrier island portion of the Refuge, south of the headquarters. This ten-impoundment complex consists principally of eight moist soil management units that are flooded in the fall and winter and drawn-down in the spring and summer. Two of the impoundments serve as water reservoirs that hold water as needed, regardless of the season. Water is supplied to this complex by a pair of large pumps that can transport approximately 15,000 gallons per minute from the Bay adjacent to the West Dike, into the C-storage Pool reservoir; from where it is distributed into the desired impoundment via interconnecting water control structures.

Water Quality

Beginning in 1972, and particularly since 1986 onward, the Virginia Department of Environmental Quality has kept extensive surface water quality records on at least ten monitoring sites within or immediately surrounding Back Bay NWR and its tributaries. Samples are collected every one to three months. Data analyzed for this CCP include: salinity, dissolved oxygen, nitrate, pH, temperature, fecal coliform, turbidity (secchi disc; total suspended solids), and phosphorus. Preliminary analysis of a number of water quality parameters indicate generally stable or improving water quality since the mid-1980's, for some specific elements. This may reflect better agricultural and construction practices and a cessation of a period of high suburban growth in the Sandbridge area (personal communication, Mel Atkinson).

For example, one of the water quality sites is located within the bay between Ragged Island and Wash Flats (Station: 5BBKY006.48). This is an excellent open bay site to monitor bay-wide, long-term changes in water quality. Figures 3.2 and 3.3 indicate improving water quality with respect to Total Suspended Solids (TSS) and Nitrates. These TSS and Nitrate improving trends are seen at other monitoring sites as well.

Figure 3.2. Total suspended solids between Ragged Island and Wash Flats from 1986-2003

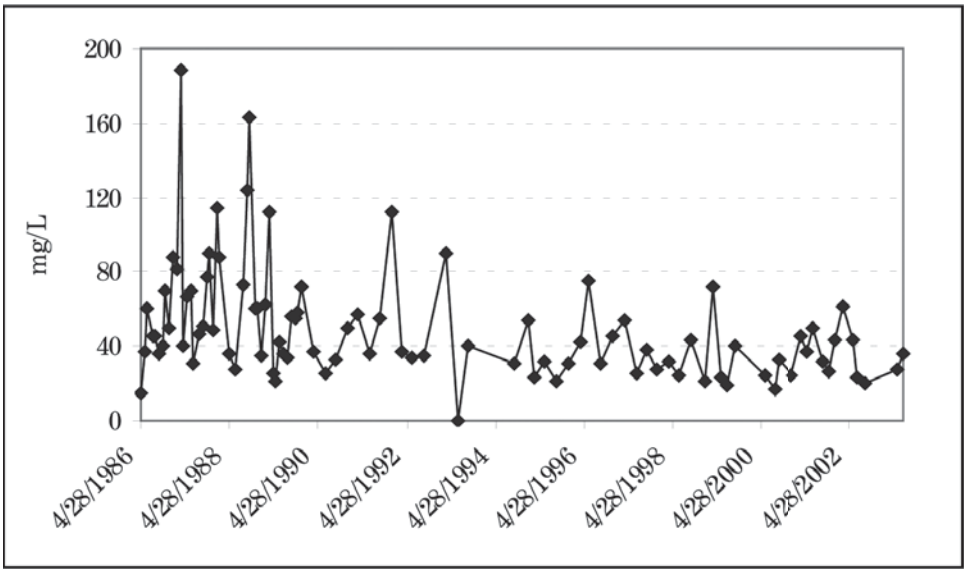
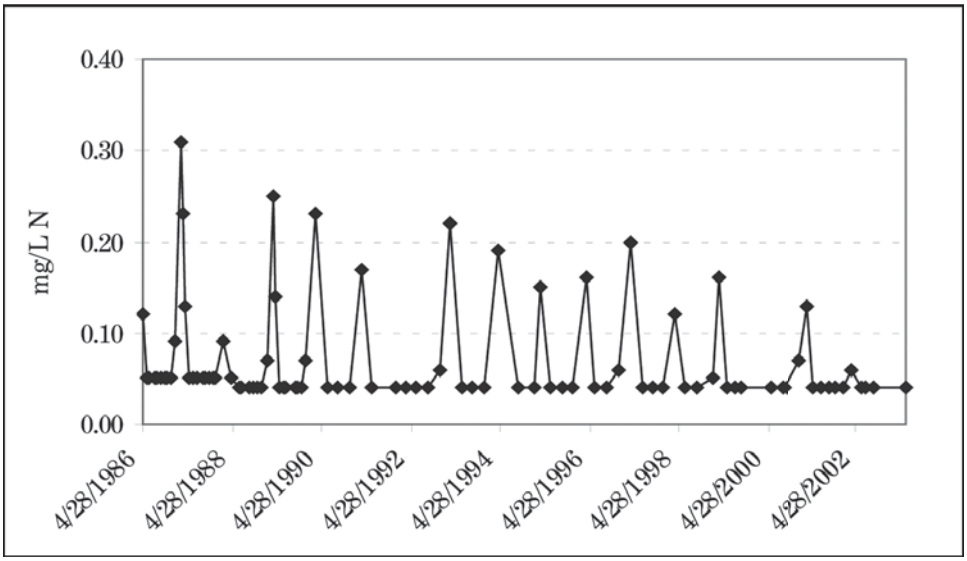


Figure 3.3. Total Nitrate between Ragged Island and Wash Flats from 1986-2003



TSS are solids in water that can be trapped by a paper filter. TSS can include a wide variety of material, such as silt, decaying plant and animal matter, industrial wastes, and sewage. High concentrations of suspended solids can cause many problems for aquatic life.

High TSS can block light from reaching submerged vegetation. As the amount of light passing through the water is reduced, photosynthesis slows down. Reduced rates of photosynthesis causes less dissolved oxygen to be released into the water by plants. If light is completely blocked from bottom dwelling plants, the plants will stop producing oxygen and will die.

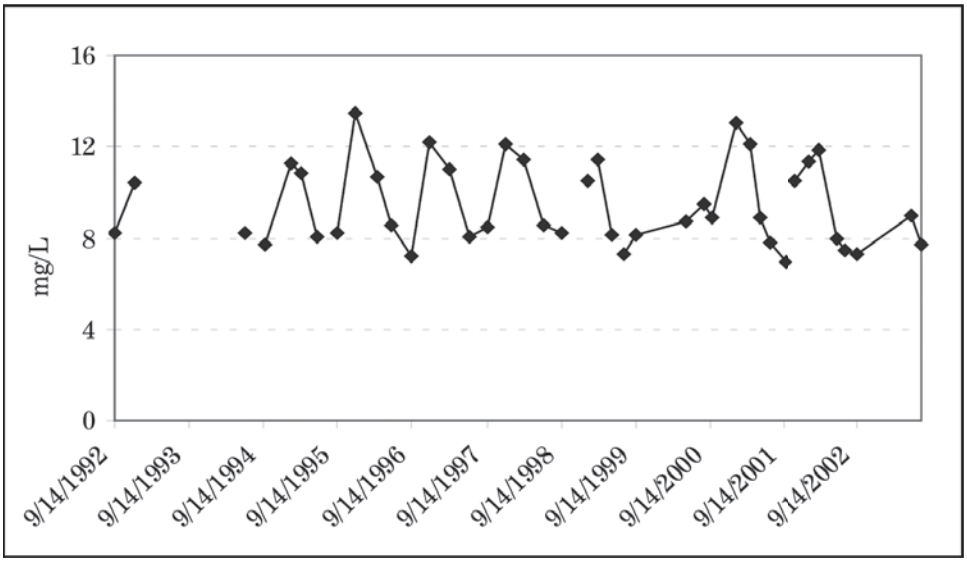
Nitrates and nitrites are nitrogen-oxygen chemical units, which combine with various organic and inorganic compounds. The greatest use of nitrates is as a fertilizer. Most nitrogenous materials in natural waters tend to be converted to nitrate, so all sources of combined nitrogen, particularly organic nitrogen and

ammonia, should be considered as potential nitrate sources. Primary sources of organic nitrates include human sewage and livestock manure, especially from feedlots. The federal drinking water standard is 10 milligrams per liter (mg/l) nitrate-nitrogen (NO_3-N). All stations appear to have nitrate readings within federal drinking water standards.

Standards for pH in Virginia waters are in the range of 6 to 9. Several of the stations had occasional readings above 9, indicating water that is alkaline. The general trend over time has been from slightly alkaline to more neutral water. The standard for surface water temperature is a maximum of 31 degrees Centigrade. Several of the Back Bay tributaries had occasional summer readings slightly above the standard.

Dissolved oxygen is the amount of oxygen dissolved in water, measured in milligrams per liter (mg/L). This component in water is critical to the survival of various aquatic life. Virginia has set a minimum of 4.0 mg/L for dissolved oxygen. Nanney Creek and Beggars Bridge Creek had occasional readings which fell below this standard (Figure 3.4). The rest of the stations had consistent readings above the standard.

Figure 3.4. Dissolved oxygen levels between Ragged Island and Wash Flats,1992-2003



Salinity is the total of all salts dissolved in the water, measured in parts per thousand (ppt). Since 1987, salinity levels have varied. They occur as spikes of increased salinity. These spikes (1987, 1995, 2002) are in the 3 to 5 ppt range (oligohaline) and are within ranges found throughout Currituck Sound (Figure 3.5). Periods of lower salinity (1 ppt. or less) have occurred in Back Bay, and represent water fresher than that found in Currituck Sound.

Since 1991, biweekly water quality sampling at the Refuge headquarters dock revealed that as stream flow input and precipitation levels increased, bay salinity levels generally declined (0 to 2 ppt.). When stream flow input and precipitation levels decreased, bay salinity levels increased (3- 4 ppt.). Salinity is usually regulated by how far north the effects of brackish waters from Albemarle and Currituck Sounds in North Carolina reach. Back Bay's nearest ocean outlet is approximately 60 miles to the south, at Oregon Inlet, NC. So, stream flow regimes and precipitation help regulate this brackish-fresh water interface.

Roy Mann Associates, Inc. (1984) states, "Water quality data for Back Bay indicate a strong phosphorous limitation in the open waters and many of the

tributaries. Therefore if environmental controls are to be established, they should be broad enough that the loading with phosphorous is curtailed as well as limitations being effected on nitrogen and other minerals."

Figure 3.5. Salinity levels between Ragged Island and Wash Flats, 1994-2003

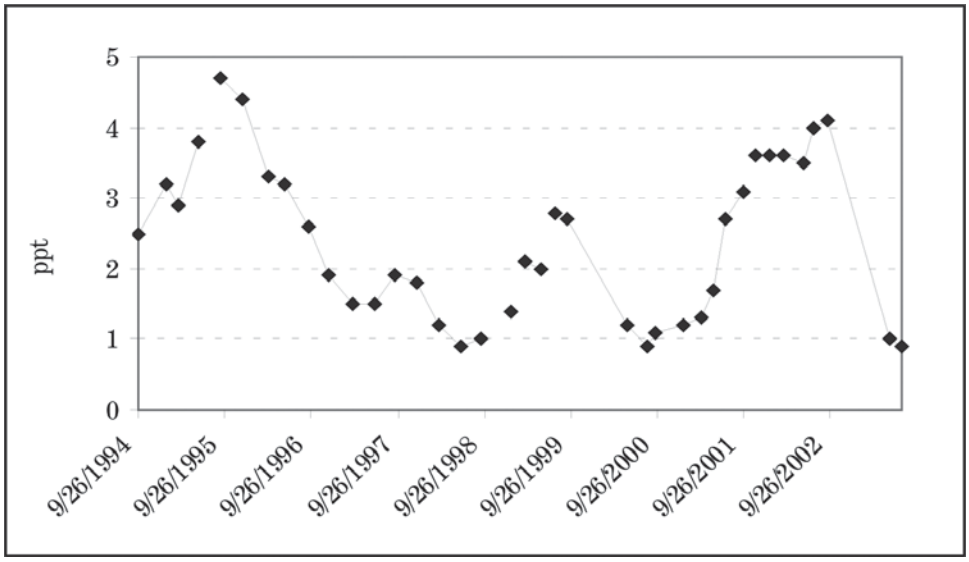
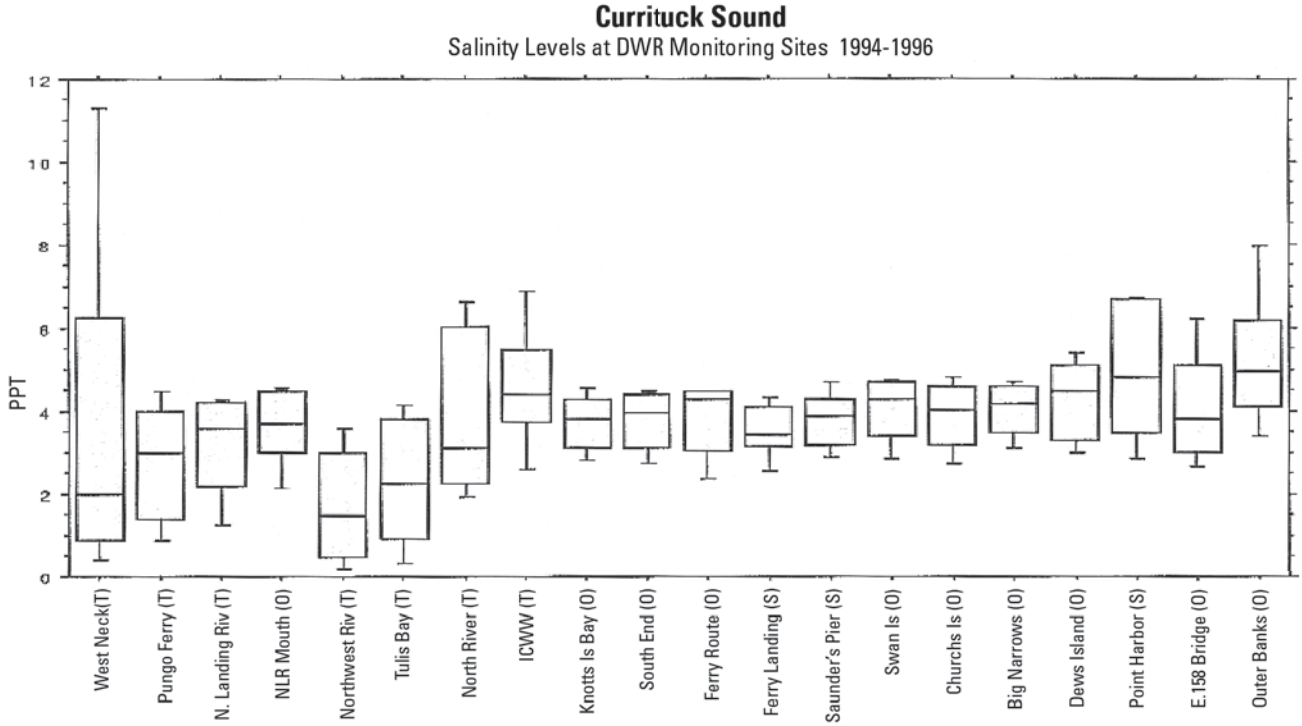


Figure 3.6. Box plots of salinity data recorded by the Division of Water Resources at several stations in Currituck Sound—1994 through 1996. (T = tributary station; O = open water station; and S = shore station) (North Carolina Department of Environment and Natural Resources 1997)



In summary, many improvements in Back Bay's water quality have been occurring. They may be partially attributable to the elimination of the large number of septic systems in Sandbridge following construction of a new city sewer line in the mid 1990s; improvements in local agricultural and hog farming practices; and a reduction in the amount of land use disturbances in the watershed from previous large housing developments (i.e., Lago Mar, Red Mill, Ocean Lakes).

Concerns over the loss of submerged aquatic vegetation (SAV) during the past twenty years have usually been blamed solely on negative impacts to Back Bay's water quality; however, existing water quality data does not appear to support significant water quality degradation. The infrequency of previously referenced water quality data collection (once every three months) presents the possibility of missed spikes or peaks in nutrients, silt, or other pollutant discharges into the watershed. A closer analysis of specific water quality parameters critical to the health and well-being of SAV beds needs to be conducted at the most critical times of year to better understand this complex issue. It is believed that SAV beds both absorb nutrients and reduce turbidity by their presence, as well as serving as a buffer to wave action that reduces erosion of bay and island shorelines. The islands and shorelines of Back Bay have manifested rapid erosion rates during the past 20 years, so that the existing shorelines no longer resemble the most recent United States Geological Survey (USGS) topographic maps.

Fire

Potential Wildfire Hazard. Virginia's wildfire season is normally in March and April and again in October and November. At these times the relative humidity is usually low, winds tend to be high, and fuels are cured to the point where they readily ignite. Fire activity fluctuates not only from month to month, but from year to year. During years when Virginia receives adequate precipitation, wildfire occurrence is low. During low precipitation, wildfire occurrence is high, particularly during periods of warm, dry, windy weather.

Most local wildfires occur outside the normal fire seasons and are thought to be human-caused. There are very few lightning-caused fires. Refuge records show most local wildfires occur during the late winter waterfowl hunting season in late January through early March. These burns create open marsh habitat that attracts snow geese and other waterfowl. Both waxmyrtle and black needlerush are volatile and burn well while green.

All unplanned wildfires are suppressed, where possible, in a safe, and cost-effective manner, with minimum damage to wildlife and private property resources through use of appropriate management strategies.

Efforts are underway to construct and maintain adequate wildland urban interface (WUI) fire-breaks inside Refuge boundaries to protect adjacent private properties in Sandbridge and several bordering roadways (ie. Muddy Creek, Sandbridge, Colechester, New Bridge Roads). Those WUI fire-break construction efforts will continue until the threat of wildfire to private residences, and to Refuge natural habitats, is greatly reduced or eliminated.

Role of Fire in the Ecosystem. A combination of fire types, including naturally occurring (lightning-caused) fires (Kirwan and Shugart 2000), and fires associated with Native American and European colonists' (Patterson and Sassman 1988) activities, have historically influenced vegetation in the eastern United States. Naturally occurring fire is infrequent in the mid-Atlantic; however, human-set fire has historically, and dramatically impacted the ecology of the region, including coastal Virginia (Brown 2000). Many open areas have

been created by slash-and-burn agricultural practices of Native Americans and from the harvesting and gathering of firewood (Brown 2000).

Frost (1995) portrays the Back Bay vicinity of southeastern Virginia to be a wetland area that maintained a presettlement fire regime, or frequency of 4-6 years, with most marsh fires probably igniting from fire moving through vegetation on adjacent uplands, with the original fire igniting from a lightning strike. Frost (1995) goes on further to state that, "successive reduction in fire frequency, as has occurred throughout the South, leads to dominance of oligohaline marshes by a few tall marsh species and *Juncus roemerianus*." Losses of wetland plant species richness, including such rare fire-dependent types as the spikerush and eryngo, subsequently have occurred.

Bratton and Davison (1986) found historical evidence of fire in maritime forests of Cape Hatteras, North Carolina. The authors concluded that fire suppression, in combination with other disturbances, increased pine species, decreased oak species, and shifted fire regimes from small, frequent, low-intensity fires, to infrequent, larger, high-intensity fires. The authors also concluded that fuel management would be necessary to restore the site to oak dominance, its pre-settlement condition. Back Bay NWR, immediately to the north, has a similar situation in effect that should lead to new evaluations of fuel-loading, loblolly pine invasion, and live oak perpetuation in its maritime and bottomland forests.

The bird nesting season creates a need to avoid burning during the last week of March through June of each year, if possible. Therefore, the Refuge prescribed fire season normally runs from September through November, or March if necessary.

Discussions with longtime local residents reveal that the local populace has historically burned off black needlerush marshes in late fall and winter, in the belief that it improves the marshes for wintering waterfowl use. After careful consideration and research, we have concluded that prescribed burning of Back Bay NWR needlerush and saltmeadow hay marshes should be encouraged in the future. Objectives of prescribed fire include 1) Protect life and property; 2) Perpetuate the migratory bird resource; 3) Preserve native wetland biotic communities in their natural states; 4) Maintain maximum habitat diversity for the benefit of wildlife; 5) Protect, restore, and maintain endangered and threatened species and their habitats; 6) Implement a safe and cost-effective program of resource protection and enhancement; and 7) Reduce hazardous fuels. When carried out wisely, in 3-4 year cycles, the following habitat and wildlife benefits are realized:

a. Reduction of fuel-loading, especially matted needlerush stems among live plants and on marsh substrate. Fuel-loading also stifles germination of beneficial food-plants.

b. Increased use by wintering and migrating waterfowl (ducks, geese and tundra swans) of marsh areas, after the long, needle-tipped stems are removed.

c. Increased germination of desirable, herbaceous waterbird food-plants already in the seed-bank, by increasing sunlight penetration to marsh soils.

d. Rapid recycling of nutrients into the soil and remaining plant rootstocks.

Prescribed burning objectives during the 1990s and later have revolved around control of the invasive pest, Common, or Phragmites reed *(Phragmites australis)*. Prescribed burning has been used to remove the dense dead stands

of reeds that continue to stand for several years after dying. By continuing to shade the ground, these dead stands reduce or eliminate germination of more desirable annual food plants. By burning the dead stands, the shading ground cover and seed source is removed. Once the sun consistently reaches the ground, germination and production of more desirable plants occurs, from within the existing, diverse seed bank.

The only known exception to this needlerush prescribed burning recommendation, is in the western North Bay Marshes vicinity, where mixed needlerush and Phragmites reed marsh supports a breeding population of the Least bittern. The Least bittern is a "Species of Special Concern" in the state of Virginia. Removal of this unique habitat type's low-canopy platforms, created by lodge-poled reeds resting atop needlerush tips could result in a local decline of nesting and resting least bitterns.

In addition, the active bald eagle nest site on the woods edge of western North Bay Marshes, should also be protected from fire, especially during their December–May breeding season. This site is a priority protection area during a North Bay Marshes prescribed burn or a wild fire.

Within the impoundment complex, the eastern one-third of A, B and C Pools, and most of G, H and J Pools, are critical fall-winter fire protection areas. These moist soil units comprise much of the late winter food supply for wintering and migrating waterfowl. They are also priority protection areas during prescribed burns or a wildfire.

The Roanoke-Tar-Neuse-Cape Fear Ecosystem (RTNCF) Refuges Biological Review of 2000 (USFWS 2002) recommended an increased use of prescribed fire in future habitats management efforts.

Air and Noise

The U.S. EPA has set national air quality standards for six common pollutants, including ozone. Ground-level ozone, the main ingredient of smog, is a colorless gas formed by the reaction of sunlight with vehicle emissions, gasoline fumes, solvent vapors, and power plant and industrial emissions. Three ozone stations are located in the Hampton Roads region (Virginia Department of Environmental Quality 2005). Ozone data from 1990 to 2002 indicate that the number of times when air quality monitors have recorded ozone concentrations greater than 84 parts per billion, (the health-based air quality standard measured over eight hours), appears to be increasing from an average of four to seven times a year. For the three year period 2000 to 2002, and again in 2003, EPA classified the Hampton Roads region, including Virginia Beach as an 8-hour ozone non-attainment area (Figure 3.7). In prior years the region was a non-attainment area for the previously used 1-hour standard. By 2007, Virginia will submit a plan to reduce the level of ozone in non-attainment areas.

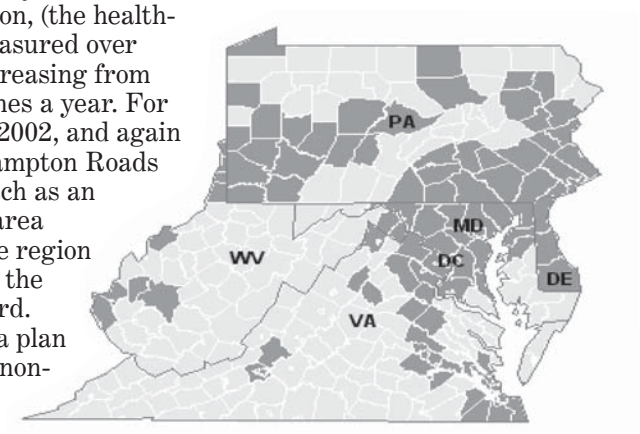
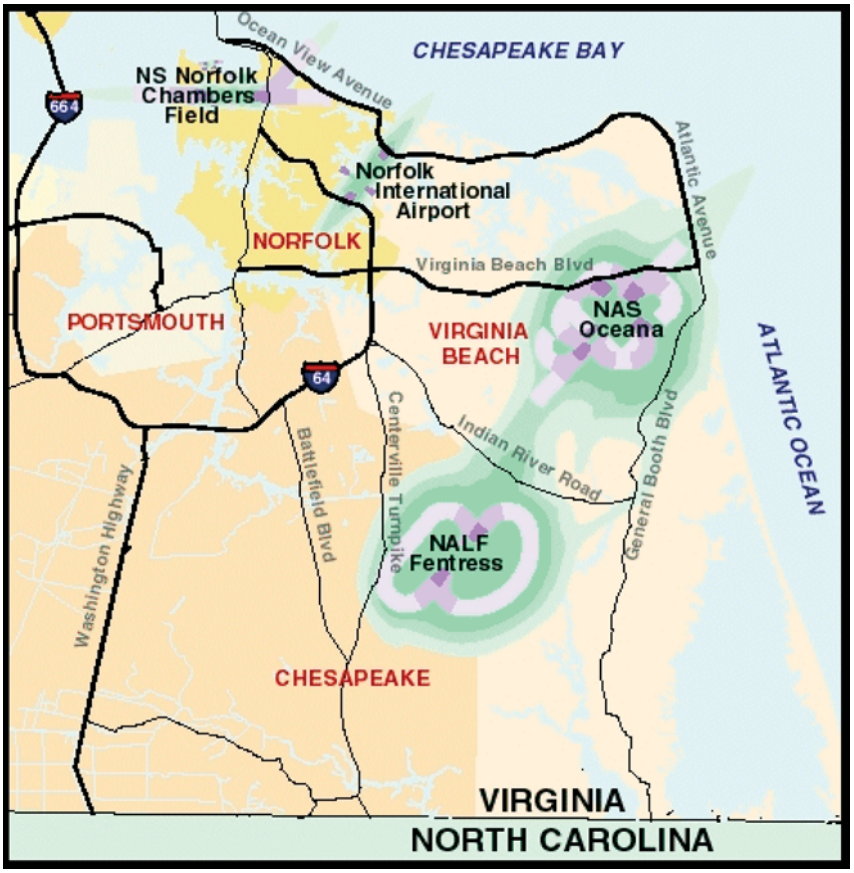


Figure 3.7. Mid-Atlantic Ozone Non-attainment Areas (Source: EPA 2003)

Local air quality concerns at the Refuge revolve primarily around smoke generated by prescribed fire burns, such as the fire break between the Refuge and Sandbridge community. Back Bay NWR contains vegetation and habitats capable of sustaining wildland fire, thereby requiring a fire management plan. Fires are timed as to create the least impact on the surrounding community.

Virginia Beach has a military base, Oceana Naval Air Station, for F-14 Tomcats and F/A-18-Hornet Squadrons. Noise levels can be excessively high just north and west of Back Bay NWR in areas surrounding Oceana (Virginia Beach) and Fentress Air Field (Chesapeake). The City's 2003 high noise zone map (AICUZ) locates Back Bay NWR within the least impacted area, with average noise levels less that 65 decibel dB (Figure 3.8). The military has cooperated in not conducting low altitude flights over the Refuge.

Figure 3.8. High Noise Zones within the Virginia Beach region.
(http://www.nasoceana.navy.mil/aicuz/)



Visual Resources

The expanses of visual natural resources that characterize the Refuge are of immeasurable value. The diversity of habitats, such as the beaches, dunes, bays, streams, swamps, woodlands, farmland, extensive marshes and islands all contribute to the scenic quality of Back Bay. Two of the most striking visual assets of the Refuge are the long, unbroken beach/dune vista and the extensive

marshes. The visual resources have gained increasing importance over the decades as development continues to occur on similar, previously unspoiled coastal barrier islands along the East Coast of the United States. The Refuge now provides a vivid visual contrast to developed areas located just north and west of the Refuge boundary.

From the dune ridges, vistas span from the ocean to the marsh, giving the area a sense of ecosystem continuity. The extensive marshes give way to forested swamp, woodlands, and farmland to the north and west. The diversity and distribution of fauna and flora along this section of barrier island and its associated Bay marshes are both interesting and complex, and contribute significantly to the Refuge's visual quality.

Although much of the landscape within the Refuge has been altered by man, some of these modifications, such as dune building and impoundment construction, have been effectively blended with the surrounding terrain. The constructed dune line, trail system and dike roads offer controlled public access to relatively undisturbed oceanfront, bay shoreline, wetlands, and upland forest. Such access provides an increasingly urban population the opportunity for unparalleled wildlife viewing, photography, nature study, environmental education, solitude and other visuals-related experiences that can rarely be found in urban environments.

Contaminants

As stated earlier, Back Bay itself is divided into five smaller bays: North, Shipps, Redhead, Sand and Back Bay proper. However, there are significant waterways which feed Back Bay that could transport contaminants to Back Bay. Those water-bodies are Hell Point Creek, Asheville Creek, Beggars Bridge Creek, Muddy Creek, Nanney Creek, and Scopus Marsh Creek.

Minor contaminant issues are identified and dealt with prior to acquisition. Species of concern to the Refuge includes migratory and resident waterfowl, nesting sea turtles, bald eagles and other migratory birds, fishes and all their appropriate habitats. Contaminant threats to these resources can be assessed as follows:

- potential spills from vehicular accidents on Princess Anne or Sandbridge Roads;
- spills along the Atlantic Coast from shipping traffic, which could present significant threat and depend on currents, tides, wind conditions, contaminant and proximity to the coast;
- spills from properties and small roadways along any of the watersheds that feed Back Bay; and,
- chronic problems associated with growing suburban sprawl including residential uses and abuses of pesticides, insecticides and fertilizers.

Acquisitions and protection by the Service and other agencies or non-profit conservation organizations serve to protect the smaller watersheds and Back Bay, and provide a buffer for lower levels of pollution associated with residential and light commercial uses; such buffering can also result in improved water quality in Back Bay.

Biological Environment—Vegetation

Vegetation Types

A large variety of vegetation types exist in and around Back Bay NWR. They can be classified in various ways, including uplands and wetlands (Map 3-1, table 3.1).

Table 3.1. Back Bay NWR General Habitats & Vegetation Communities*

General Habitat	Vegetation Community(ies)*	Dominant Species	Comments
Mixed Wooded Wetland	Non-Riverine Wet Hardwood Forest	Loblolly pine, Pond pine, Tupelo spp., Inkberry, Waxmyrtle & 2-3 ferns.	Saturated soils. Giant cane & Greenbriers are often present.
Deciduous Wooded Wetland Mixed w/Marsh	Estuarine Fringe Swamp Forest	Bald cypress, Swamp tupelo, Loblolly pine, Sweetbay, Redbay, Waxmyrtle & Royal fern.	Subject to irregular wind-tidal flooding.
Maritime Wooded Swamp	1) Maritime Swamp Forest 2) Estuarine Fringe Swamp Forest	1) Red maple, Sweetgum, Black gum/tupelo, Black willow, Sweetbay, Blue-berry, Waxmyrtle, Redbay, VA. Chain fern. 2) Bald cypress, Swamp tupelo, Loblolly pine, Sweetbay, Redbay, Waxmyrtle & Royal fern.	Seasonally flooded and/ or saturated soils, with hummock & hollow microtopography.
Shrub-scrub Wetland	1) Maritime Mixed Forest, 2) Maritime Shrub Swamp	1) Loblolly pine, Water oak, So. Red oak, Black cherry, American holly, Greenbrier, Blueberry, grape, ferns. 2) Waxmyrtle, Inkberry, Blueberry, Poison ivy, ferns.	Often on leeward slopes of dunes; Usually holds freshwater through most of year.
Maritime Upland Woodland	1) Maritime Loblolly Pine Forest 2) Maritime Evergreen Forest	1) Loblolly pine, Red maple, Black cherry, Waxmyrtle, Blueberry. 2) Live Oak, Loblolly pine, Laurel oak, Black cherry, Am.Holly, Devilwood, blueberry, Jessamine.	Ground/herbaceous cover sparse.
Upland Mixed Woodland	1) Non-Riverine Pine-Hardwood Forest 2) Non-Riverine Wet Hardwood Forest	1) Loblolly pine, Red maple, Sweetgum, Pond pine, Sweetbay, Black tupelo, Red bay, Dog-hobble, Cane. 2) 6 Oak species, Hornbeam, Holly, blueberry, Dog-hobble, Cane, Chain-fern, sedges.	Flat seasonally perched water tables, with shallow depressions that hold water intermittently.
Reforestation Area	White Cedar, or Bald Cypress and oak spp.	White cedar, or Bald cypress, oaks & tupelos.	Manually planted in former agricultural fields.
Agriculture	Row Crops	Soybeans & corn	Tended to by local Refuge cooperative farmers, & private farmers.
Old Field	Mowed grasses; or Forbs, shrubs & saplings	Switchgrass, Goldenrod, Waxmyrtle, High Tide Bush & Loblolly pine, Red Maple, Sweetgum saplings	Refuge old fields are bush-hogged at least once every two years.

General Habitat	Vegetation Community(ies)*	Dominant Species	Comments
Dune Swale Wetland	1) Maritime Wet Grassland 2) Interdune Ponds	1) Saltmeadow cordgrass, rushes, sedges, goldenrod, asters, sundew, etc. 2) Bulrushes, grasses, spikerushes, cattail, Rose-mallow, Water hyssop	1) Graminoid dominated wetlands in dune swales. 2) Semiperm. flooded, herbaceous swales; ologohaline ponds.
Dune Grassland	1) Maritime Dune Grassland 2) Beach-Dune Grasslands	1) Am. Beachgrass, Sea oats, Seaside goldenrod, Evening primrose, Seaside spurge, Purple lovegrass, Sandbur, Saltmeadow cordgrass, Purple sandgrass 2) Beachgrass, Sea rocket	1) Ocean/bay-front dunes influenced by storm surges 2) Ocean-front beach from wrack-line to toe of dunes; sparsely vegetated
Back-dune Grassland	Maritime Dune Grassland	Am. Beachgrass, Sea oats, Seaside goldenrod, Evening primrose, Seaside spurge, Purple lovegrass, Sandbur, Saltmeadow	Shrublands along ocean-front dune, inland edges. Trees & shrubs often stunted.
Fresh-water Impoundment	1) Moist-soil units 2) Emergent Marsh** 3) Maritime Swamp Forest 4) Maritime Wet Grassland 5) Interdune Ponds	1) Eastern, higher elevation areas with high annual plant production (Beggars ticks, Water hyssop, spikerushes, smartweeds, wild millets, flat-sedges) 2) Black needlerush, arrowheads, Water lilies, 4 SAV species, Narrow-lvd. cattail, Pickerelweed, Am. lotus, spikerushes	880 acres of ten, intensively managed, man-made wetlands units; surrounded by earthen dikes to contain water at desired levels
Emergent Marsh	Wind-Tidal Oligohaline Marshes	Black needlerush, Narrow-lvd. cattail, Big cordgrass, Saltmeadow cordgrass, Rose mallow, Olney three-square, spikerushes, Dotted smartweed, Canada rush, Pickerelweed	Natural herbaceous wetlands of bayshore and island areas with no ocean tidal influence
Open Water	Submerged Aquatic Vegetation (SAV)	Several pondweed species, Coontail, Wild celery, milfoils, Widgeongrass, Muskgrass, Southern naiad	Most Bay waters are currently lacking SAV; except for several sheltered coves.

*(*from CCP Vegetation Community Types)*

*** The term is used loosely in this context to refer to a managed habitat that demonstrates many of the characteristics of an emergent marsh. Nonetheless, because emergent marshlands in their unaltered state are so prevalent in this region, the term is used as a General Habitat heading as well.*

In using this table as a reference, please note that a number of habitat types are seen in more than one location. This crossover of community classes is a result of nature responding similarly to similar conditions, the most telling of which are weather (determined by the wind-tidal system) and proximity to the ocean. It is for this reason that overlap exists, for some habitats cannot be strictly separated from each other.

Upland Habitats

These habitats are situated on higher elevation areas of the Refuge. They include: oceanfront beach, dunes, mixed hardwood-softwood woodlands, shrublands, agricultural farm land and old fields. Historic records show that the barrier beach system was severely over grazed in the 19th century, resulting in the mobilization of large sand sheets, and moving dunes. The cutting and

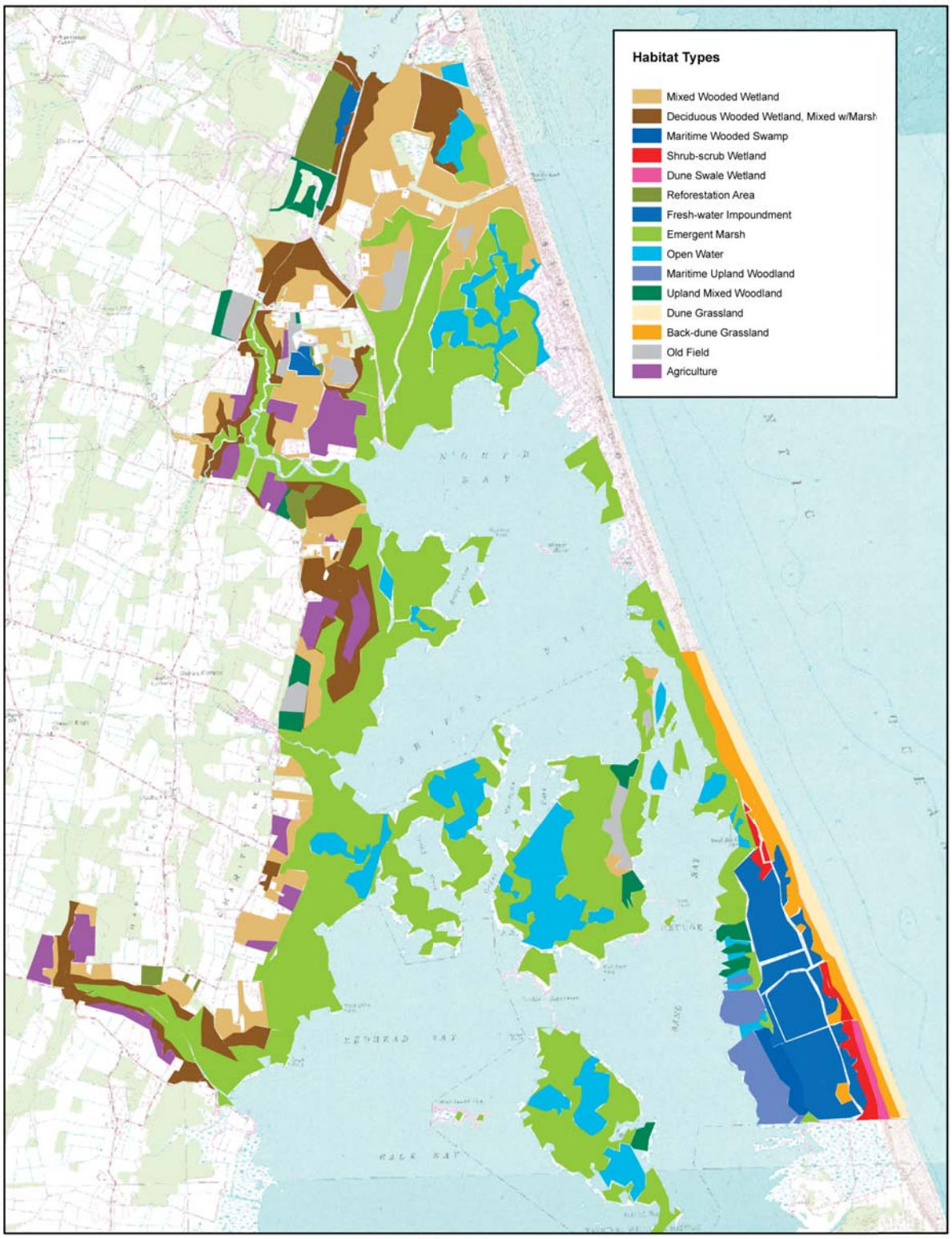
U.S. Fish & Wildlife Service

Draft Comprehensive Conservation Plan

Back Bay National Wildlife Refuge

Back Bay NWR Habitat Types

Map 3-1



Data Sources:
USGS digital orthographic data
USFWS refuge boundaries & other refuge information.

To be used for planning purposes only. December 2006.

BACK BAY NWR GIS LAB

0 0.5 1 2 Miles

0 0.5 1 2 3 Kilometers

Back Bay National Wildlife Refuge

burning of forested areas (particularly maritime forests) probably preceded the overgrazing. These forested areas have been culled many times, converting the vegetative composition of the area to its current state. Natural processes have also served to further shape the vegetative distribution and diversity on the barrier island portion of the Refuge. Depth to the water table, salt spray, substrate stability, water salinity, and periodic flooding have contributed to the existing vegetative communities' composition. The upland habitats can be divided into four types:

(1) *Beach-Dune Grasslands* — Beach vegetation is sparse, primarily located at the toe of the dunes in the wrack/debris line, and consists of sea rocket and American beachgrass. The higher dune lines are characterized by beachgrass and sea oats. In stabilized dune areas, the following species are common: sea rocket, wooly hudsonia, evening primrose, lobelia, seaside goldenrod, beach pea, sandspur, daisy fleabane and spurge. Stabilized and protected interdunal depressions develop an interesting diversity of plant species. The Refuge and adjacent False Cape State Park have listed 129 species of plants from such areas. Dominant species in these depressions include: saltmeadow cordgrass, rushes, common threesquare and broomsedge. Herbaceous plants include: water pennywort, centella and purslanes/seedboxes. Woody plants on the perimeters of wetter areas also include: groundsel, waxmyrtle, bayberry, black cherry and live oak.

(2) *Barrier Island Shrublands & Woodlands* — A shrub thicket exists along the bayshore peripheries, particularly along the western side of the barrier island, where the land is naturally or artificially protected from salt spray and overwash. The dominant shrubs and stunted trees of this community type are; waxmyrtle, highbush blueberry, American holly, yaupon, inkberry/low gallberry holly, groundsel/saltbush, red cedar and persimmon. Woody vines are also found in both the shrublands and adjacent woodlands, including: greenbriers, Virginia creeper, Japanese honeysuckle, grapes, poison ivy, trumpet creeper and false jessamine.

Shrub-thickets merge gradually into woodlands, particularly in the "Green Hills" area, north of False Cape State Park. These woodlands are generally low, reaching heights of 20 feet or less, due to the pruning effects of salt-laden winds from the ocean. Dominant species include live oak, loblolly pine, red cedar, laurel oak, red maple and sweetgum. A few pond pines can also be found in this area.

Additional upland woods are located on Long Island and the western side of Back Bay, on higher elevations. Long Island supports scattered hawthorns, and a mix of loblolly pine, waxmyrtle, hackberry, sweetgum, black cherry, persimmon, red cedar, groundsel/saltbush and a variety of oaks such as black and pin oaks.

(3) *Agricultural Farmland* — Elevations slightly below five foot mean sea level are often occupied by low-lying, poorly drained agricultural fields. In this area, agricultural lands were often previously occupied by lowland forests; but were cleared of all trees, ditched, and drained. Agriculture is the most abundant land use/vegetation type, which constitutes approximately 22% of the Back Bay watershed. Primary crops include corn, soybeans and wheat, while secondary crops consist of a variety of vegetables (Roy Associates, Inc. 1984). The farm fields which Back Bay NWR has acquired are managed under either a cooperative farming agreement, with planted crop, converted back to wetland through impoundment or wetland restoration projects, or reforested.

(4) *Old Fields* — Former agricultural fields that were purchased by the Refuge are sometimes permitted to serve the needs of Refuge songbird populations, including declining passerine species such as the field sparrow and yellow-breasted chat. These mid-successional old fields generally support a mix of young loblolly pine, waxmyrtle, groundsel/saltbush, mixed perennial grasses, blackberry briars, wooly beardgrass, and a variety of forbs. They are best managed through periodic prescribed burning fire or brush-hogging to maintain them at this successional state.

Wetlands Habitats — Marshes

Approximately 9,925 acres of wetlands are identified within the Back Bay watershed. These wetlands support a very diverse flora consisting of over 109 species. The five dominant species account for almost 75% of the wetland acreage. They include cattails (4,004 acres), black needlerush (2,371 acres), big cordgrass (605 acres), saltmeadow hay (449 acres) and switchgrass (427 acres). The remainder of the species represent a diverse mixture of brackish plants with a significant component of freshwater species (Priest III et al 1989).

Priest III et al (1990) describe the floral wetland communities as follows, "The emergent tidal wetlands are dominated by plants typically indicative of brackish conditions even though the system now tends toward freshwater conditions under normal circumstances . . . The brackish communities because of their continued dominance appear to be more adaptable to the periods of freshwater, than the freshwater species are to periods of brackish conditions. These historical oscillations between brackish and fresh conditions are probably responsible for much of the plant diversity found. These plant communities are not static either, as evidenced by changes in the coverage of common reed, *Phragmites australis*, which has increased substantially between this inventory done in 1977 and recent (1990) observations."

The above natural wetland estimates probably do not include the 900-acre Refuge impoundment complex on the barrier island portion of the Refuge; nor the 30-acre Frank Carter wetland restoration project on Colechester Road. Most of these freshwater impoundments consist of two general wetland habitats: moist soil and emergent marshes.

The moist soil areas are intensively managed areas along the eastern one third of A, B and C Pools in the 900-acre complex, and throughout most of the three impoundments in the Frank Carter site. These areas are flooded for 4-5 months and kept moist for most of the remaining 7- 8 months. They consist of sandier, slightly higher elevation, wet soils with an overlying organic layer that make them ideal for annual wetlands plant production. The sandier soils permit heavy agricultural equipment access for mowing, discing or root-raking; in order to maintain them in the early stage of plant succession needed for production of high seed yielding annuals such as beggar-ticks, bulrushes, sedges, smartweeds, wild millets, and succulents such as water hyssop, spikerushes, liliaeopsis, seedboxes, etc., that are preferred waterbird food-plants.

Emergent marsh areas principally exist along the western one-half to two-thirds of A, B and C Pools within the impoundment complex. They are usually managed to have standing water over them for 10 or 11 months of the year. These marshes consist of wetter, muckier substrates that principally accommodate perennial wetland plants. Several annuals also occur, including giant spikerush (*Eleocharis quadrangulata*) and a variety of SAV species (particularly *Myriophyllum* spp., *Potamogeton pectinatus, Ceratophyllum demersum*, and *Ruppia maritima*). Many perennials and nearly all of the annuals, particularly the SAVs, are good waterfowl foods. The more beneficial perennials include: arrow-arum, arrowheads, arrow-grass, Gibbon's panicgrass, fimbristylis, rice cut-grass,

saltmarsh bulrush, soft-stem bulrush, and to a limited extent, narrow-leaved cattail. Other perennials provide good cover, but little food value, and occupy significant acreage in the 900-acre impoundment complex. They include: black needlerush, saltmeadow hay, the invasive common reed, waxmyrtle and to a limited extent, narrow-leaved cattail. Management efforts aimed at reducing the density of these perennials are ongoing.

Several wetland sites on Long Island support unique Olney's three-square marshes and a floating spikerush marsh. They are the only known locations for these two unique marsh communities on Back Bay NWR, and thus, require protection.

Wetlands Habitats—Forested
Forested vegetative communities comprise approximately 11% of the watershed. Most of the upland forests are isolated stands surrounded by agricultural uses (Roy Mann Associates, Inc. 1984). Forested habitats within the Back Bay NWR include maritime evergreen, loblolly pine, mixed, non-riverine pine-hardwood and wet hardwood forests and estuarine fringe pine and swamp forests. According to the Natural Heritage Division of the Virginia Department of Conservation and Recreation, most of these communities range from globally rare to uncommon and rare to uncommon in the state of Virginia. The following forest types and species compositions are taken from Walton et al (2001).

(1) *Maritime Evergreen Forests* are located on back dunes and leeward sides of stabilized dunes. They are protected from the ocean salt spray and reach their northernmost limit along the southeast coast of Virginia. Dominant species include live oak mixed with loblolly pine, Darlington's oak and black cherry. The understory consists of poison ivy, common greenbrier, southern bayberry, American holly, devilwood, and highbush blueberry. Ground cover species are yellow jesamine and narrow-leaved golden-aster; dead oak leaves also contribute to the amount of ground cover.

(2) *Maritime Loblolly Pine Forests* are located on ocean-side dunes, bay-side dunes and sand flats that are usually protected from salt-spray. They are dominated by loblolly pine with an understory of dense red maple black cherry, and/or sassafras. Southern bayberry and highbush blueberry make up the shrub layer, while the herbaceous layer is sparse and low in diversity.

(3) *Maritime Mixed Forests* are located on leeward slopes of bay-side dunes or old ocean-side dunes. They are protected from salt spray and winds, and therefore, have a mix of loblolly pine, water oak, southern red oak and black cherry. The understory includes American holly, while the shrub and herb layers consist of common greenbrier and muscadine grape.

(4) *Maritime Swamp Forests* are seasonally flooded, or sometimes saturated, maritime wetland forests. These communities are within protected interdune swales or along sluggish streams inland from estuarine zones. They are characterized by hummock-and-hollow microtopography with seasonally standing water. Dominant species include red maple, sweetgum, blackgum, black willow and sweetbay. The shrub layer consists of highbush blueberries, southern bayberry, red bay, and greenbriers, while the herbaceous layers are dominated by Virginia chain fern.

(5) *Non-Riverine Pine*—Hardwood Forests are located in flat, seasonally perched water tables with frequent shallow depressions, which hold water intermittently. Dominant species are loblolly pine, red maple and sweetgum, with scattered pond pine. Other species include sweetbay, blackgum, red bay, and coastal dog-hobble. The shrub layer is typically dominated by giant cane, while the herbaceous layer is sparse.

(6) *Non-Riverine Wet Hardwood Forests* are located in flat, seasonally perched water tables and shallow depressions that hold water intermittently. Species vary regionally and may include swamp chestnut oak, cherrybark oak, willow oak, laurel oak, water oak, and pin oak. Intolerant trees, such as sweetgum and red maple may establish if oaks are cut or disturbed such as sweetgum and red maple for example. The herbaceous understory may include American hornbeam, giant cane, American holly, coastal dog-hobble and highbush blueberries. While the herbaceous layer consists of netted chain-fern and sedges.

(7) *Estuarine Fringe Pine Forests* are saturated coniferous maritime forests located in the back dunes of barrier islands and terrace flats further inland. The dominant canopy species is loblolly pine with southern bayberry, pond pine, inkberry, common greenbrier, poison ivy, cinnamon fern, royal fern, switchgrass and smartweeds. Giant cane may also be present.

(8) *Estuarine Fringe Swamp Forests* are mixed forests subject to irregular wind-tidal flooding. The water table salinity fluctuates between fresh (0 ppt) and 5 ppt., and usually borders wind-tidal marshes. Dominant canopy species include bald cypress, swamp tupelo, and loblolly pine. The understory consists of sweetbay and redbay while the shrub layer is southern bayberry. Royal fern dominates the herbaceous layer.

Wetland Habitats — Impoundments

In the 1930's, a dune system was created along the beach edge. The Civilian Conservation Corps built brush fences and planted cane and bulrush to catch the blowing sand. Later on, beachgrass was planted to stabilize the dunes. This protected the bayside flats and by the 1970's, Back Bay NWR converted approximately 650 acres of mostly unvegetated wash flats to freshwater impoundments.

These impoundments evolved from a simple "ring dike"system with 3 units, to an efficient, manageable system that includes 10 units with two storage pools, water control structures and a water pump that allows water levels to be altered throughout the year. Wildlife management of this area involves surveys of population size and species diversity to determine use trends; together with the control of undesirable species and encouragement of desirable species, through mechanical, chemical and aquatic habitat management tools. Habitat management techniques include discing, root raking, mowing, burning, invasive species control and water level manipulations. During the spring and fall, the Refuge draws down pool water levels to provide migrating shorebirds with exposed mud flats rich in invertebrates. Pool levels are gradually raised in the fall and winter to flood the various rushes, sedges, smartweeds, bacopa, millets, etc. to feed wintering and migrating waterfowl.

The impoundments include *A-pool, B-pool, C-pool, D-pool, E-pool, G-pool, H-pool, J-pool* and two water storage pools, *C-Storage* and *B-Storage Pools.*

A-pool.	*A-pool* is the most southern and largest impoundment, containing **215 acres**. One hundred and ninety-three acres are emergent wetlands, 10 acres are upland (along the southeastern side), and 12 acres are wooded swamp (along the western side). Deep-water ditches run along the northern and southern ends; they are connected by two shallow 'Gemco' ditches that run north to south.
B-pool	*B-pool,* located between A and C pools, is approximately **100 acres**, of which 96% is emergent wetlands. The highest ground is located on several tiny islands in the mid-eastern portion of the pool.

C-pool	The second largest impoundment is *C-pool*, which consists of **190 acres** of emergent marshes, open water and higher-elevation islands along the eastern side and deep-water ditches.
D-pool	*D-pool* is currently designated for recreational fishing activities. This **17-acre** unit supports upland grasses, waxmyrtles and small patches of three-square and black needlerush. The interior perimeter consists of a wide, deep-water ditches that support a viable game-fish population. Areas adjacent to the deep-ditch are shallower to support spawning and bait-fish/prey populations.
E-pool	*E-pool* is approximately **25 acres**. It is dominated by upland grasses in the southern half, and by three-square and diverse emergent wetland plants in the northern half.
G-pool	*G-Pool's* **88 acres** consist of a mix of lower elevation wetlands, and higher elevation, dune-associated habitats. A deep-water ditch exists along the eastern side. Prior thoughts on letting this unit revert to shrub-scrub have been abandoned since wintering waterfowl use has begun to increase.
H-pool	*H-Pool* consists of **76 acres** of mixed wetlands and higher elevation dune grasslands. A deep-water ditch exists along the eastern side. G, H and J Pools are also referred to as "dune pools" since they were reclaimed from former dune habitat in 1993. As with the other two "dune pools," H-Pool's wetlands are dominated by common threesquare, black needlerush, spikerushes and wild millets; while the higher elevation areas are dominated by live oaks, southern waxmyrtle and switchgrass.
J-pool	*J-pool* is **111 acres,** with 33 acres containing wooded swamp, and the remainder a mix of wetlands and higher elevation, dune-associated habitats. Three-square and black needle rush dominate the remaining wetlands, while live oak and waxmyrtle represent the upland.
C-storage pool	*C-storage pool* is the main water storage unit. It contains approximately **45 acres**. A 12,000 gallon per minute pumping station is located on its West Dike. The station pumps water from Back Bay into this Unit from where it is distributed to other surrounding impoundments via connecting water control structures. C-storage pool is nearly all open water, with the shallower eastern side supporting some emergent wetland and scattered "islands" with waxmyrtles and live oaks.
B-storage pool.	*B-storage pool* is approximately **13 acres** of deep-water ditching emergent wetland and mixed forest. A small four acre remnant mixed hardwood and softwood forest is along the southern end. Emergent wetland plants include: pondweeds, bladderwort, red-rooted nutsedge, smartweed, beggarticks, black needlerush and water primrose.

Islands and Marshy Peninsulas
The Refuge currently owns approximately 2,400 acres of bay islands. This includes the marsh fingers to the west of B-storage, C-storage, C-Pools, as well as Long Island, Ragged Island and all other unnamed islands. Most of these islands are washed over by the bay, and therefore severely eroded.

Long Island is approximately 800 acres. This includes 55 acres of old fields that are slowly reverting back to woodland and 50 acres of mixed loblolly pine-red-maple forest. The remaining acreage consists of emergent black needlerush marshes, ponds, small guts and inlets.

Ragged Island is the next largest bay island and is approximately 700 acres of emergent needlerush marshes, scattered waxmyrtle and open water or "potholes." The remaining 900 acres of bay islands and marsh fingers are emergent needlerush marshes, open water coves, waterways and potholes, interspersed with phragmites stands, waxmyrtle and three-square.

Other Non-forested Habitats
Other vegetative communities include maritime dune grasslands, maritime scrub, maritime wet grasslands, maritime shrub swamps, interdune ponds, wind-tidal oligohaline marshes, upper beaches, overwash flats and SAVs. According to the State of Virginia, most of these communities are globally uncommon to rare in Virginia. The following habitat types and species compositions are taken from Walton et al. (2001).

(1) *Maritime Dune Grasslands* are coastal communities of ocean/bay-fronting dunes influenced by storm surges. Dominant species include saltmeadow

cordgrass, American beachgrass, sea oats, and seaside little bluestem. Low cover species consist of seaside goldenrod, sea-beach evening-primrose, seaside spurge, purple lovegrass, purple sandgrass and dune sandbur.

(2) *Maritime Scrub* are shrubland communities that occupy inland edges of maritime dune systems that are sheltered from constant ocean salt spray. Species are usually stunted and include dominant northern bayberry, live oak, persimmon, and black cherry. Canopy gaps will support species found in dune grasslands such as dwarf shrub sand-heather, beach goldenrod, bitter beach grass, Gray's flatsedge, and beach pinweed.

(3) *Maritime Wet Grasslands* are graminoid-dominated seasonal wetlands within maritime dunes. Dominant species are saltmeadow cordgrass, rushes and/or sedges. Other species include slender goldenrod, long-leaved aster, yellow-eyed grass, dwarf umbrella-sedge, ladies'-tresses, spoon-leaved sundew and others.

(4) *Maritime Shrub Swamps* are seasonally flooded shrublands of sheltered maritime dune hollows. This habitat typically holds fresh water, throughout most of the year though saltwater may be present after storm surges. Species include southern bayberry, inkberry, highbush blueberry, poison ivy, royal fern, marsh fern, netted chain fern, Virginia chain fern and whorled water-pennywort.

(5) *Interdune Ponds* are seasonally to semi-permanently flooded, maritime herbaceous wetlands in interdune basins and swales. This group includes freshwater and slightly brackish ponds or best characterized as oligohaline ponds. The community composition depends upon the geography, topography, exposures to storm surges and salt spray, hydroperiod and soil properties. Seasonally flooded freshwater ponds contain bulrushes, grasses and/or squarestem spikerush, while seasonally flooded oligohaline ponds may be dominated by narrow-leaved cattail, eastern rose-mallow, and/or saltmarsh bulrush. Semi-permanently flooded oligohaline ponds consist of coastal water-hyssop, white spikerush, and sago pondweed.

(6) *Wind-Tidal Oligohaline Marshes* are herbaceous wetlands subject to wind-tidal flooding along estuaries that no longer have oceanic influences. The water regimes of this group ranges from fresh to brackish (5ppt). Therefore, there is usually a mixture of freshwater and saltwater species. Tall marsh graminoids such as big cordgrass, black needlerush and cattails are common, though in patches. However, more diverse tall marshes with big cordgrass, sawgrass, switchgrass, marsh horned beakrush, eastern rose-mallow also occur. Short statured marshes are usually more locally distributed and include creeping spikerush, beaked spikerush, twigrush, Olney three-square, pickerelweed, dotted smartweed and Canada rush.

(7) *Upper Beaches and Overwash Flats* are sparsely vegetated habitats that are situated behind breached foredunes just above the mean high tide line, but are flooded during spring tides and storm surges. Common species include American searocket and Russian-thistle. Other species are Sea-purslane, Sea-beach knotweed, Bushy knotweed, sea-blites and Sea-beach orach.

(8) *Submerged Aquatic Vegetation (SAV)* is an important aspect to a healthy ecosystem in Back Bay. SAVs provide important habitats and support a greater diversity of wildlife species, help to stabilize sediments, deter shoreline erosion and filter pollutants and dissolved nutrients. SAV in Back Bay has shown periods of noticeable peaks and declines since the 1920's; with two periods of high frequency and two declines between 1954 – 1990.

Disease, run-off, changes in salinity, turbidity, weather and various natural occurrences are causes for the decline of SAVs (Schwab et al. 1990).

Threatened or Endangered Plants

According to the Virginia Natural Heritage Division, there are no Federal or State listed plant species on Back Bay NWR. However, rare to uncommon species have been recorded on the Refuge (Table 3.2).

During 2000, an inventory of Refuge habitats was carried out in search of rare plant and animal species by Virginia Department of Conservation and Recreation's Division of Natural Heritage. The resulting technical report #01-8 (Walton et al. 2001) details historic and current sightings of rare plant species on pages 18 to 20. Many of the following plants were reported prior to the 2000 inventory, but not observed then principally because of a lack of field time to adequately explore the habitats these species were observed in previously. It is likely that some of these species are still present in the indicated areas.

Table 3.2. Rare Plants Recorded in the Back Bay NWR (Source: Walton et al. 2001)

Taxon	Common Name	Last Seen
Eleocharis vivipara	viviparous spikerush	1973 (Black Gut)
Ludwigia brevipes	long beach seedbox	1988, 1990, 1991, 2000 (Black Gut, south end of impoundments & E-Pool)
Crataegus aestivalis	May hawthorn	1939
Juncus elliotti	bog rush	1939, 1947
Juncus megacephalus	big-headed rush	1939, 1988, 2005-2006 (Impoundments)
Lilaeopsis carolinensis	Carolina lilaeopsis	1939,1992-2006 (east impoundments, bayshores)
Rhynchospora colorata	white-topped sedge	1939, 1965, 1988, 2003-2006 (Impoundments & eastern Long Island)
Ludwigia alata	winged seedbox	1991, 2000 (Long Island & North Bay Marshes)
Erigeron vernus	white-top fleabane	1988, 2000 (Impoundments & dune swales nr. D & E Pools.)
Iva imbricata	sea-coast marsh-elder	1939
Ludwigia repens	creeping seedbox	1988 (Impoundments)
Phyla nodiflora	common frog-fruit	1947, 1988 (Impoundments)
Rhynchospora debilis	savannah beakrush	1952
Rhynchospora fascicularis	fasciculate beakrush	1988 (South end of Impoundments)
Vaccinium macrocarpon	large cranberry	1988 (Impoundments)
Verbena scabra	sandpaper vervain	1939, 1947
Hydrocotyle bonariensis	coastal water-pennywort	2000 (Dunes east of Refuge entrance road.)
Lipocarpha maculata	American lipocarpha	2000 (South end of Impoundments)

Taxon	Common Name	Last Seen
Tillandsia usneoides	Spanish moss	1946
Cladium jamaicense	sawgrass	prior 2000 (southern G-Pool)
Paspalum distichum	joint paspalum	2000-2006 (Impoundments)
Paspalum dissectum	A paspalum	1995-2004 (A, B & C Pools)
Aster puniceus	Elliott's aster	Prior to 2000
Calopogon pallidus	pale grass-pink	prior to 2000
Carex reniformis	reniformis sedge	prior to 2000
Chamaesyce bombensis	southern beach spurge	prior to 2000
Chrysopsis gossypina	cottony golden-aster	prior to 2000
Desmodium strictum	pineland tick-trefoil	prior to 2000
Eleocharis halophila	salt-marsh spikerush	prior to 2000
Eleocharis radicans	rooted spikerush	prior to 2000
Fimbristylis puberula	hairy fimbry	prior to 2000
Heliotropium curassavicum	seaside heliotrope	prior to 2000
Hottonia inflata	featherfoil	prior to 2000
Hypoxis sessilis	glossy-seeded stargrass	prior to 2000
Juncus abortivus	pine barren rush	prior to 2000
Limosella australis	mudwort	prior to 2000
Lobelia elongata	elongate lobelia	prior to 2000
Physalis walteri	dune ground-cherry	prior to 2000
Quercus hemisphaerica	Darlington's oak	prior to 2000
Quercus incana	bluejack oak	prior to 2000
Schoenoplectus acutus	hard-stemmed bulrush	prior to 2000
Ranunculus hederaceus	ivy-leaved water crowfoot	prior to 2000
Sparganium androcladum	branching burreed	prior to 2000
Utricularia striata	fibrous bladderwort	prior to 2000
Wolffia columbiana	Columbia watermeal	prior to 2000

Unique Ecosystems

The State of Virginia's Natural Heritage Division has designated certain areas of the Refuge as Natural Areas because of their intact and unique natural environments. These areas include North Bay Marshes, Black Gut, Muddy Creek, Porpoise Point and Nanney Creek.

The North Bay Marshes Natural Area and Black Gut Natural Area include Hell Point Creek, Black Gut, a series of large, connected marsh potholes, and acreage on both sides of eastern Sandbridge Road. The 2,020 acres include emergent needlerush marshes, potholes, bottomland woodlands, and agricultural and old fields. The North Bay Marshes Natural Area contains the rare plant winged seedbox while the Black Gut Natural Area contains Carolina fimbristylis, long beach seedbox and viviparous spikerush. This area also holds rare bird and insect species such as the king rail and least bittern and the saffron skipper and stripe-winged baskettail.

The Muddy Creek Natural Area contains approximately 400 acres along both sides of Muddy and Asheville Bridge Creeks. The Porpoise Point Natural Area includes 780 acres between Beggar's Bridge Creek and Porpoise Point. The habitats for these two Natural Areas include emergent needlerush marshes, potholes, lowland woodlands and agricultural and old fields. The Muddy Creek Natural Area holds rare species such as Carolina liliaeopsis (a rare plant in Virginia) and crow-poison. Porpoise Point Natural Area contains elongated lobelia and winged seedbox. Nanney Creek Natural Area contains 610 acres of wetlands on both sides of Nanney Creek, and also holds Carolina liliaeopsis.

Diversity of Plant Communities

The Back Bay region is unique for the occurrence of many rare plants at their extreme limits, either north or south. The presence of these uncommon to rare species make the vegetation of the Back Bay region a unique component of the state flora (Knepper et al 1990).

The following northern species exist on the Refuge and are near their southernmost limit:

Limosella subulata (a mudwort)
Cyperus engelmanii (Engelman's bulrush)
Eleocharis halophila (salt-marsh spikerush)
Cyperus haspan (a bulrush)
Dichromena colorata

The following southern species exist on the Refuge and are near their northernmost limit:

Liliaeopsis carolinensis (Carolina liliaeopsis)
Cladium jamaicense (Sawgrass)
Eleocharis radicans (a spikerush)
Arenaria lanuginosa (a sandwort)
Physalis viscosa (unknown common name)
Lippia nodiflora (a frog-fruit)
Bacopa monnieri (a water hyssop)
Erigeron vernus (a fleabane)
Iva imbricata (a marsh-elder)
Juncus megacephalus (big-headed rush).
Quercus virginiana (Live oak)
Pinus serotina (Pond pine)
Taxodium distichum (Bald Cypress)

Noxious Weeds

The Common reed (*Phragmites australis)* is the primary invasive in the Back Bay watershed. This invasive is a substantial threat to the watershed's marsh flora. It quickly invades disturbed wetlands forming extensive dense stands that exclude native species (Ludwig et al. 1990). Species diversity is also minimized, thereby negatively effecting the quality of habitat for wildlife species.

The Virginia Institute of Marine Science (VIMS) documented a five to ten-fold increase in the percent cover of common reed between 1977 to 1990 (Clark 1997). During one of their low level overflights in 1990, VIMS estimated an average 10 % cover of Phragmites within the Back Bay watershed. One explanation for the wide spread of this invasive grass was the large scale dredging and filling projects during the 1960s and early 1970s. These activities provided sufficient disturbance to the natural flora for common reed to become well established. Since then, its aggressive growth habits have allowed it to continue spreading and out-compete the native vegetation (Priest III et al. 1990).

The Refuge has been actively controlling Phragmites reed since 1987 through aerial and ground applications of Glyphosate-based herbicides (Rodeo," "Glypro" and "Aqua-Neat") approved for use in wetlands. Dense stands of dead Phragmites stems have been removed by controlled burns to promote the growth of native and more desirable species. Glyphosate applications, followed by burning of the dead stand, have been successfully used in the impoundments, and most recently on Long Island.

Japanese stiltgrass is wide-spread in woodlands and woodland edges of the Back Bay Refuge. It is an annual grass native to Asia, India and Japan. It invades naturally (via flood scouring) and artificially (via mowing, tilling, etc.) and quickly displaces native vegetation. It then degrades quality nesting habitat for quail and other wildlife. Japanese stiltgrass is shade tolerant and prefers moist and well-drained soils. Once Japanese stiltgrass is established, control methods, such as mechanical, manual, environmental (flooding or burning) and chemical can be used at varying degrees (Tu 2000).

Biological Environment— Wildlife

Wildlife Habitat

The Back Bay NWR environment consists of several, unique high-quality habitats. The oligohaline nature of the Back Bay ecosystem has resulted in the unique establishment of various freshwater, wetland communities in bay areas behind the oceanfront, barrier island, that are normally very brackish. In addition, the geographic, "mid-way location" of Back Bay along the East Coast, places it in the overlap area at the extreme range limits of many northern and southern plant and animal species.

Birds

The unique diversity of Refuge habitats results in a high diversity of migratory birds, particularly during their spring and fall migrations. Migratory birds are broken down into categories of waterfowl, wading birds, shorebirds, gulls, terns, marsh birds, raptors and passerines.

Waterfowl — The variety of wetlands habitats within and adjacent to Back Bay attract 17 duck species, including mallard, black duck, gadwall, widgeon and pintail, Canada goose, snow goose, and tundra swan. Lesser numbers of wood duck, shoveler, bufflehead, ruddy duck, hooded merganser and ring-necked duck

and lesser scaup also migrate through and/or winter within the impoundment complex, coves and natural potholes of the Back Bay watershed. Just offshore, along the Atlantic Ocean-front, the red-throated and common loons, horned and red-necked grebes, several scoter species and the red-breasted merganser feed and rest during their spring and fall migrations.

Wintering waterfowl population size is correlated with that year's SAV production in the bay. High SAV production usually results in high wintering populations (Figure 3.9). However, SAV has been declining for many decades, which in turn results in one of the causes of low waterfowl populations. The following graph indicates this close relationship between SAV and waterfowl populations (Settle and Schwab 1991).

Figure 3.9. Total Waterfowl and % Frequency of Submerged Aquatic Vegetation (SAV).

In general, waterfowl populations of various species have been declining at Back Bay for at least a half-century. The reasons for this are complex and may be separated into local and regional factors. Local factors include reductions in SAV, which may link to potential decreases in water quality. However, some water quality elements (such as nitrates and suspended solids) in Back Bay have been improving over the past two decades while SAV level remain low. This indicates a more complex relationship between waterfowl, SAV and water quality. Regional factors in decreasing Back Bay waterfowl populations may include the shifting of primary over-wintering locations in the Atlantic Waterfowl Flyway, primarily northward, out of the Back Bay area; as well as overall declines in Atlantic Flyway populations.

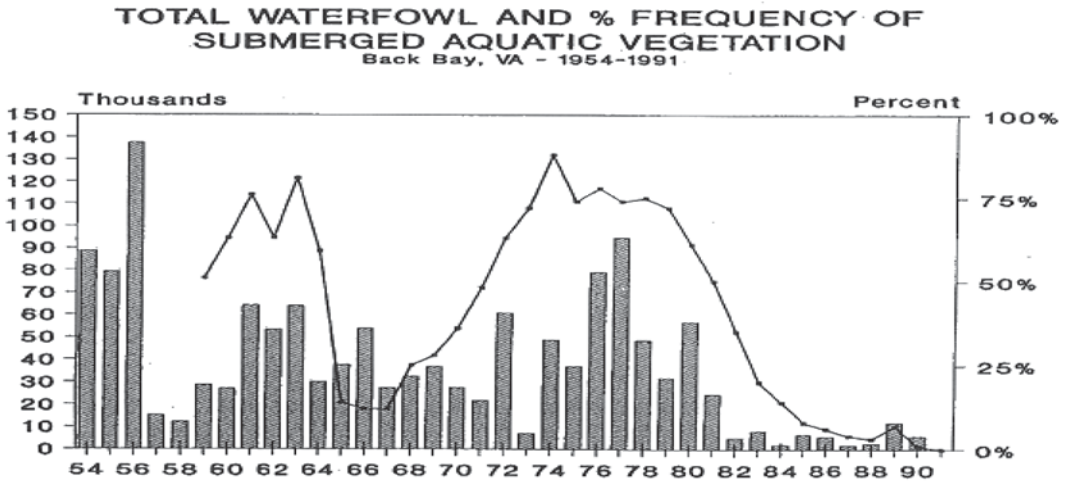
The following table summarizes these main temporal trends of waterfowl species in a local and regional context (Table 3.3). Out of the eighteen primary waterfowl species occurring in Back Bay, eight have decreased, two increased, two are variable or stable, and the remaining six have insufficient data to determine long-term trends. These trends assume no errors or misrepresentations inherent in the collection of data. Inconsistencies in sampling methods do occur between the VA-MD-NC data from the Atlantic Flyway Mid-Winter and the Audubon Christmas Bird Count surveys.

The trends for nine waterfowl species are provided in the following series of nine graphs (Figure 3.10 to 3.18). Back Bay NWR (BKB, solid squares, right axis) numbers are compared to Atlantic Flyway Mid-Winter Survey numbers (AF-MWS, broken line, right axis) and Virginia-Maryland-North Carolina National Audubon Society Christmas Bird Count numbers observed per hour (VA/MD/NC-CBC, open diamonds, left axis). All graphs, for each geographic location, indicate declining populations since about 1960. The exceptions are geese and swans, which show increasing populations at the Atlantic Flyway geographic level.

Wading birds — Wading bird populations vary with the season. Most species are present only during their migrations and throughout the summer. The only exception is the great blue heron, which can be seen year-round. Common waders include the great and snowy egrets, the great blue, little blue and tricolored herons, and the glossy ibis. The white ibis, American bittern, least bittern, green-backed and black-crowned night heron are also present, but in lesser numbers. Impoundment water levels are drawn down during July to provide additional fish and amphibian forage for these birds, particularly young of the year, prior to their migrations.

Table 3.3. Regional Waterfowl Summaries—trends over time and space

	1960-2000	1959-1993	1940-2003	1955-2003	1955-2003	ATLANTIC FLYWAY SHIFT (1955-2003)			
	BACK BAY[1]	CHESAPEAKE[2]	VA-MD-NC[3]	VA-MD-NC[4]	ATL. FLYWAY[4]	Northward[4]	Southward[4]	From	To
SWANS AND GEESE									
Snow Goose	v	^	v	^	^	YES		MD-VA-NC	NJ-DE



	1960-2000	1959-1993	1940-2003	1955-2003	1955-2003	ATLANTIC FLYWAY SHIFT (1955-2003)			
	BACK BAY[1]	CHESAPEAKE[2]	VA-MD-NC[3]	VA-MD-NC[4]	ATL. FLYWAY[4]	Northward[4]	Southward[4]	From	To
Canada Goose	v	^	v	–	^	YES		MD-VA-NC	NJ-DE
Tundra Swan	v	–	v	^	^		YES	MD	NC
DABBLING DUCKS				v	v				
American Wigeon	v	v	v	v	v	YES		SC-GA-FL	MD-VA-NC-DE-NJ

	1960-2000	1959-1993	1940-2003	1955-2003	1955-2003	ATLANTIC FLYWAY SHIFT (1955-2003)			
	BACK BAY[1]	CHESAPEAKE[2]	VA-MD-NC[3]	VA-MD-NC[4]	ATL. FLYWAY[4]	Northward[4]	Southward[4]	From	To
American Black Duck	v	v	v	v	v	YES		MD-VA-NC	NJ-DE
Mallard	–	^	v	–	v	YES		SC-GA-FL	MD-VA-NC-DE-NJ
Northern Pintail	v	v	v	v	v	YES		SC-GA-FL	MD-VA-NC
Green-winged Teal	–	–	v						
Gadwall	v	–	v						
Wood Duck	^		v						
Northern Shoveler	?	–	v						
DIVING DUCKS				–	v				
Ruddy Duck	?	v	v						
Redhead	?	v	v						
Canvasback	?	v	v	v	v				
Scaup spp.		–	v	–	v				
DIVING DUCKS *(cont.)*				–	v				
Bufflehead	?	^	^						
Ring-necked Duck	?	–	v						
OTHER DUCKS									
Hooded Merganser	^	^	^						
American Coot	v		v						

Sources:

1 *Back Bay NWR Waterfowl Survey Data*

2 *Edward Pendleton. Natural Resources in the Chesapeake Bay Watershed http://biology.usgs.gov/s+t/noframe/m4148.htm*

3 *National Audubon Society Christmas Bird Count Data*

v *Decreasing*
^ *Increasing*
– *Stable/Variable*
? *Insufficient Data*

[4] *Atlantic Flyway Mid-Winter Waterfowl Survey, Office of Migratory Bird Management, Laurel, Maryland, http://mbdcapps.fws.gov/mwsoptions.asp*

[5] *Waterfowl Population Status, 2003, http://migratorybirds.fws.gov/reports/reports.html*

Figure 3.10. Regional Snow goose populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

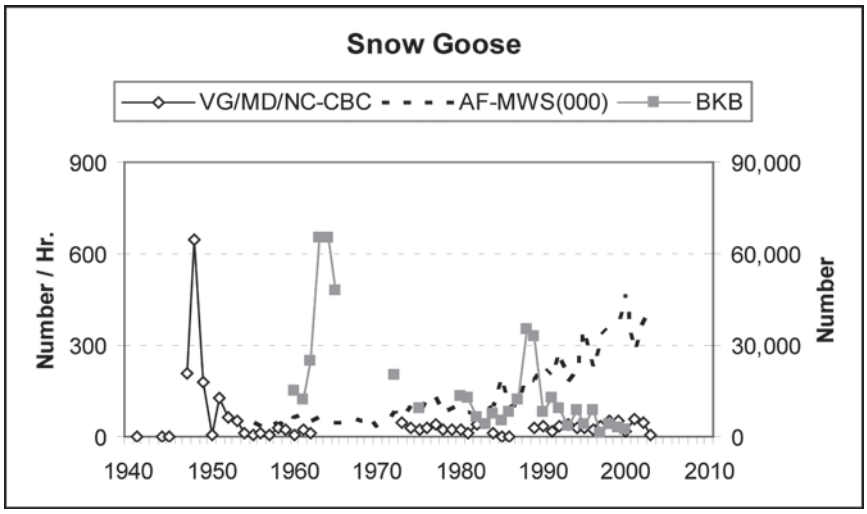


Figure 3.11. Regional Canada goose populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

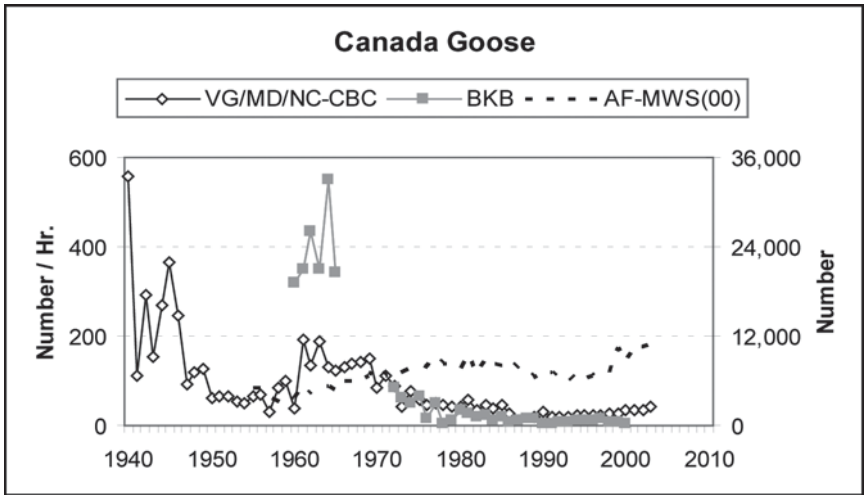


Figure 3.12. Regional Tundra swan populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

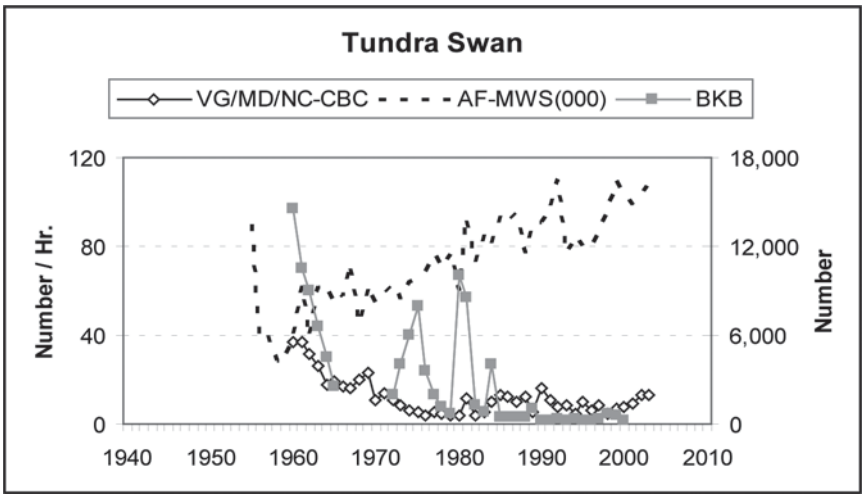


Figure 3.13. Regional American Wigeon populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

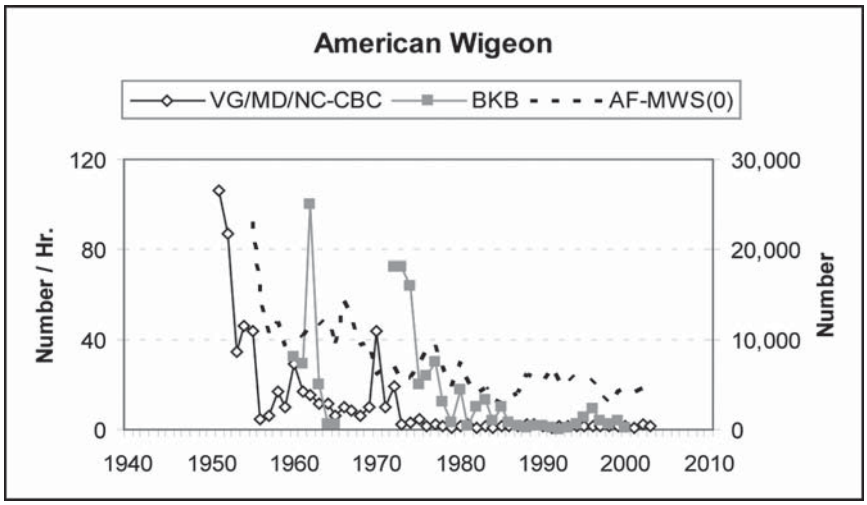


Figure 3.14. Regional Black duck populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

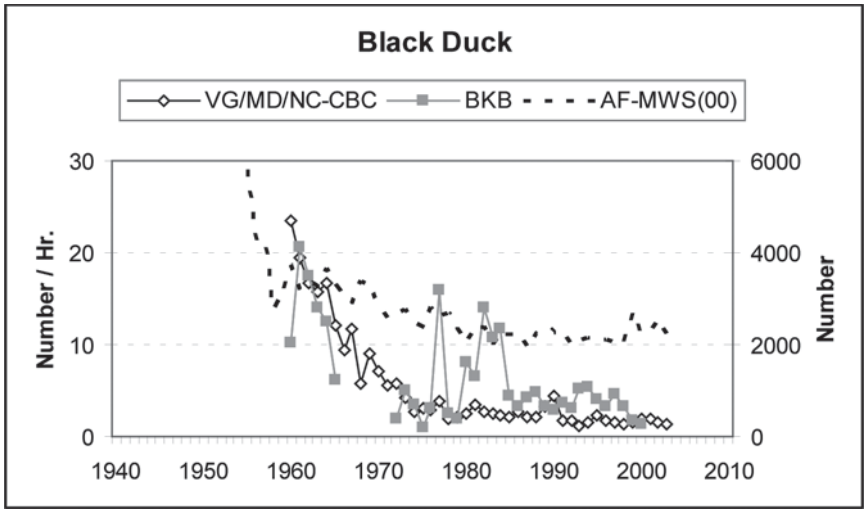


Figure 3.15. Regional Mallard populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

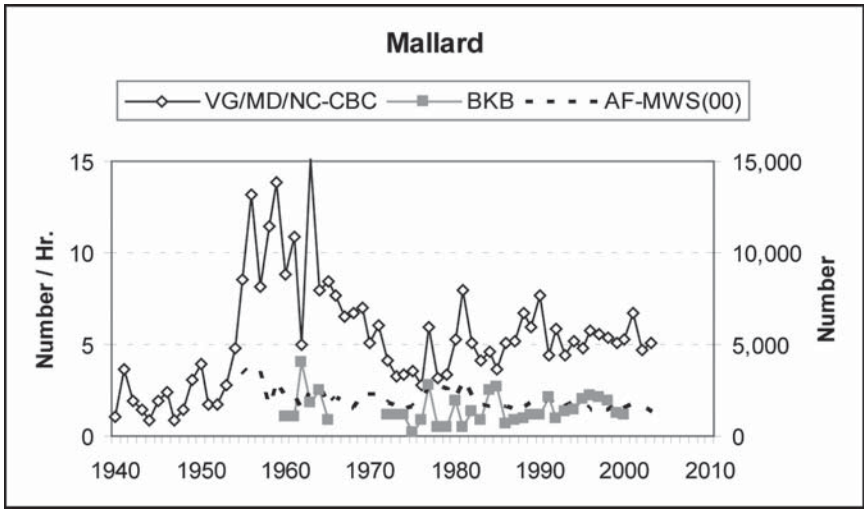


Figure 3.16. Regional Northern pintail populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

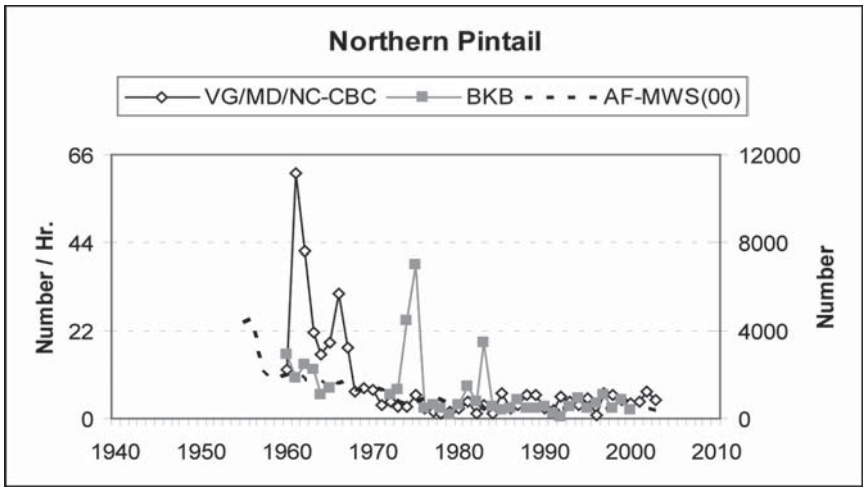


Figure 3.17. Regional Green-winged teal populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)

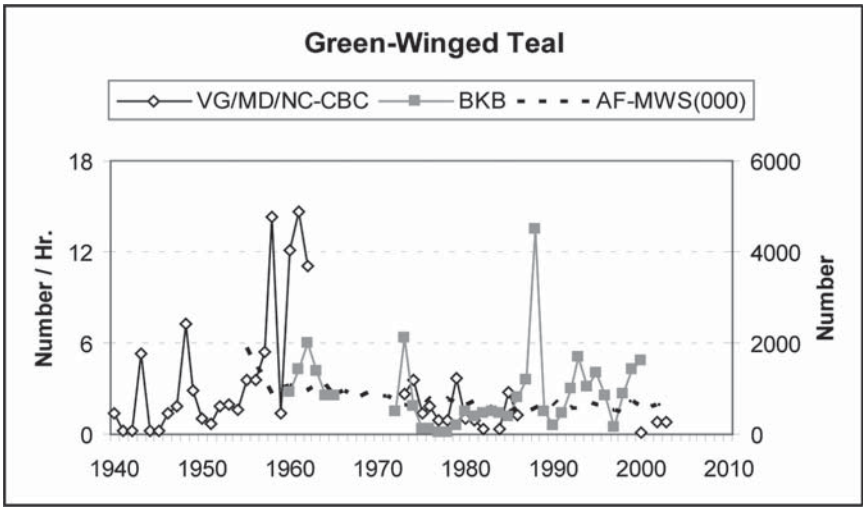
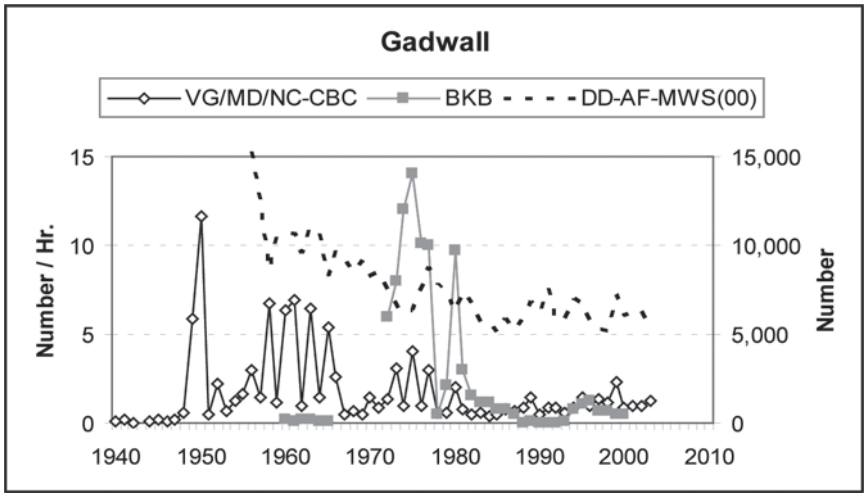


Figure 3.18. Regional Gadwall populations—trends over time and space (*VG = Virginia, MD = Maryland, NC = North Carolina, CBC = Christmas Bird Counts, AF-MWS= Atlantic Flyway -Mid-Winter Waterfowl Survey, BKB = Back Bay National Wildlife Refuge*)



Shorebirds — Refuge shorebirds include the sandpipers, plovers, dunlins, knots, yellowlegs, dowitchers, and sanderlings. They utilize the wet mud/sand flats and beach tidal habitats; where they search for the high-protein, invertebrate foods they need to sustain them during their exhausting migrations. They use the Back Bay Refuge beach and impoundments vicinities most during their spring and fall migrations. The Refuge draws down the water levels of its 880 acre impoundment complex to provide them with additional feeding areas during those periods. The most common species using the Refuge then are: the sanderling, greater and lesser yellowlegs, semipalmated sandpiper, semipalmated plover, short-billed dowitcher, snipe, black-bellied plover and willet. Lesser numbers of the spotted sandpiper, whimbrel, dunlin, red knot, western sandpiper, killdeer, and least sandpiper are also regularly seen then. Occasional sightings of the black-necked stilt and piping plover occur.

Gulls, Terns, etc. — Most birds in this group are found along the Refuge oceanfront beach during the spring and fall migrations, although several species venture further west into the impoundment complex and Back Bay. During the summer and winter, use of the Refuge by birds in this group declines sharply. Common species present during the spring and fall migrations include the ring-billed, laughing, herring, and great black-backed gulls, the royal, Forster's, Caspian, common and least terns, and the double-crested cormorant. Offshore, large numbers of common and red-throated loons, horned and red-necked grebes, northern gannets, and brown pelicans migrate through during the early spring of each year. Their migrations often coincide with food fish movements, to create an interesting feeding spectacle for birding enthusiasts. The brown pelican continues to roost on, and fly over, Refuge beaches throughout the summer

and fall; while the pied-billed grebe prefers to use shallow impoundments and backwater ponds/potholes within more interior wetlands.

Marshbirds — This secretive group of birds includes the rails, gallinules, moorhens and coot. Common Refuge residents include the king, Virginia and sora (during their migrations only) rails, the common moorhen, least bittern, and the American coot. Less common species include the purple gallinule and yellow rail. Marsh birds are surveyed in two Refuge areas during the spring and summer by an expert birding contractor, using an established FWS survey protocol. Surveys have been carried out in the Impoundment Complex and North Bay Marshes for the last 6 years to monitor rail and bittern population trends. Data reveal that large populations of least bitterns are using the wetlands around a canal that runs from Sandbridge Road to Hell Point Creek during their breeding season. There is a unique combination of Phragmites reed deadfall, resting atop black needlerush that results in an elevated "debris platform" throughout much of the area. This unique vegetative structure may encourage higher densities of these birds to nest here. In addition, this same area has moderate use by sora rails during the spring migration, but no use by this rail species during the nesting season. King rails are the most common rail species picked up in both the North Bay Marshes and the Impoundment Complex during these surveys.

Raptors — Common raptors on the Refuge include the following hawks: the northern harrier, osprey, American kestrel and sharp-shinned and Cooper's hawks. The red-tailed and red-shouldered hawks are occasionally present during the spring and fall migrations. Common owls are: the great horned and eastern screech. The most common raptors during the spring and fall migrations, are the sharp-shinned hawk and kestrel. An active bald eagle nest has existed, and fledged young, within the northern portion of Back Bay NWR since 1993. The osprey and northern harrier are the more numerous raptors at Back Bay NWR. The osprey nests on both artificial nesting platforms and nearby trees. Since the Bald eagle population began increasing in Back Bay during the late 1990's, there seems to be a reduction in osprey use of nesting platforms, and an increase in natural tree nests along bay shorelines. Whether this contributed to their loss of interest in platform use, as a result of the failed nests detailed in the following observations, or not, is unknown. Their breeding population had been fairly stable until 2001, when a sudden decline in the production of nest platforms production became apparent. Failures of nests with eggs and young in them were observed during June banding and final production checks, in 2001 and 2002. Predation by great horned owls and crows is suspected.

Passerines — Otherwise referred to as songbirds, this very large group of migratory birds includes the warblers, woodpeckers, sparrows, flycatchers, swallows, blackbirds, wrens, thrushes, vireos, and finches. The Refuge bird list provides a total of 155 passerine species that use Back Bay NWR. Point counts have been used to gather a baseline passerine population inventory and distribution information from the mid 1990s through 2003. These surveys revealed that Long Island supports one of the few breeding populations of seaside sparrows in this area; and that shrub-scrub habitats immediately west of the barrier island's sand dunes, support the highest density and diversity of songbirds during their spring migrations. Two bluebird trails provide limited support for nesting bluebirds south of Sandbridge Road, and prothonotary warbler nestboxes were placed on red maples of the Green Hills area to encourage nesting by this unique warbler. However, a 2004 cost-benefit analysis revealed that nestbox use by the bluebird and Prothonotary warbler was so low (1-3 nests per season), that it was not feasible to continue those nestbox programs.

Mammals

Common mammals that use Back Bay Refuge include the gray and red fox, raccoon, opossum, weasel, eastern cottontail and marsh rabbit, and white-tail deer. Common small mammals include the gray squirrel, rice rat, and a variety of mice, voles, shrews, and bats. The rare eastern big-eared bat is suspected to use Back Bay NWR habitats, however no sightings have occurred.

The mammal group includes nuisance species in addition to native wildlife species. Feral hogs, feral horses and the nutria are non-native species that have become residents of the Back Bay ecosystem. It is suspected that the feral hogs and horses are former domestic livestock that were allowed to roam free, or escaped, from the old, abandoned Village/Town of Wash Woods to our south (in what is now False Cape State Park, VA), and/or from Carova, North Carolina. The nutria has expanded its range into Virginia and Back Bay; although the existing population does not appear to pose as serious a threat to Refuge habitats, as it does in more northern states. Few muskrats are present. Some local residents feel that the nutria has displaced the native muskrat from its usual habitats in Back Bay. River otters are periodically observed within Refuge impoundments and Back Bay during most of the year.

Bobcats have been observed in the Black Gut woodlands, north of Sandbridge Road. One was struck by a vehicle and killed in 1994 on Sandbridge Road, and retrieved by Refuge staff.

Reptiles

The Refuge is home to a variety of reptiles, primarily snakes and turtles. Reptiles that are found on the Refuge include the rainbow, northern black racer, black rat, northern water, brown water, cottonmouth, smooth green, eastern kingsnake, eastern hognose, eastern garter, and ribbon snakes, which are common year-round residents here. The rare eastern glass lizard has been observed crossing the entrance road near the Refuge beach gate. Other common reptiles include the fence lizard and several skinks. The southern copperhead exists in the northern and western portions of the Back Bay watershed, including the Pungo and Charity Neck areas; and may also exist on the Refuge in suitable lowland habitats. The most numerous reptiles are the cottonmouth, black rat, northern water, brown water and hognose snakes.

Common terrestrial turtles include the eastern box, snapping, yellow-bellied, red-bellied, eastern painted, stinkpot, eastern box and eastern mud turtles. The yellow-bellied and snapping turtles are the most numerous species. The spotted turtle is suspected to be present in interior Refuge wetlands, although it has not yet been seen by Refuge staff. The Atlantic loggerhead sea turtle nests on Refuge and False Cape State Park beaches during its June through August nesting season.

A number of amphibians can also be found on the Refuge. This group of frogs, toads and salamanders includes such common Refuge residents as the southern leopard, the green, pickerel and bull frogs; the spring peeper, green and squirrel tree frogs; the eastern narrow-mouthed, southern and Fowler's toads. Information on salamanders is lacking; however, the red-backed salamander and two-toed amphiuma are known to exist on the Refuge. An amphiuma was accidently unearthed from muck next to a sign post during a Refuge maintenance project along the False Cape State Park border in the mid-1990s.

Three anuran frog and toad surveys were carried out during the spring and summer of 2001to 2003. Survey data reveal that the Refuge supports high numbers of the following frogs: the spring peeper, green tree, southern leopard, Brimley's chorus, green, and squirrel tree frogs; together with lesser numbers of the bull and carpenter frogs, and the narrow-mouthed, southern and Fowler's

toads. These surveys are part of a regional effort to monitor amphibian population trends on Region 5 National Wildlife Refuges, through use of a regional anuran survey protocol.

Fish

The impoundment complex supports a diverse and healthy fish community. The following species are most numerous in this 900 acre complex: largemouth bass, chain pickerel, bluegill/brim, redear sunfish, white and yellow perch, black crappie, brown bullhead, pumpkinseed, chub sucker, carp, American eel, bowfin, and a variety of bait fish.

The open waters of Back Bay and its tributaries support higher populations of carp, American eel, bowfin, flounder, brown bullhead, blue-spotted sunfish, white perch, warmouth, Atlantic needlefish, silversides, and longnose gar, than do the impoundments. Some largemouth bass, bluegill, pumpkinseed and pickerel also exist in the bay complex; but, in much lower levels than 25–30 years ago when SAV was more prevalent.

Efforts are made (during spring and early summer) to exclude spawning carp, longnose gar and bowfin, from entering the impoundments when exterior water control structures are open, through use of wire fencing sections placed over the pipe mouths on the bay side.

Invertebrates

Two state rare beetles (*Cicindela lepida* and *C. trifasciata*) and two rare moths (*Heterocampus astarte* and *Metria amella*) have been located on Refuge habitats. Both moths are associated with live oak trees. A third rare, live oak-associated moth (*Panopoda repanda*) is suspected to exist in this same vicinity, and has been seen in nearby False Cape State Park. The rare stripe-winged baskettail (*Epitheca costalis*) was observed in the Black Gut vicinity during a 1992 DCR-DNH Inventory (Clampitt, et al.1993) for the City of Virginia Beach.

Appendices C and D of "A Natural Heritage Inventory of the Back Bay National Wildlife Refuge" (Walton et al. 2001), provide listings of rare species created from observations and collections made at Back Bay NWR by DCR-DNH in 2000. However, none of these species has an official federal or state status.

The primary food of fish, shorebirds, some waterfowl (especially young), and amphibians are invertebrates. These include a variety of invertebrates that occupy the benthic soils below the water column, those that reside within the water column, as well as those in the air above the water and soil. Water column invertebrates include adult and larval insects (including *Diptera*, and *Hemiptera*), and crustaceans such as the scud (*Amphipoda*), isopod (*Isopoda*), copepod (*Copepoda*), and shrimp (*Mysidaceae*). Benthic invertebrates include: worms (*Oligochaeta*), clams (*Bivalvia*), snails (*Gastropoda*), some insect larvae (*Chironomidae* spp.), and small crabs (*Malacostraca-Decapoda*). All of these invertebrates are critical components in the food web of our wetlands areas, and merit consideration when planning land use changes.

Threatened or Endangered Species

Although no longer listed under the Endangered Species Act (but still protected under the Bald Eagle and Golden Eagle Protection Act and the Migratory Bird Treaty Act), the State threatened bald eagle uses the Refuge. The 1993 North Bay Marshes bald eagle nest was the first successful Back Bay eagle nest in recent history. Increasing numbers of juvenile eagles have been observed in tree-lines along the Back Bay shoreline during 2001 to 2003. Several new nests at Mackay Island NWR and on the North Landing River could be progeny of this first eagle nest.

During the past 15 years, the federally threatened Atlantic loggerhead sea turtle has deposited as many as nine nests each summer on Refuge and False Cape State Park beaches. In addition, occasional strandings of the Atlantic loggerhead, the federally endangered Kemp's ridley, green, leatherback and hawksbill sea turtles occur from May through September. Sea turtle stranding data is collected and passed on to the Virginia Aquarium's Stranding Center which maintains the local sea turtle and marine mammal stranding database.

The federally threatened shortnose sturgeon has been reported in Back Bay, but not confirmed. A specimen was reported in Refuge salvage records as collected in 1990, but a freezer breakdown resulted in its loss.

The federally threatened piping plover uses Refuge beaches during its spring and fall migrations, but to date has not nested here. The North Mile of the Refuge is closed to the public to allow this shorebird and others to use that section of beach undisturbed.

The federally threatened northeastern beach tiger beetle is not known to exist on Back Bay NWR; however, two other rare tiger beetles were discovered during a 2000 rare species inventory.

The State endangered eastern big-eared bat is suspected to use Back Bay NWR, but its occurrence has not been confirmed. The State threatened glass lizard was documented on Back Bay NWR during the late 1990s. Surveys were conducted during 2006 to document the extent of its presence on the Refuge; however, no specimens were located. One sighting occurred immediately southeast of the Refuge Headquarters, at the pipe gate, on February 25, 2007.

Wildlife and Animal Damage Control

Several Refuge wildlife species are considered non-native or feral in nature. The presence of such species often merits a problem or pest species status, particularly if the species presents a conflict with habitat management objectives or goals. Currently the following species fall into this pest species status: the feral horse, feral pig/hog, nutria and resident Canada goose.

The feral horse and feral hog are probably escapes/releases from human residents of the former town of Wash Woods that once existed in what is now False Cape State Park. The nutria has probably spread southward from states further north, where it was first introduced during the early 20th century. The Refuge year-round resident Canada goose population has gradually built up during the past 15 years, from 5-10 to about 35.

The feral hog, feral horse, nutria and resident Canada goose all consume moist soil vegetation being grown each year in the impoundment complex to feed wintering and migrating waterfowl. If too much browsing on this important resource is allowed to occur, the ability of the Refuge to provide wintering waterfowl foods will be severely reduced. Feral hogs also severely impact dike slopes and public use areas with their rooting behavior as they seek tubers and other foods below the surface of the ground. Such turned-over ground contributes to soil erosion around dike slopes, and creates a public safety hazard, while also removing the food-plants/vegetative cover. In addition, the Refuge has partnered with Virginia Department of Game and Inland Fisheries in a research study to better understand Refuge pig population dynamics and population size. The Study began in 2005, and is ongoing (2007). VDGIF has expended a great deal of time, funding and manpower to consistently and professionally collect and analyze the resulting data. Feral hogs feed on insect larvae, amphibian and reptiles as well, reducing population numbers and possibly affecting species diversity.

Such habitat management conflicts require remedial action to reduce the impacts. Often a culling of the population is necessary. In the case of feral hogs, the Refuge operates a one week hunt during which the public is allowed to hunt and remove these animals from the impoundment complex. This helps reduce the negative impacts until the population builds up once again.

The feral horse problem is being remediated by a cooperative effort between the residents of Sandbridge, VA, FCSP staff, and the Virginia Wild Horse Rescue, VA. A fence has been built at the North Carolina border in an attempt to keep the horses in North Carolina. If horses are found in the Park, Refuge or Sandbridge, the Virginia Wild Horse Rescue is contacted to remove the horses.

The resident Canada goose population increase is currently being handled by Refuge staff who are attempting to control nesting success in the impoundment complex from March through June. Nests are first visually located and subsequently visited. During the visit, the eggs are shaken and/or sprayed with cooking oil to keep them from hatching out. This program has had limited success due to the difficult nature of finding the hidden Canada goose nests. The Refuge applied for and received a FWS permit to remove adult resident Canada geese during the nesting season in the Refuge impoundment vicinity during 2005. Several geese were removed in 2006. This egg addling and adult removal control effort will continue until the Canada goose ceases nesting in the impoundment vicinities.

The nutria has not been as significant a problem here that it has been further north in Maryland and Delaware. We suspect that the water management regime in the impoundment complex (drawing down in the spring and summer, and flooding during the fall and winter) prevents their numbers from building up. We think that their populations are forced to disperse into Back Bay during the draw-down periods, where they are more prone to predation and less hospitable conditions that result in mortality. Impoundment habitats have not experienced noticeable nutria eat-outs to date. It is possible that if the impoundment complex was flooded year-round, that nutria eat-outs would occur, and impoundment habitats would be negatively impacted. No control efforts to date are necessary for the nutria.

Insects and Diseases

The following pest insects and wildlife diseases have occurred in this vicinity, or are near enough to be concerned about it spreading into our geographic area, since the end of the twentieth century. Guidance on how to deal with all possible wildlife diseases (well-known waterfowl diseases, Highly Pathogenic Avian Influenza, West Nile Virus, Eastern Equine Encephalitis and Chronic Wasting Disease) is now provided in one Refuge "Integrated Disease Plan," that was completed in early 2007.

Southern Pine Bark Beetle— This pest focuses principally on loblolly and shortleaf pines; although very little shortleaf pine exists in the Back Bay vicinity. Although this is probably the principal beetle pest in this area, other bark beetles also exist and may inhabit the same tree, and thereby combine to kill the host pine tree (Thatcher and Connor 1985). Control on the Refuge consists of cutting and removing the infested trees and a buffer of uninfested trees, and letting the cut trees lie ("cut and leave"). This technique is recommended by Swain and Remion (1981) in their booklet, "Direct Control Methods for the Southern Pine Beetle." The beetle larvae seem to require upright, live trees to mature in; since they die when the trees are cut and left in a horizontal position. Two "spotty" outbreaks occurred during the past fifteen years in the Sandbridge Road vicinity during the 1990s; however nothing more recent has occurred.

Gypsy Moth — This insect pest has the potential to defoliate live oak, other oaks and deciduous trees. Current policy consists of cooperating with the U.S. Department of Agriculture in monitoring and controlling an existing population in False Cape State Park, in the North Carolina border vicinity. Where no human impacts are involved, Refuge policy is to allow their populations to peak and crash naturally. When their populations reach the peak level, they are known to be infected with a virus that virtually wipes them out without human control efforts necessary. This has been shown to be an effective management policy. No known concentrations currently occur on the Refuge.

Eastern Tent Caterpillar — These caterpillars are regular users of the Refuge whose populations peak and crash on their own, without control efforts required. Natural predators and other natural mortality factors successfully control their numbers. They occasionally defoliate black cherry and other deciduous trees, but rarely cause mortality to infested trees.

Mosquitos — West Nile Virus (WNV) & Eastern Equine Encephalitis (EEE) can occur in people and horses. WNV often first appears in birds. The common and fish crows, blue jay and several hawks, serve as the principal sentinel species that appear to register outbreaks first. A number of mosquito species (six *Culex* spp., including the common house mosquito *[Culex pipiens]*, as well as *Aedes albopictus, Ae. vexans* and *Ochlerotatus triserius*) are the principal vectors for WNV. The *Culiseta melanura* mosquito is the only known vector in this area for EEE.

During 2004 to the present (2007) Refuge biological staff worked closely with City of Virginia Beach Mosquito Control biologists during monitoring of Refuge mosquito populations for WNV outbreaks. To date no cases of either WNV (in birds or humans) or EEE are known to have occurred on the Refuge or in the Refuge vicinity. As a result, no mosquito control work has been necessary in Refuge habitats.

Other biting flies — Principally dipterans (*Tabanidae* family) are a nuisance, but necessary since as both adults and larvae, they serve as critical invertebrate foods to numerous migratory bird and insect species. Because they are a critical component in the Back Bay ecosystem and food-chain, Refuge populations are not currently controlled.

Avian cholera — This avian disease occasionally surfaces in wintering diving duck populations using the Atlantic Ocean and Chesapeake Bay. It last occurred during the winter of 1992-1993. Species impacted were scoters, oldsquaw and some gulls. Management consists of removing dead birds along shorelines to reduce the contagious nature of the disease, and disposing of the carcasses at the local City Animal Control facility's incinerator.

Chronic Wasting Disease — During 2005 – 2006 this Cervid disease recently spread into deer populations in New York and West Virginia. It threatens to spread into western Virginia. However, to date, CWD has not yet occurred in Virginia.

Non-native Organisms

During 2002 and 2003, Region 5 refuges embarked on an invasive species mapping effort aimed at identifying and quantifying the acreages of pest invasive species. Back Bay NWR joined that effort during 2003, when it received Regional funding enabling it to hire field support by qualified technicians with Trimble GPS units. Regional protocols were obtained, together with a listing of invasive plant species. Of that listing, 13 plant species were identified as currently existing on Back Bay NWR. The top three priority species are common reed, Japanese

stiltgrass/eulalia and Johnson grass. These three non-native invasive species were mapped, and control work consisting of the application of herbicide would continue until their presence is greatly reduced or eliminated.

Other non-native species listed include: Japanese honeysuckle, morning glory, Asiatic dayflower, giant foxtail, Asiatic sand sedge, Eurasian water-milfoil, parrot-feather, fennel, shrubby bush-clover/lespedeza, weeping lovegrass and yellow iris/flag. Although these species are present on Back Bay NWR, they do not pose a significant threat, because they provide benifits to resident wildlife, and do not appear to significantly compete with other resident species for the ecological niches they share, or occupy, in their respective habitats. However, their locations will be eventually mapped and their populations tracked when possible.

Dr. Kristin Saltonstall, of the University of Maryland Center for Environmental Science's Horn Point Lab, and her associate Robert Meadows of the Delaware Division of Fish and Wildlife, have discovered several native strains of Phragmites in North America that are not as invasive as the more common non-native species. These experts have recommended that the native Phragmites populations be left intact. Back Bay NWR biologists are capable of identifying both the native and invasive strains. Several populations of the native Phragmites strain were discovered on the Mackay Island NWR, Knotts Island by Back Bay NWR Biologist John Gallegos in 2004. Samples were collected and subsequently confirmed by Dr. Saltonstall. Mr. Meadows subsequently visited this area with Biologist Gallegos and mapped the native Phragmites sites on Knotts Island. He also participated in a boat survey of most of Back Bay, including part of the North Bay Marshes, in search of the native strain. We suspect that because of the native strain's preference for quieter, oligohaline waters, some exists on Back Bay NWR—especially in the Long Island, Bay island complex, North Bay Marshes and Black Gut vicinities—as well as False Cape State Park. However, that boat survey failed to reveal any sign of the native strain.

Socio-Economic Factors

Setting

Virginia Beach City is in the southeastern corner of Virginia with the Atlantic Ocean to the east, Currituck County, North Carolina to the south, the cities of Chesapeake and Norfolk, Virginia to the west, and the Chesapeake Bay to the north. Land use patterns divide the City into three sections. The northern section is the higher density urban and residential region. The southern section is the rural region. The mid section or "Princess Anne Transitional Area" provides a mixed density transition between the urban north and rural south. The boundary between the urban north and Transition Area is known as the Green Line. Back Bay partially bisects the City from the south in an east-west direction, with North Landing River and Back Bay's bay complex being the primary water areas.

Back Bay NWR is located in the eastern half of the rural southern section of Virginia Beach. The Refuge is bounded to the east by the Atlantic Ocean, to the south by False Cape State Park and Back Bay, to the west by rural land, to the northwest by the mixed density Transitional Area, to the north by Lake Tecumseh and to the northeast by the Sandbridge residential resort community.

Virginia Beach has been one of the fastest growing cities in the U.S. for several decades. However, developable land in the urban north has dwindled, thus putting pressure for new growth south of the Green Line. Significant land use changes adjacent to Back Bay NWR could occur with further development in the Transitional Area and incursion of residential development into the rural southern region.

These potential land use changes form a significant part of the Virginia Beach 2003 Comprehensive Plan and provide a decision making crossroads for the City with respect to the type, location, and amount of growth. The Plan acts as a guide rather than a land use law. The Comprehensive Plan calls for retaining the rural character of the southern region while allowing moderate growth in the Transitional Area. Back Bay NWR and the rural nature of the southern area are compatible uses and are planned as such.

Population

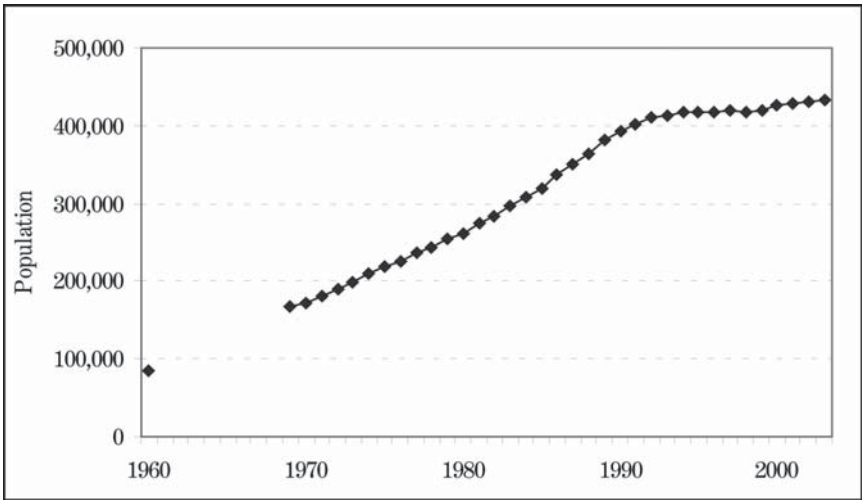
The population of Virginia is about 7.1 million. Approximately one fifth of the State, or 1.5 million, live in the Norfolk-Newport News-Virginia Beach ("Tidewater" or "Hampton Roads") Metropolitan Statistical Area located in the south-eastern corner of the State. The metropolitan area consists of the cities of Virginia Beach, Chesapeake, Portsmouth, Newport News, Norfolk, and Hampton, with Virginia Beach the largest city with 425,257 (U.S. Department of Commerce 2000).

Much of the growth is attributed to the military presence as well as being a resort community. Table 3.4 indicates this tremendous amount of growth. (In 1963 the County of Princess Ann and Virginia Beach merged to form the City of Virginia Beach) The growth rate since 1990 has begun to slow as the amount of developable vacant land in the northern urban-suburban area declined (City of Virginia Beach 2003), as well as a decline in the birth rate (Hampton Roads Planning District Commission 2002). A comparison of the 1960–2003 population data (Figure 3.19) with the 1959–2003 data on farmland acreage (Figure 3.20) indicates the stark contrasting pattern of increasing population and decreasing farm land-use in the City.

Table 3.4. Virginia Beach population trends

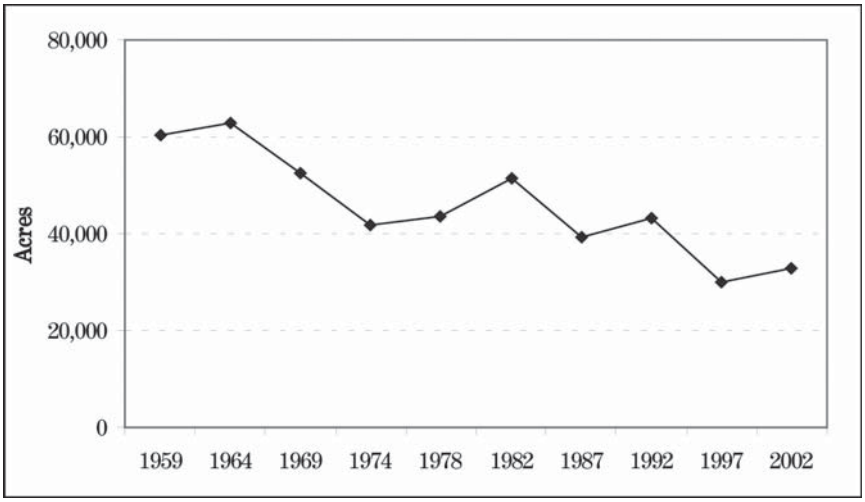
Year	Population	Population Growth	Growth Rate
1940	19,984	-------	-------
1950	42,277	22,243	111%
1960	84,215	41,988	99%
1970	172,106	87,891	104%
1980	262,199	90,093	52%
1990	393,069	130,870	50%
2000	425,257	32,188	8%
2003	433,000	7,743	10%

Figure 3.19. Virginia Beach population trends, 1960-2003



(Sources: U.S. Department of Commerce, Census Bureau; Virginia Beach Facts and Figure, 2003)

Figure 3.20. Farm Acreage within Virginia Beach between 1959-2002



(Sources: U.S. Agricultural Census; Virginia Beach Magazine, Winter 2003-2004)

The population is 71.4 % White, 19.0 % is Black, 4.9 % is Asian, 4.2 % is Hispanic, and 0.4 % is Native American (U.S. Department of Commerce 2000). Adjoining cities in the metropolitan area have a significantly higher percent African-American population.

The 2000 census population age distribution is unusual in that the median age, 32.7, is fairly young. Slightly more than one third of the population is under the age of 25, nearly one half is between the age of 25 to 54, while only 16% is over the age of 55.

While one half of the 2000 census population had lived in the same dwelling for the previous five years, there is a segment of the population which can be considered mobile or recently immigrated. One fifth of the 2000 census residents had lived in another state in 1995. Part of this may be due to the relocation to Oceana Naval Air Station of military personnel after the closing of the Cecil Field, Florida, Naval Air Station in 1999.

Employment

For several decades military installations have provided the predominate employment base in Virginia Beach (Table 3.5). The four military bases have an approximate annual payroll of $1.1 billion for 35,000 armed services and civilian workers (U.S. Department of Commerce 2003). Since 1970 total armed service employment has remain moderately stable at about 25,000, with a peak of 29,000 from 1989-1991 (Hampton Roads Planning District Commission 2002). However, due to the enormous growth of the total employment base of Virginia Beach, military percent of total employment has declined from 40% in 1970 to 10% in 2000. Local government and education provide the next highest categories of employment in Virginia Beach.

Table 3.5. Virginia Beach Military Employment

Installation	Active Duty	Civilian	Total	Payroll (million)
Oceana	13,000	2,100	15,100	$600
Little Creek	7,700	5,200	12,900	$232
Fort Story	1,500		1,500	$70
Dam Neck	5,000		5,000	$224

Oceana Naval Air Station is the Navy's largest Master Jet Base and is home to most of the F/A-18, Hornet Squadrons on the East Coast. Little Creek Naval Amphibious is the largest of its kind in the world and is the major operating base for the amphibious forces of the U.S. Atlantic Fleet. Fort Story is the Army's Logistics-Over-The-Shore training and test site. Dam Neck Fleet Combat Training Center provides operation and employment of combat direction and control systems.

There are a number of other major employers. Table 3.6 lists employers with at least 1000 employees (U.S. Department of Commerce 2003; Hampton Roads Economic Development Alliance, 2004)

Table 3.6. Virginia Beach Employment

Employer	Industry	Employees
Virginia Beach Schools	Education	9,600
Virginia Beach City	Government	5,000
AMSEC LLC	Naval Engineering	2,300
Manpower	Human Resources	1,800
Lillian Vernon	National Catalog Distribution Center	1,700
GEICO	Automobile Insurance	1,600
Gold Key Resorts	Resort	1,600
Stihl	Outdoor Power Equipment	1,300
Amerigroup	HMO Provider	1,150

Tourism provides another major, but seasonal, component of employment. This water oriented industry is one of the largest in the country with 28 miles of public beaches. The resort industry contributes $700 million to the local economy on an annual basis with 3 million visitors (U.S. Department of Commerce 2003).

Income

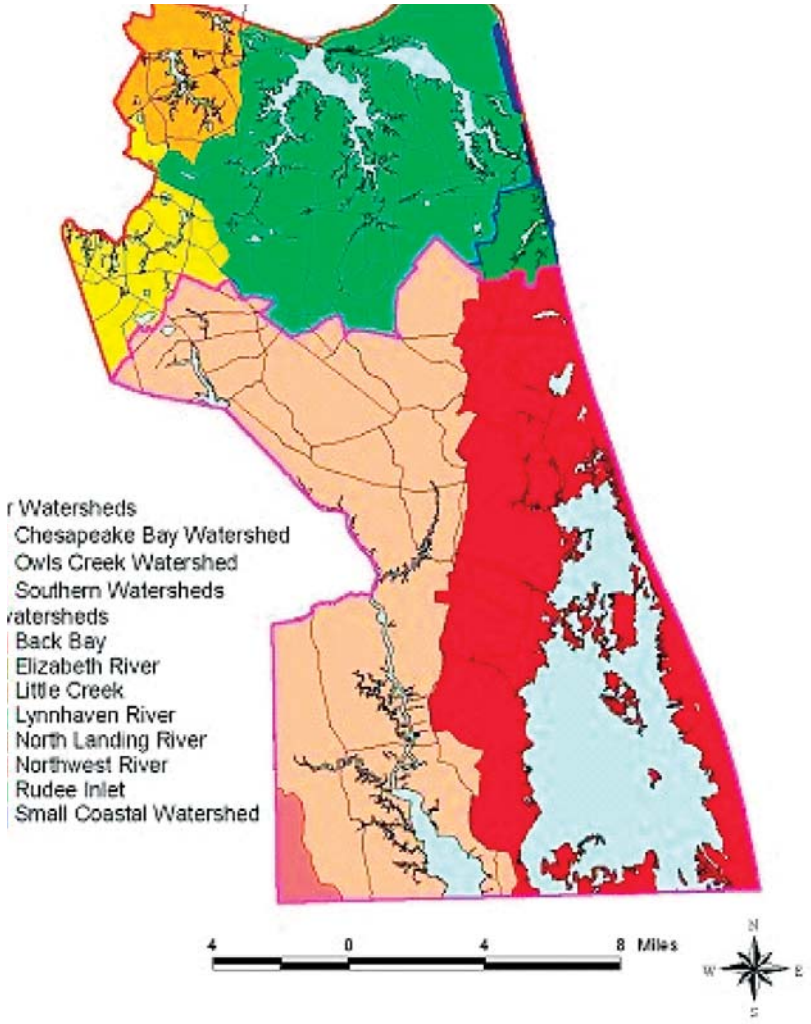
In 2004 the median family income was $53,540. This ranked Virginia Beach as the fourth highest in the nation, (U.S. Department of Commerce 2004). Cost of living is relatively low, slightly below the national average, thus causing high purchasing power for the area.

The 2000 poverty rate was 6.5 % of the population, well below the state average of 9.6 % (U.S. Department of Commerce 2000). The unemployment rate in January, 2004 was 3.5 %, slightly below the Commonwealth of Virginia unemployment rate of 3.9 %, and well below the national rate of 5.8 % (Virginia Employment Commission 2004).

Land Use

Virginia Beach is a level to gently rolling, near sea level, urban community bordering the Atlantic Ocean. Of its 259 square miles twenty percent, 51 square miles, is water. Maximum inland non-beach dune elevation is 25 feet. Back Bay NWR, 14 square miles or 9,035 acres, is located in the southeastern corner of Virginia Beach within the Back Bay watershed. The interior of the watershed is water. Around the periphery of water are lowland wetlands, much of it protected by various public entities. The outermost uplands of the watershed are developed residential, farmland, and barrier sand dunes (Figure 3.21).

Figure 3.21. Virginia Beach Watersheds (Source: City of Virginia Beach 1999)



The 2003 Virginia Beach Comprehensive Plan describes existing land uses and proposed changes in the future as a guide to growth. The urban-suburban northern area has dwindling acreage for development. From 1997 to 2003 the number of acres declined from 13,000 to 5,000. The challenge for the City is how and where to channel new growth. One alternative would be to redevelop existing developed land in the northern area.

Another land use alternative would be to develop extensive vacant land in the southern area below the Green Line. Three locations adjacent or within Back Bay NWR were singled out for consideration in the Plan and have land uses which impact Back Bay: Sandbridge, Princess Anne Transitional Area, and Rural areas.

Sandbridge borders northeastern Back Bay. It is an elongated, narrow barrier island between the Atlantic Ocean and Back Bay. Sandbridge is a low density,

single family and mid-rise condominium apartment summer resort community of about 1200 dwelling units with a neighborhood commercial center. The plan calls for retaining the existing, low density character of Sandbridge and for land uses compatible with the environmental objectives of Back Bay NWR.

The area which could have the greatest proposed land use change adjacent to Back Bay NWR is the Transition Area northwest of the Refuge. The northern boundary of the Transition Area was designated in 1979 as the Green Line in the City's first Comprehensive Plan. The original intent of this administrative line was to divide the city into the urban north and rural south. The later creation of the Transition Area now divides the City into three zones of density. The Transition Area (renamed as the Princess Anne area) was formerly the Princess Anne County government seat before it merged with Virginia Beach in 1963.

The Transition Area is considered to be mixed use, mixed density. One of the primary objectives of the Comprehensive Plan is to keep this area as a transition between the urban northern and rural southern parts of the City. To this end half of the land is planned as an integrated greenway system with preservation of natural resources, open space and recreation. Development potential is purposely kept low. However, due to the fact that developable land still exists, significant growth can occur. Such growth would include low to mid-rise offices and corporate parks, light industry, and limited retail. Another proposal is for the creation of the Southeastern Parkway to traverse the area in a northeast to southwest direction.

The area south of the Transition Area is designated as the Rural Area. Back Bay NWR is located in the easterly portion. The Rural area lies south of Indian River Road from North Landing Road and extends to the North Carolina border. It covers 138 square miles, close to half of the total area of the City. The primary land use of this area is agriculture, wetlands, water, and isolated residential. Back Bay and North Landing River bisect a narrow three by twelve mile, north by south, swath of low-lying upland.

Lack of city services, such as sewer and water, and poorly drained soils limit the development potential of this area. The Comprehensive Plan calls for very limited growth in this area. Residential densities would be kept very low (5-15 acres per dwelling unit) with preservation of agriculture and wetlands. Throughout the 1980's and 1990's the average residential annual growth was about 30 dwellings per year. Of primary importance to Back Bay NWR is whether or not developmental pressures in the Rural Area are significant enough to counteract the intent of the City's Comprehensive Plan.

Back Bay NWR does not exist in isolation with respect to protected open space. Regionally, the largest nearby refuge is the 110,000 acre Great Dismal Swamp NWR that straddles the Virginia – North Carolina border 25 miles southwest and west of Back Bay, Virginia Beach. Just south of Back Bay NWR is Mackay Island NWR. This Refuge also straddles the Virginia – North Carolina border, with about 1,000 of its 9,035 acres located within Virginia Beach. The Nature Conservancy manages the North Landing River Preserve. The Preserve is one of the largest expanses of undisturbed freshwater marsh habitat along the entire eastern seaboard. Approximately 2,700 of its 7,500 are within Virginia Beach, with the remaining acreage located west in the city of Chesapeake.

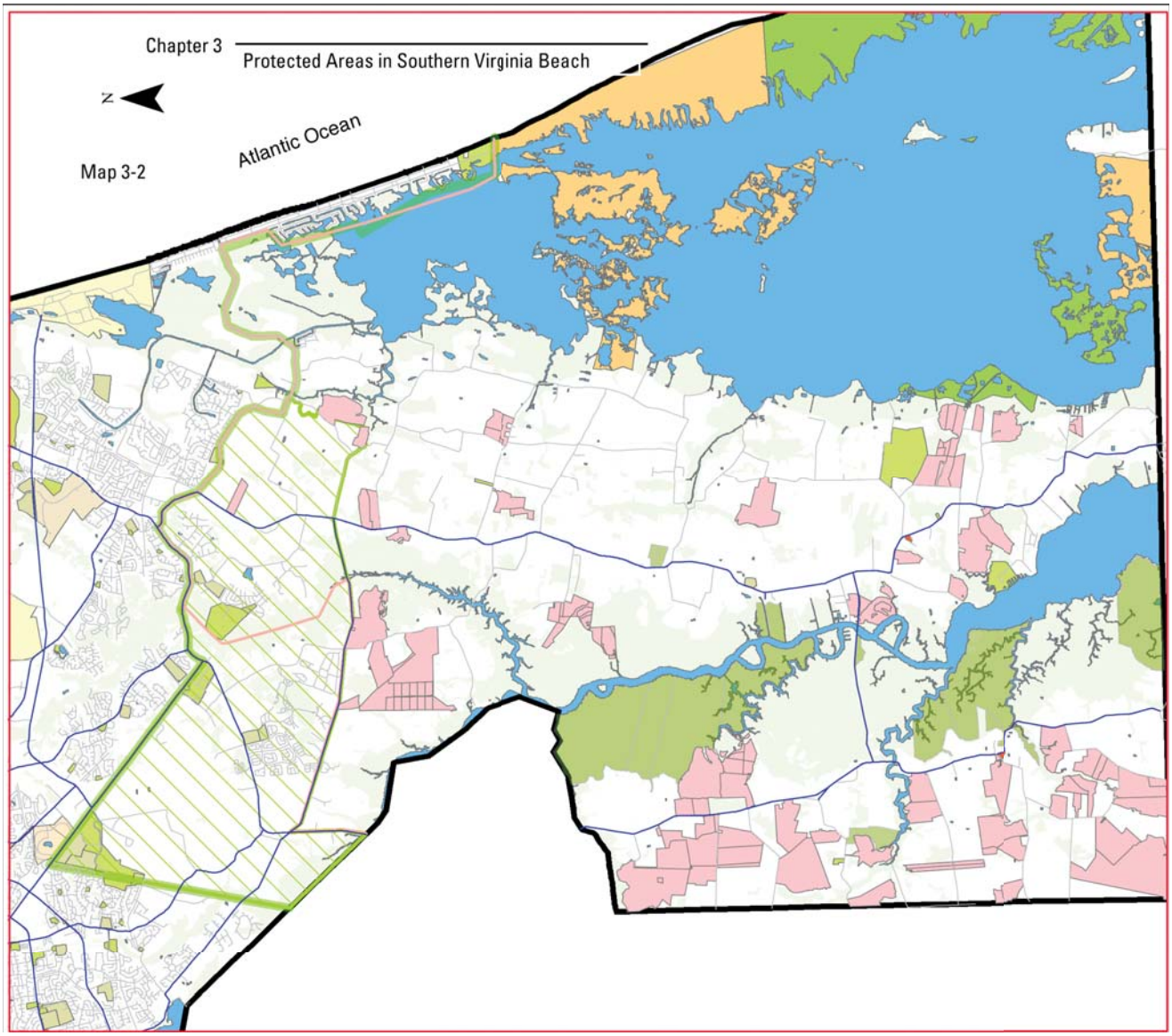
Within Virginia Beach there are adjoining open space areas owned or managed by various entities. Table 3.7 lists estimates of major acreage. The map below indicates the location of major open protected areas in southern Virginia Beach (Map 3-2). The map underestimates the extent of Back Bay NWR. The most striking aspect is that about two thirds of southern Virginia Beach is water or protected open space.

The Virginia Beach Agricultural Reserve Program (ARP) was established in 1995. It includes lands already actively being farmed, but through transfer of development rights will remain open space; rather than potentially being developed. Final ARP increases in acreage would total 20,000 acres of the current 30,000 acres being farmed. By early 2004 the total ARP acreage was 6,775. Approximately 500-1,000 acres are being added per year to the ARP.

Table 3.7. Virginia Beach Open Space – approximate acreage (w/ adjoining regions)

Sites	Acres
Open Water	33,000-48,700
Agriculture	30,000
Virginia Beach Agric. Reserve	6,775
Back Bay NWR	9,035
Mackay Island NWR (NC/VA)	[8,000]
False Cape State Park	4,320
The Nature Conservancy – N. Landing R.(VB/CH)	[7,500]
Princess Anne Wildlife Mgt. Areas	1,500
Little Island Park	150

Map 3-2. Protected Areas in Southern Virginia Beach



Archaeological and Historical Resources

The only large scale archaeological survey done on the Refuge, by R.C. Goodwin & Associates, identified 24 archaeological sites. The majority of information in the following narrative is derived from the text of that report (Goodwin 1989). Five additional sites have been found since 1989. Many sites on the Refuge contain material from more than one time period, revealing repeated use over several centuries. Of the 29 total sites, 10 have Native American material dating from prior to European contact, 14 have material associated with historic period farms on various islands as well as on the western shore of the bay, and 9 have material associated with historic hunting clubs.

Pre-Contact Sites

Human occupation in Virginia appears to have begun in what archaeologists call the Paleo-Indian period (ca. 14,000 to 9,000 years ago). However, the oldest sites identified on the Refuge date to the Early Woodland period (ca. 3,000 to 2,500 years ago), and sites dating prior to that appear to be rare in the Refuge vicinity. Several causes have been posited for this lack of evidence for earlier sites. Sea level rise and erosion were fairly rapid during the preceding Archaic periods (ca. 9,000 to 3,000 years ago), hindering development of shellfish beds until near the end of that period. However, following sea level stabilization in the Early Woodland, shellfish became a substantial component of the bay's aquatic environment, and the majority of pre-Contact sites on the Refuge contain shellfish remains. Some researchers have posited a locally low human population in the Archaic, feeling that absence of shellfish may have made the area unattractive for settlement. Submergence of sites under saltmarsh in areas of relatively quiet water, and erosion of those in more exposed areas during Archaic sea level changes may also have destroyed Archaic and Paleo-Indian sites or hidden them from our view.

Following centuries of relative stability, sea level rise has once again accelerated remarkably in recent decades. As during the earlier marine transgression, sea level rise may have submerged relatively intact sites in sheltered settings beneath several feet of tidal marsh, but such sites are extremely difficult to find except through accidental discovery. In areas exposed to storm surges or persistent wind driven waves, erosion has probably destroyed sites. Such areas are common on the islands and shores of the bay as well as along the entire seafront of the barrier beach. Every one of the identified pre-Contact sites and the vast majority of Historic Period sites in the Refuge were identified by Goodwin as experiencing substantial damage or loss from erosion. Some sites reported by Goodwin's researchers may have completely washed away in the nearly 20 years since that study. Finally, lack of sites predating the Woodland period may partly reflect the fact that there have been relatively few archeological surveys in the Refuge and its immediate area when compared to other parts of the state.

Sites on the Refuge dating from the Early Woodland (ca. 3,000 to 2,500 years ago) and Late Woodland (ca. 1,000 to 400 years ago) are most easily differentiated by distinctive pottery types relating to each time period, but appear to share a reliance on shellfish as a major part of the Native American diet. No Middle Woodland sites (ca. 2,500 to 1,000 years ago) have been found in the Refuge, but several sites show signs of both Early and Late Woodland occupation. The absence of identified Middle Woodland artifacts at those sites is probably due to the very limited archaeological research on them, rather than due to the sites being actually abandoned during the Middle Woodland.

As noted above, some of the sites reported by Goodwin in 1989 have probably been lost to erosion, but others probably still have significant research potential, due to good preservation of shellfish, finfish, and other materials that could provide substantial data on how Native Americans lived on the land and harvested its resources over the course of several thousand years. Goodwin

reported that some of these sites are known to artifact collectors, but the extent of looting damage to them is unclear.

At the time of Goodwin's study, no refuge lands had been acquired on the western shore of the bay. Prehistoric sites are likely in many areas there, both within the current Refuge and within its acquisition boundary. Several small surveys have been performed by Service archaeological staff for wetland restoration projects in former croplands on that part of the Refuge. One pre-Contact site, of uncertain date, was identified in such a study and was subsequently preserved by redesign of the project to avoid it.

Historic Sites

A patent was issued for a portion of two bay islands in 1675, but no additional island patents are recorded until the early 18th century. Goodwin's discovery of early 18th century pottery at a site on one island that also contains pre-Contact material may indicate either Euro-American settlement on the earlier site, or a continuation of occupation by Native Americans. The name "Trading Post" given to an 18th century patent on one of the other islands may reflect their continued presence.

Reference to a house and other farm structures in a 1711 title record demonstrates that Euro-American settlement was established on at least one of the other islands before 1711, and farms were established on other islands around that same time. Most of the island farms appear to have operated until the final decade of the 19th century. Along with dwellings, outbuildings, livestock enclosures, pastures, and orchards, these farms included a network of bridges, canals, and landings necessitated by their unusual setting. A family cemetery was established on at least one island prior to 1868. Little research has been done on these rather unusual farmstead sites. A program of historical and archaeological study could yield insight into their economic base as well as social status of their occupants, some of whom were landowners and some tenants. As with pre-contact sites on the bay, erosion is taking a severe toll on these sites.

In the last decade of the 19th century, most of the bay islands and barrier beach became property of three large waterfowl hunting clubs. Two large clubhouses formerly stood within the Refuge, one on an island and the other at the approximate location of the current Refuge office. Early 20th century maps show a system of gated channels and guard shacks constructed by the clubs to deter poaching, but those appear to have left little or no archaeological evidence. A donated collection of waterfowl hunting equipment, partly on display at the Refuge, testifies to waterfowl hunting on the bay.

Maritime archaeological resources may be fairly substantial on the Refuge and immediately offshore, as numerous shipwrecks are recorded having grounded on the barrier beach. Actual discovery of abandoned and wrecked vessels is usually subject to vagaries of weather, and only a few have been reported to Refuge staff and studied by maritime archaeologists. Study of the design of one vessel wreck established that it was a two masted schooner built in the early 19th century, formerly a commonplace type of vessel, but a type that is seldom available for study today in maritime museums.

As noted earlier, the Goodwin study did not cover lands within the acquisition boundary or currently in the Refuge on the western side of the bay. No published archaeological or historical overview exists for that part of the Refuge. Poor drainage hindered settlement of the west shore of the bay nearly as much as on the islands, and no patents are recorded until the last quarter of the 17th century. Settlement consisted mostly of small farms from the time of initial settlement until

the onset of 20th century suburbanization. Five farmsteads dating from the early 19th to the early 20th century, as well as a small family graveyard, were identified as a result of minor archaeological and historical studies by Service staff.

Historic Structures

While no standing structures of the 17th or 18th century remain within the acquisition boundary, the area does reveal a scattering of 19th and early 20th century farm buildings interspersed with modern residential development. There are currently no above-ground historic resources on the Refuge itself. Historic structures eligible for inclusion in the National Register of Historic Places may exist within the acquisition boundary and could be inadvertently acquired by the Refuge along with surrounding farmland.

A small farmhouse was acquired in exactly that manner by the Refuge in the early 1990s. As it was in extremely deteriorated and vandalized when it was acquired, demolition was proposed. Much of the vandalism appears to have been related to a belief that it was the home of Grace Sherwood, notable for her trial under accusation of witchcraft in 1706. However, research firmly established that the house was actually built around 1822 and was probably not even on any property that had been part of Grace's farm.

Consultation with the Virginia Department of Historic Resources (DHR) did confirm that the house was an historic structure of unusual design for its time and place. DHR and Service staff performed an initial study of the house, involving photographs, sketch plans, and historic research. That study revealed its antebellum owners as "middling planters" and slave-owners with unusually extravagant taste in clothing, carriages, and architectural decoration. Plans for stabilization and historic interpretation of the structure were then explored. However, despite considerable effort by Refuge law enforcement staff, the house fell victim to arson shortly before funds were actually approved for its repair.

Refuge Management & Use

Land Acquisition History

As of 2007, Back Bay Refuge contained 9,035 acquired acres within the official Refuge Land Acquisition Boundary. The Refuge is located within the City of Virginia Beach and was established by Federal Executive Order in 1938. Not including open water, the original Refuge land area contained 4,589 acres. For the next half century no additional land acquisition occurred. In 1989 an Environmental Assessment proposal was put forth to acquire additional land west and north of the original Refuge boundary. This would expand the boundary and more than double the size of the Refuge to 11,000 acres. The purpose of the expansion was to provide long-term protection of wildlife habitat and water quality, as a result of potentially threatening urban development into the rural environment of the Refuge. Land acquisition began in 1991 at the rate of about 350 acres per year, though the largest portion of the expansion occurred by 1993.

Staffing and Budgets

As of 2007, Back Bay NWR had thirteen full-time staff positions. The organizational chart (see page E-1) indicates type and relationship of positions.

Table 3.8 indicates permanent staff, operations and maintenance budgets over the past eight years. Since 1997 staffing has remained relatively stable at 12 Full time employees. The high 1996 Full time employees relates to unfilled vacancies within the organizational chart. 2003 staffing consists of twelve permanent employees:

Table 3.8. Refuge budgets from 1996 to 2006

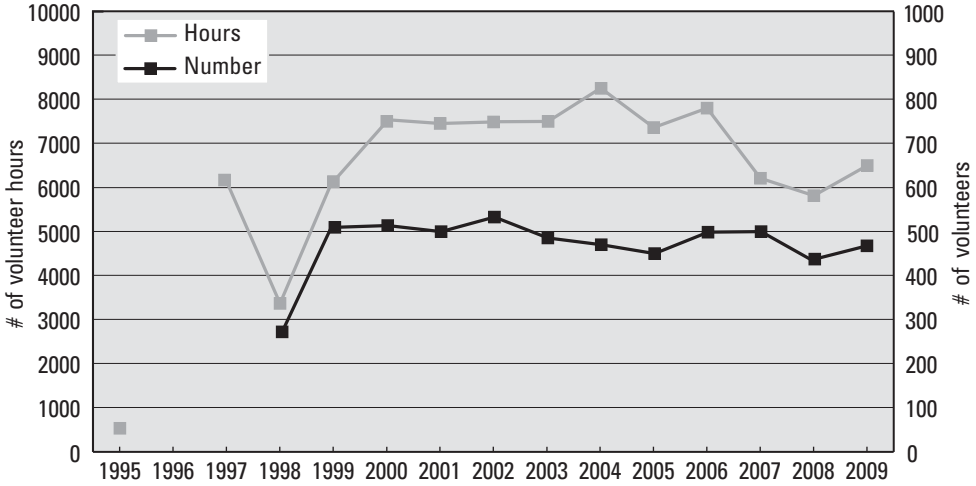
Year	FTE	Operational Funding	Maintenance Funding
1996	20.3	$604,100	$100,000
1997	11.4	$582,900	$49,100
1998	11.8	$646,000	$81,300
1999	12.8	$748,100	$70,000
2000	13.2	$803,300	$241,000
2001	13.6	$840,400	$697,000
2002	12.6	$876,700	$85,800
2003	13.0	$1,095,405	$504,421
2004	13.0	$1,093,328	$339,369
2005	13.0	$1,363,832	$339,345
2006	13.0	$1,034,775	$503,720

Operations funding includes those funds used for such things as salaries, new purchases, contracts, and new construction. Since 1996, there has been a steady increase in operational funding. These increases mostly reflect increased fixed costs and salaries. In 2003 an additional $213,000 Refuge Operations Needs system (RONS) project went for the Horn Point canoe launching facility.

Maintenance funding is used for maintaining existing infrastructure. Prior to 2000, maintenance funding was usually less than $100,000 per year. In 2000, 2001, and 2003 there were large outlays for maintenance. In 2000, they went for dredging, a bulkhead study, and a beach access ramp. In 2001, they went to replacing a front-end loader, dozer, farm tractor, and radios. In 2003, they went for a boat ramp and replacing a bulkhead. Since 2003, annual maintenance funding has remained above $300,000.

Past records on volunteer assistance toward Refuge operations indicate a dramatic increase in the number of volunteers and hours from 1998 to 2000, with a steady average of nearly 500 volunteers and 7,650 hours (Figure 3.22).

Figure 3.22. Total Number of Volunteers and Volunteer Hours between 1995-2009



Refuge Revenue Sharing Payments to Counties and Towns

Back Bay NWR contributes directly to the Virginia Beach economy. Since 1935, the U.S. Fish and Wildlife Service has made Refuge Revenue Sharing payments to counties or towns for refuge land under its administration. Lands acquired by the Service are removed from the tax rolls; however, under provision of the Refuge Revenue Act the local unit of government receives an annual revenue sharing payment. This amount may equal or exceed the amount that would have been collected from property taxes if it had been held in private ownership.

Table 3.9 indicates the amount paid to Virginia Beach from 1981 to 2003. Since 1993 Refuge lands have been appraised between $5,000 to 6,000 per acre. This has brought in roughly $200,000 revenue sharing dollars per year, although this amount has been declining over the past decade. The peak payment amount occurred in 1994, at $269,771 and declined to $172,686 in 2000.

Table 3.9. Refuge Revenue Sharing Payments to City of Virginia Beach, 1981–2007

Year	County Payment
1981	109,867
1982	----------
1983	96,589
1984	
1985	173,697
1986	162,082
1987	159,105
1988	191,834
1989	210,102
1990	252,583
1991	250,512
1992	----------
1993	269,082
1994	269,771
1995	201,681
1996	224,636
1997	207,032
1998	198,732
1999	186,001
2000	172,686
2001	182,178
2002	183,917
2003	177,716
2004	157,256
2005	179,661
2006	168,861
2007	$165,907

Refuge Infrastructure

Established in 1938, Back Bay NWR has established a significant infrastructure to support the Refuge mission and purposes. This infrastructure includes roads and parking areas, buildings, trails, water control structures, kiosks and signs, and other items displayed in Table 3.10 below. All of these are important elements

that support our administrative, biological, visitor services and maintenance programs. In addition to the infrastructure, the Refuge has a long list of personal property assets, such as vehicles, boats, heavy equipment, computers, etc. that serve day-to-day Refuge operations. Currently, the Refuge has over 8 miles of dike roads, which form 13 wetland impoundments managed by 25 water control structures and two pump stations. In addition, the Refuge has 1.3 miles of paved road with several visitor parking lots. There are four buildings and a pole shed supporting maintenance operations and equipment storage. The headquarters/ Visitor Contact Station, environmental education center, fee booth, five trails, and various public access sites provide support to Refuge visitors. There are also four houses used for government quarters or storage.

Table 3.10. Refuge Infrastructure

	Tract No.	Year Built	Size
Levees, Dikes, Water Control Structures, Bulkheads			
Impoundment Dike Roads, Earth Fill / Gravel	Tract 39	Rehabilitated in 1992	7.2 miles
Colchester Impoundment Dike Roads and Parking Lot, Earth Fill	Tract 141	2002	1.4 miles
A-Pool Water Control Structures (3)	Tract 39	1970	A-Pool 215 acres
B-Pool Water Control Structures (2)	Tract 39	1970	B-Pool 100 acres
B-Storage Pool Water Control Structures (2)	Tract 39	1970	B-Storage Pool 13 acres
C-Pool Water Control Structures (2)	Tract 39	1970	C-Pool 190 acres
C-Storage Pool Water Control Structures (2)	Tract 39	1970	C-Storage Pool 45 acres
C-Storage Pool Pump Station and Channel	Tract 39	1994 & 2000	12-15,000 gpm; 2,000 foot channel
D-Pool Water Control Structure (1)	Tract 39	1992	D-Pool 17 acres
E-Pool Water Control Structures (2)	Tract 39	1992	E-Pool 25 acres
G-Pool Water Control Structures (4)	Tract 39	1992	G-Pool 88 acres
H-Pool Water Control Structures (2)	Tract 39	1992	H-Pool 75 acres
J-Pool Water Control Structures (1)	Tract 39	1992	J-Pool 111 acres
Reforestation Site Water Control Structures (1)	Tract 125a	1994	
Frank Carter Impoundments Water Control Structures (4)	Tract 141	2000	Impoundments 26 acres
Bulkhead - Bay Shoreline at Headquarters	Tract 39	1941 Rehab. in 2007	200 feet
Rip-Rap Breakwall at Headquarters	Tract 39	2007	488 feet
Long Island Bulkhead	Tract 39	1978	1,000 feet

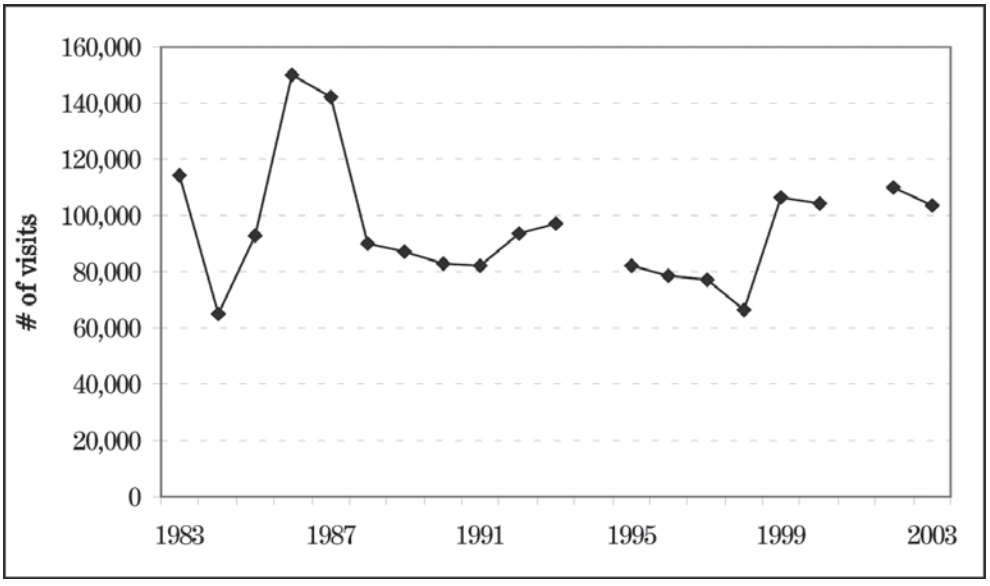
	Tract No.	Year Built	Size
Boat Launch Areas			
Headquarters Employee Boat Ramp and Public Fishing Dock	Tract 39	1941 Rehab in 2007	116 feet
Horn Point Canoe/Kayak Launch	Tract 174	2006	
Headquarters Canoe/Kayak Launch	Tract 39	1985	400 Sq. Ft.
Roads and Parking Areas			
Beach Access Ramp w- gate, Asphalt	Tract 39	2000	0.1 mile; 1 lane
Entrance Road w- gates, Asphalt	Tract 39	1967; gates - 1989	1.2 miles; 2 lane
Visitor Parking Lot, Asphalt	Tract 39	1985	37,697 Sq. Ft.
Horn Point Public Access Site, Entrance Road and Parking Lot, Gravel and Stone Pavers	Tract 174	2006	375 Ln. Feet and 5,625 Sq. Ft.
Reforestation Site Parking Lot, Gravel	Tract 125a	1994	1,200 Sq. Ft.
Colchester Impoundments Parking Area	Tract 141	2002	2,500 Sq. Ft.
Asheville Bridge Creek Environmental Education Center	Tract 151a	1972	
Buildings			
Headquarters/Visitor Contact Station	Tract 39	1985	4,370 Sq. Ft.
Brick Storage/Shop Building	Tract 39	1964	2,228 Sq. Ft.
West Side Maintenance Shop	Tract 151	2006	2,800 Sq. Ft.
Storage Building - Tram	Tract 39	1997	5,500 Sq. Ft.
Fee Booth	Tract 39	1988	64 Sq. Ft.
Asheville Bridge Creek Environ. Education Center	Tract 151a	1972	1,440 Sq. Ft.
Oil Shed	Tract 39	1989	800 Sq. Ft.
Pole Shed	Tract 39	2004	4,096 Sq. Ft.
Maintenance Shop - YACC	Tract 39	1979	2,560 Sq. Ft.
Restroom Facility (Horn Point Access Site)	Tract 39	2006	96 Sq. Ft.
Wildlife Observation Building and Restroom	Tract 39	2006	532 and 96 Sq. Ft.
Horn Point House Government Quarters	Tract 172	1981	2,772 Sq. Ft.
Colchester House Government Quarters	Tract 157	1950	588 Sq. Ft.
Lotus House Government Quarters	Tract 131	1975	1,350 Sq. Ft.
Price House Government Quarters	Tract 135	1973	3,550 Sq Ft.
Trails and Boardwalks			
Bay Trail w/ overlooks	Tract 39	1994	2,250 feet
Kuralt Trail w/ overlook	Tract 39	1998	500 feet
Seaside Trail	Tract 39	2002	900 feet
Dune Trail w/ overlook	Tract 39	2000	1,200 feet
Asheville Bridge Creek Environ. Education Ctr. Trail	Tract 151a	1998	700 feet

	Tract No.	Year Built	Size
Trails and Boardwalks (cont.)			
Outdoor Classroom – ABCEEC	Tract 151	1998	252 Sq. Ft.
Outdoor Classroom - Headquarters	Tract 39	2001	56 feet
D-Pool Fishing Platform	Tract 39	1999	88 feet
Colchester Overlook Platform	Tract 141	2002	432 Sq. Ft.
Information Kiosks			
Headquarters Parking Area	Tract 39	1992	
Kuralt Trail Trailhead	Tract 39	2001	
Bay Trail Trailhead	Tract 39	1993	
D-Pool	Tract 39	2006	
Horn Point Public Access Site	Tract 174	2006	
Asheville Bridge Creek Environmental Education Center	Tract 151a	2006	
Other			
Fire Weather Station	Tract 39	1994	
Directional/Informational Signs	Several		
Chemical Storage Building	Tract 39	2003	96 Sq. Ft.

Refuge Visits

Virginia Beach is a major summer tourist attraction and receives several million visitors per year. A portion of that tourist trade also visits Back Bay. Records going back to 1983 indicate a low of about 65,000 and a high of about 150,000 visits per year (Figure 3.23). Peak visitation in the mid-late eighties was followed by a gradual decline in visits due to the implementation of an entrance fee as well as under-reporting. Recent records indicate a range of 100,000 to 120,000 visits per year, which is a more accurate reflection of actual visits.

Figure 3.23. Annual visits to the Refuge



An electric tram and beach vehicle transportation system, operated by the Back Bay Restoration Foundation (BBRF), provides a two-hour visit to False Cape State Park via the Refuge from Little Island Park just north of Back Bay. The electric trams operate daily Memorial Day through Labor Day, with a reduced schedule the remainder of the year, and the beach vehicle operates November 1 through March 31. The electric tram began operations in 1997. The number of passengers who use the tram has fluctuated between 800 and 1400 in recent years (Table 3.11) (Admire, unpublished data, 2006).

Table 3.11 Visitor use of the tram system

Fiscal Year	Tram Passengers
2000	1623
2001	1685
2002	961
2003	880
2004	
2005	
2006	1324

The Back Bay visitor profile changes throughout the year. Spring visits include local school education, summer visits show an increase in out of town tourists, while the fall sees a shift back to local residents and anglers. Table 3.12 indicates average monthly tram riders for the past four years (Admire, unpublished data, 2000 to 2003).

Table 3.12. Average monthly tram riders

Month	Average Passengers
April	91
May	177
June	201
July	333
August	321
September	139
October	73

White-tailed deer and feral hog hunting are permitted on the Refuge for seven days annually (starting on the first Saturday of October), when the State season opens. An application process is involved to obtain a hunting permit. Applications are usually available at the end of July and are due the first week of September. That process has evolved to a new State-run "Cyberdata" system currently.

Data for the annual Refuge hunt goes back to 1986, the first of the hunt and the peak harvest for deer and hunter use year; when a total of 366 hunters removed 147 deer (Table 3.13). Since then, there has been a general downward trend, except for in 2006 when harvest of both deer and hogs more than doubled from 2005 numbers. During the current seven day Refuge hunting season, a maximum of 62 hunters per day are permitted in the eight hunting units.

Table 3.13. Hunt Harvest Summary, 1986-2006.

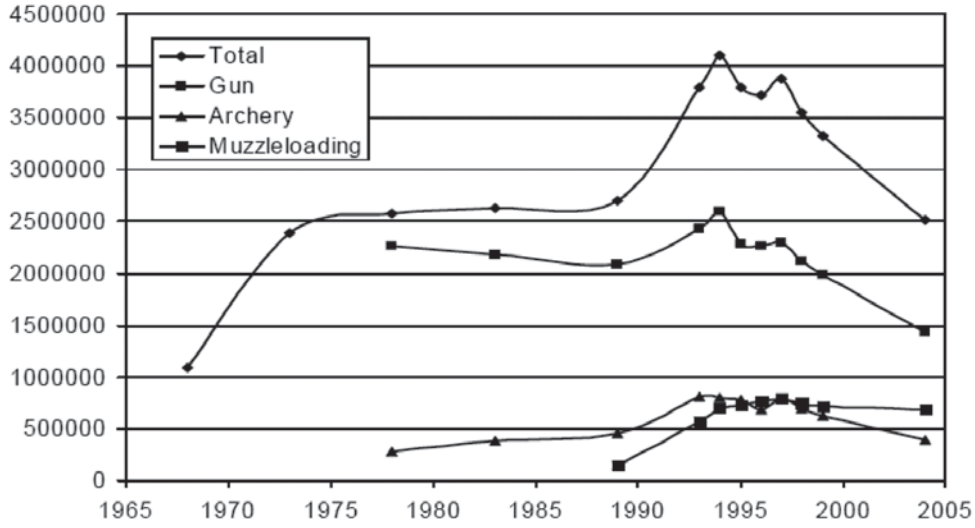
Year	Bucks	Does	Total Deer	Total Hogs
1986	41	106	147	11
1987	25	48	73	6
1988	20	40	60	10
1989	23	15	38	6
1990	15	15	30	1
1991	15	39	54	14
1992	24	24	48	9
1993	16	23	39	19
1994	29	27	56	22
1995	22	24	46	17
1996	25	34	59	38
1997	19	14	33	8
1998	15	16	31	39
1999	16	24	40	21
2000	32	17	49	35
2001	15	17	32	28
2002	8	11	19	37
2003	13	8	21	49
2004	7	10	17	44
2005	7	9	16	26
2006	19	14	33	64

Recreation

Hunting

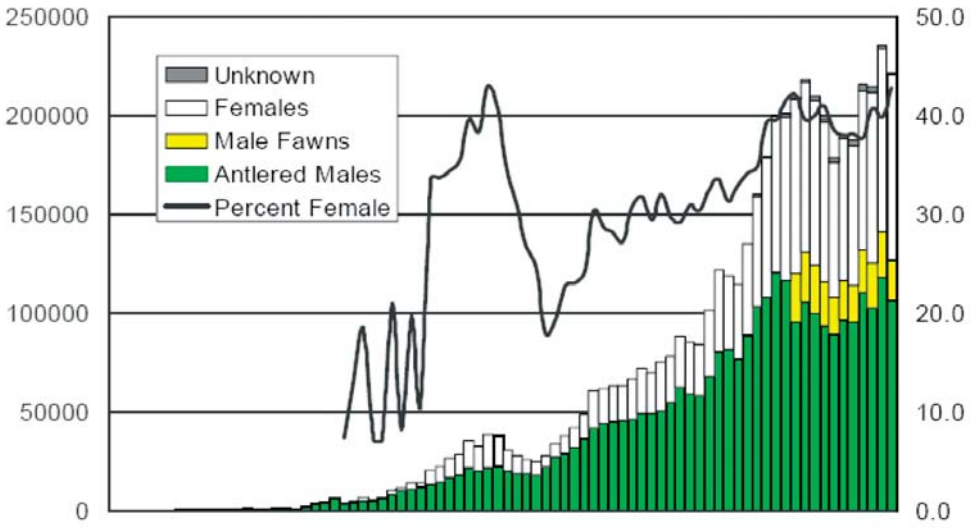
White-tailed deer are the most popular game species in the Commonwealth of Virginia. According to the 2004 to 2005 hunter survey, Virginia deer hunters spent approximately 2.5 million days afield in pursuit of deer. This total includes nearly 1.4 million general firearms hunting days, nearly 395,000 archery hunting days, and over 681,000 muzzleloader hunting days (Figure 3.24). According to 2004 to 2005 license data, there are approximately 240,000 deer hunters in Virginia. During the 2005 to 2006 deer season, 214,675 deer were reportedly harvested in Virginia (VDGIF 2006a). See Figure 2.25 for the number of deer harvested in Virginia Beach between 1923 and 2004.

Figure 3.24. Virginia deer hunter days afield, from hunter surveys, 1968-2005 (Source: VDGIF 2006a)



As a component of the general statewide population, total hunter numbers and their relative representation in Virginia's demographic profile also are decreasing. Individuals must apply to obtain a hunting permit. Over the past decade, the number of Virginia residents who purchase a basic state hunting license has declined 17%. As a percentage of the total population, licensed hunters have declined 26% over the last 10 years (VDGIF 2006a).

Figure 3.25. Virginia deer harvest, 1923-2004 (Source: VDGIF 2006a)



Archery Either-Sex Deer Hunting (VDGIF 2006b)

- Deer of either sex may be taken during all archery seasons, unless otherwise noted below

- Only antlered (buck) deer may be taken during the early and late archery deer seasons in Buchanan County, on private lands in Dickenson County, and on private lands in Wise County. Deer of either sex may be taken during the archery deer seasons on public lands (National Forest and U.S. Corp of Engineer) in Dickenson County and Wise County.

  Early Archery Season:
  October 1-November 18: Statewide

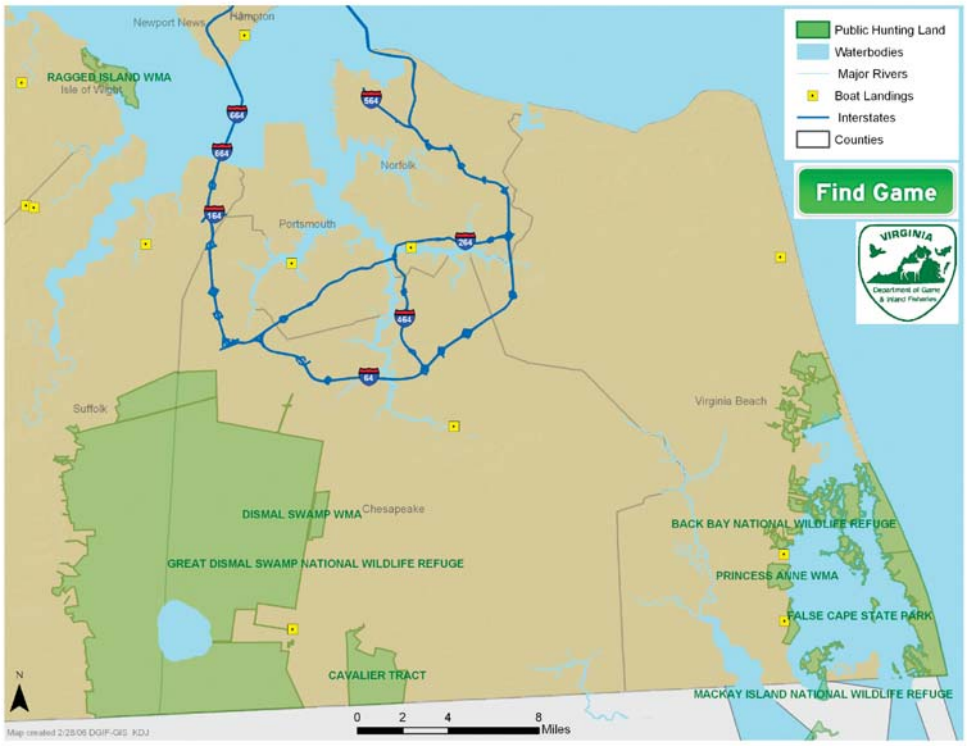
  Late Archery Seasons:
  December 1–January 7:
  - In the cities of Chesapeake, Suffolk (east of the Dismal Swamp line), and Virginia Beach.

Firearms Either-sex Deer Hunting For Incorporated Cities and Towns

- In the cities of Chesapeake, Suffolk (east of the Dismal Swamp line) and Virginia Beach:

  Either-sex Deer Hunting Days:
  November 24-30
  - In the cities of Chesapeake and Virginia Beach.

Figure 3.26. Deer Hunting Areas in the State of Virginia (Source: Jenkins, VDGIF, 2006)



Fishing
Within the City of Virginia Beach, Back Bay, Lake Whitehurst and Lake Trashmore provide the best fishing opportunities. With more than 25,000 acres, Back Bay is the largest body of water in the district. It produces good white perch and channel catfish at times, some flounder, and other saltwater and brackish water species. Many citation channel catfish are caught in the tributary creeks in the spring, as fish move into fresher water to spawn. The freshwater creeks feeding into the bay have largemouth bass, crappie, and bluegill. Bank fishing is limited and available only in some of the tributary creeks. Some fishing is available at the state-owned boat ramps on Mill Landing Road, Back Bay Landing Road, and some private ramps. Several private launch ramps are available on the bay and feeder creeks off Princess Anne and Muddy Creek Roads. The Refuge offers fishing in Back Bay, along the shoreline and from a fishing pier and boardwalk in front of the headquarters/visitor contact station; and, at the Horn Point Canoe/Kayak Launch. Fishing is also provided in D-Pool, a small impoundment a short walk from the visitor contact station. Saltwater, surf fishing is allowed along the beach (except the "North Mile").

Lake Trashmore offers fishing for largemouth bass, sunfish, and white perch. Lake Whitehurst has become a walleye hot spot, with many fish in the 4 to 6-pound range. It is one of the few lakes in the state where anglers have been able to catch walleyes with any consistency.

North Landing and Northwest Rivers also provide great fishing opportunities in the City of Virginia Beach area. Anglers will find a wide variety of fish in these waters, both freshwater and brackish. Common fish in the North Landing River include largemouth bass, bluegill, pumpkinseed, yellow perch, white perch, and white catfish. The Northwest River has fewer brackish water species than the North Landing River. White perch and white catfish are not as common, while Bluegill and pumpkinseed sunfish are abundant. The Northwest River also has some black crappie and chain pickerel (VDGIF 2006c).

Environmental Education
The Refuge has an active environmental education program, with the focus on providing on-site and off-site program delivery to elementary school children. Currently, more than 4,000 school children from more than 60 schools visit the Refuge annually. To a lesser degree, area middle schools, high schools and colleges also participate in environmental education programs and internship projects. Many other groups and organizations seek environmental education experiences on the Refuge, including community, church, youth and interest groups, as well as scouting organizations. The Refuge's web site is growing in popularity, serving as an additional means for individual environmental education experiences.

The trail system around the Refuge headquarters, an outdoor classroom, pond activity pier, the oceanfront, bay and impoundment areas all serve as environmental education resources for individuals and groups. A number of self-guided interpretive kiosks and panels are strategically located throughout the Refuge, with the highest concentration in the Refuge headquarters area. Attached to the Refuge headquarters is the Visitor Contact Station, which houses exhibits and educational publications, as well as audiovisual programs. On the Refuge's west side, a recently acquired 17 acre home site has been converted to the Ashville Bridge Creek Environmental Education Center. It consists of a 1,500 square foot home that has been converted to a classroom accommodating 40, a short nature trail, activity pier/canoe launch, outdoor classroom, and a resource library. An agreement with Mr. John Cromwell, the adjacent farm property owner, provides a cooperative environmental education opportunity

for groups to learn about ecologically compatible farming practices. The Back Bay Restoration Foundation assists Refuge staff in planning, organizing and conducting environmental education activities. The Refuge also partners with neighboring False Cape State Park and area interest groups, such as Audubon, Ducks Unlimited and The Izaak Walton League, in the delivery of environmental education programs and special events. The Refuge is also an active partner with The Virginia Beach school system in its Partners In Education program. Together with the help of its many partners the Refuge is able to offer a wide variety environmental education opportunities to its visitors.

Interpretation
The Refuge plans, organizes and delivers a wide variety of personal and non-personal service interpretive programs for the general public, using staff, volunteers, and interest group representatives. More than 5,000 visitors annually participate in formal interpretive programs offered by Refuge staff or partners. Thousands more take advantage of self-guided interpretive opportunities afforded by publications, exhibits in the Visitor Contact Station, trail-side signs, kiosks, and the Refuge's web site. Guided programs take place through tram, bicycling, "Terra-Gator" beach vehicle tours, talks, guided walks, demonstrations, and audiovisual presentations. A reference and interpretive publication library is available for students and teachers at the Ashville Bridge Creek Environmental Education Center (ABCEEC). As an urban interface Refuge, there is considerable demand for the Refuge to provide both on and off-site interpretive programs and facilities. The existing public area in the Visitor Contact Station has square footage to accommodate 30 people at one time for formal, indoor interpretive program delivery. The ABCEEC classroom facility can accommodate 40 people at one time.

Most programs take place at the Refuge headquarters area, at the Visitor Contact Station, on the beachfront, or at the ABCEEC. Monthly interpretive calendars are produced, with program schedules and descriptions. Most programs require advance registration and program groups are generally limited to 20 people. Due to the seasonal nature of visitation, most formal programs are delivered during the peak use months of April through September. The Refuge tram system, operating daily from April through October, provides a means of transporting visitors though the Refuge to False Cape State Park, and is a popular and valuable interpretive programming tool, with guided tram tours scheduled on a regular basis.

Wildlife Observation
A variety of structured, as well as unstructured, opportunities exist for wildlife observation on the Refuge. In addition to migratory waterfowl, there is the chance for visitors to observe several hundred species of songbirds, raptors, including bald eagle and osprey, red and gray fox, feral horses and hogs, white-tailed deer, and many other mammals, as well as reptiles, crustaceans fish. The Refuge's six different habitat types also present a wonderful opportunity for visitors to view wildlife in diverse landscape settings containing common and unique vegetation specific to each habitat type. Habitats include beach/dune grasslands, barrier island woodlands and shrub-scrub, fresh-water marshes, forested swamp, lowland forest and agricultural fields.

Visitors can participate in wildlife viewing opportunities in a self-guided manner, by special use permit for larger groups, by reservation for school groups, or by participating in guided, developed interpretive programs and activities for the general public. Tours are conducted on a scheduled basis by foot, bicycle or tram. Spring and fall are the best seasons for this type of activity, although the nature of tourism in the Virginia Beach area brings many visitors out to the Refuge to view wildlife in the summer months, as well.

Refuge resources that support wildlife viewing include self-guided interpretive kiosks, brochures and publications, outdoor classrooms, nature trails, observation piers, fixed viewing scopes, impoundment dike roads, the Refuge web site, interpretive staff and partners, a small Visitor Contact Station with audiovisual programs and exhibits, and the 17 acre Ashville Bridge Creek Environmental Education Center (ABCEEC) site, with associated classroom facility, nature trail and activity pier, and the Refuge's Reforestation Site. Water-born wildlife viewing is also possible from Back Bay and its watershed. A public canoe/kayak launch ramp at the Refuge headquarters, as well as several others surrounding Back Bay, help facilitate water-born wildlife viewing opportunity on the Refuge. Organized groups are afforded the opportunity to sign out binoculars, guide books, and other supplies and materials on loan that serve to enhance the wildlife viewing experience.

Much of the effort of Refuge staff in recent years is focused on attempting to transition some of the public use for wildlife viewing and other environmental education experiences from the Refuge headquarters area to the ABCEEC site, which was opened in October of 1999. There is considerable pressure, especially from interest groups, to access the Refuge impoundment area during the November through March closure, in order to take advantage of wildlife viewing opportunities during peak waterfowl migration season. Directing and controlling visitor use for this type of activity to safe and accessible open areas, while protecting closed areas, sensitive habitat, and protected species is also an ongoing effort and workload for Refuge staff.

Key Refuge partners, including the Virginia Department of Game and Inland Fisheries, the Virginia Eco-Tourism Association, the Back Bay Restoration Foundation, False Cape State Park, and the Virginia Beach and Cape Henry chapters of Audubon all help to promote wildlife viewing on the Refuge. The Virginia Coastal Birding and Wildlife Trail, a new major wildlife viewing project expected to be completed by 2005, includes the Refuge as a primary destination to those seeking high quality wildlife viewing opportunity in the Hampton Roads area. The demand for wildlife viewing opportunity, especially birding, and pressure for related support services and facilities is expected to grow dramatically throughout the decade.

Photography
The opportunity for nature photography on the Refuge is as varied as its wildlife and habitat types. Currently, this type of use is permitted in all open areas of the Refuge, and may be approved through special use permits where appropriate in other situations. Although relatively passive in nature, concerns with this type of activity include wildlife disturbance and the possibility of habitat degradation. Photographic use is not currently limited by regulation to existing roads, trails or other developed areas, such as viewing blinds. This type of use on the Refuge is, to a large degree, associated with wildlife viewing, so many of the resources and facilities necessary to support this activity are the same. Trails, activity/viewing piers, impoundments and associated dike roads, Back Bay and the Refuge's ocean beachfront all provide ideal backdrops for wildlife photography. Pressure to use the Refuge for commercial wildlife photography is minimal. Several interpretive programs are scheduled throughout the year that highlight and encourage nature photography on the Refuge. In addition to interpretation, other workloads generated by this type of use include monitoring, enforcement, and special use permitting.

Land Use

Prime Farmland
Cooperative farming has been permitted to occur on newly acquired lands that were farmed prior to acquisition since the early 1990s. Farming supports the local economy while maintaining the disturbed status of the land, in the event that a better use for it is determined. Agricultural farming is prevalent in the

surrounding community. At present, three cooperative farmers manage a total of 100.5 acres of Refuge farmland. Only corn and soybeans are grown on these lands and only approved pesticides and herbicides are permitted. Genetically modified crops are not permitted.

An exchange for services or annual fee system is often utilized for farmed crops. Services provided contribute significantly to habitat maintenance support within Refuge grasslands and moist soil units each year. The cooperative farmer's equipment and manpower are used to mow, disc, root-rake and apply herbicide to Refuge habitats; and saves additional costs to the Refuge to perform this work and/or contract it out. Cooperative farming provides many valuable habitat maintenance services that the Refuge could not otherwise afford.

Timber
Most Refuge forested habitats are not yet mature, and are principally lowland/bottomland types. As a result, their timber values are not very high. However, limited logging could be in accordance with good forest management practices aimed at restoring native tree diversity.

The barrier island portion, along the western side of A-Pool, includes a young remnant maritime forest. It includes such southern species as live oak and pond pine, together with the usual red maple, sweetgum and loblolly pine. Other lowland forests exist along the western side of Back Bay, in the Nanney Creek, Beggar's Bridge Creek, Muddy Creek and Hell Point Creek vicinities, and along the northern and southern sides of Sandbridge Road. They consist primarily of red maple, bald cypress, sweetgum, black gum/tupelo, white oak, laurel oak, southern magnolia and scattered loblolly pine. Waxmyrtle, high-bush blueberry, and groundsel shrubs are also scattered about the forest floor, together with several ferns, vines, canes and greenbriers. In several older growth locations, very large trees exist that should be protected and preserved.

During the late 1990's, RTNCF refuges' foresters and biologists visited RTNCF forested habitats, including the "Green Hills" area. They theorized that the remnant maritime forest along the western side of A-Pool may have formerly been a longleaf pine-live oak forest that was clear-cut, and replaced by the existing (red maple, sweetgum and loblolly pine) tree species.

A small 2 acre tract of planted Atlantic white cedars exists immediately south of Sandbridge Road. This entire 15-acre field (behind the cedar stand) was also planted to a variety of oaks, green ash and bald cypress in 1994 and 1995. The intent was to recreate a unique mixed bottomland hardwood-softwood forest as could have existed during pre-settlement times. The 2-acre white cedar concentration was fenced to prevent deer browsing. Subsequent monitoring of this "Wetlands Reforestation Site" revealed that nearly all oaks, cypress, white cedar and green ash planted outside the fenced area, were destroyed by deer-browsing during winters of the late 1990s. The previously planted areas outside of the fenced cedar stand, have succeeded naturally to loblolly pine, groundsel/saltbush, sweetgum and blackberry. The white cedars within the fenced area have survived, and natural regeneration has been observed since 2000. The cedar stand has been thinned annually to reduce competition for sunlight, by loblolly and groundsel/saltbush. However, progress has been force-account, and slow. Currently the eastern end of the stand contains a strip of tall loblolly pines (15') that are out-competing existing cedars.

Chapter 4



USFWS

Eastern B-Pool during spring, prior to draw-down for shorebird feeding

Management Direction and Implementation

- Introduction
- Goals, Objectives, and Strategies
- Other Management Activities

Introduction

This chapter is in two parts. In combination, the chapter describes the array of management objectives that, in our professional judgement, work best toward achieving the refuge purposes, the vision and goals developed during the planning process, and the goals and objectives of other Service, State and regional conservation plans. We believe in implementing these actions will also effectively address the key issues raised during plan development.

The first part, "Goals Objectives an Strategies," describes refuge actions that were developed to achieve specific goals and objectives.

The second part, "Other Management Activities", describe refuge actions that were common to all the alternatives in the draft CCP/EA and will be implemented on the refuge

Some strategies do not specifically interconnect with any of the seven goals developed for the CCP. For example, the strategies and actions related to cultural, archaeological and historic resources may not fit under habitat or public use goals, but are important nonetheless.

Goals, Objectives, and Strategies

GOAL 1. **Maintain and enhance the biological integrity and diversity of wetland habitats for migratory birds including species of conservation concern.**

Objective 1a. Impoundments- Migrating/Over-wintering Waterfowl and Migrating Shorebirds

- Manage 906 acres of 13 freshwater impoundments at Back Bay NWR, plus 165 acres of two freshwater impoundments at False Cape State Park, to meet the habitat needs of migrating and wintering waterfowl and shorebirds. This objective shall be aimed at providing quality habitat that maintain or increase existing levels of migratory waterfowl and shorebird use. Acreage and location of each habitat type may vary from one impoundment to another from year to year, depending upon the wetland dynamics, vegetation management, and plant successional changes that occur within each impoundment. Management efforts would be directed to provide approximately the following habitats each year:

- Emergent Marsh (Spring: March – April): Provide approximately 400 acres (on both the Refuge and False Cape State Park) of shallow, flooded (6”-18” water depth), mixed annual and perennial marsh vegetation remnants of the previous growing season. These relatively open-water habitats shall serve as both resting/roosting and feeding areas for migrating waterfowl.

- Shallow Water Mudflats (Spring: Late April – May): Provide approximately 350 acres (on both the Refuge and False Cape State Park) of feeding habitat for migrating shorebirds. Consisting of shallow water (<4” deep) to mudflat habitat with sparse to no vegetation (<15% coverage), during the normal peak shorebird migration of early to mid-May. This habitat would consist of a minimum of 10 patches; each 5-80 acres . 180 acres should consist of shallow water wetlands (0"- 3" deep) interspersed with exposed, wet mud/sand flats. Encourage the production of invertebrates for shorebird food at a density of 4 grams of invertebrates per square meter.

- Emergent Marsh (Summer: July – Aug.): Provide a minimum of 200 acres of high quality feeding habitat for wading and marsh birds. This habitat would consist of open, shallow water (2”-10" deep) with patches of emergent wetland plants that support fish, invertebrates and amphibians. Said habitat should be

provided in a minimum of 4-6 patches of at least 50 acres each. Highest quality areas are those patches where prey is concentrated following water drawdown.

- Shallow Water Mudflats (Fall: Late Aug. – Sept.): Provide approximately 200 acres of feeding habitat for migrating shorebirds. Consisting of shallow (<15cm) water depth to mudflat habitat, with sparse to no vegetation (<15% coverage), during the normal peak shorebird migration of early September. Patch size shall be a 5-80 acres each although patch availability changes between spring & fall together with patch location.

- Emergent Marsh (Fall: Late Aug. – Oct.): Provide approximately 350 acres of feeding and resting habitats for migrating waterfowl. Habitats shall consist of shallow flooded (<12" water depth) marshes with vegetation dominated principally by large-seeded perennial, and smaller seeded annual, marsh plants (e.g. sedges, rushes, smartweeds, and threesquare, mixed with smaller areas of moist-soil annual plants, beggar's ticks, wild millets, water hyssop, bulrushes and submerged aquatic vegetation. Patch sizes shall be at least 15-20 acres.

- Wetland Mosiac (Wintering: Nov. – Feb.): Provide approximately 830 acres (on both the Refuge and False Cape State Park) of feeding and resting habitats for waterfowl. These areas shall consist of approximately 750 acres of emergent marshes, moist soil units and shallow open-water areas; plus an additional 80 acres of deeper, open-water habitat with submerged aquatic vegetation for diving waterfowl.

- Emergent Marsh-Cattail, Needlerush, Bulrush (Year-round): Provide approximately 450 acres (on both BBNWR & FCSP) of feeding, nesting and resting habitat for rails, bitterns and the common moorhen. Habitats shall consist of dense (>80% coverage), robust vegetation (cattail, needlerush and bulrushes) that occurs in patch sizes of at least 25 acres. Water depths during the breeding season shall range between 0"– 12".

Strategies:
Continue to:

- Annually provide at least 325 acres of quality waterfowl stopover and wintering habitat, consisting of shallow, flooded wetlands (6"-18" water), dominated principally by large-seeded, perennial marsh vegetation, with some mixed, fine-seeded annuals.

- Annually provide at least 350 acres of quality waterfowl stopover and wintering habitat consisting of shallow, flooded wetlands (<7" water), dominated principally by mixed large and fine seeded, annual, moist-soil vegetation, with some perennials.

- Annually provide at least 60 acres of open, deeper-water (>1.5') wintering habitat for such diving ducks as the lesser scaup, ruddy duck, bufflehead, hooded merganser, coot and pied-billed grebe.

- Annually provide a minimum of 6 patches of feeding and roosting habitat at least 20 acres in size, for migrating shorebirds. These habitats should consist of wetlands where shallow (0"- 4") water and wet sand/mud flats make up the majority of the area.

- Each summer (July and August) provide a minimum of 350 acres of quality feeding habitat for wading and marsh birds. This habitat shall consist of an average mix of open, shallow water, with patches of emergent marsh plants, with an average water depth of 4"- 5". This habitat should be provided

in a minimum of four patches of at least 50 acres each that support good populations of fish, insects and amphibians.

- Year-round, provide a minimum of 25 acres of "watchable wildlife" habitat for the visiting public during the winter impoundments' closure period. "Watchable wildlife" species include the snow goose, ducks, herons, egrets and ibis.

- Provide a minimum of 10 acres of quality fresh-water, year-round, fishing habitat, consisting of an average 60% mix of vegetation and open water with an average water depth of 2'- 3'. This fresh-water habitat should support viable populations of bluegill, pickerel, large-mouth bass and sunfish.

- Annually provide at least 250 acres of mixed stands of black needlerush and phragmites reed to continue supporting existing breeding populations of least bitterns; and as spring migration stop-over habitat for the Sora rail and bitterns in North Bay Marshes.

- Minimize use of the impoundments by competing non-migratory wildlife such as the resident Canada goose, feral pig, nutria and feral horse. Since these species also consume large amounts of young wetland plants meant to provide wintering waterbirds with food during their fall migration and winter, resident species' use of Refuge impoundments presents a direct conflict with impoundment management objectives and must be curtailed where possible. Resident Canada goose numbers may be reduced by shooting and egg addling during their nesting season. The feral pig and nutria may be controlled by shooting/hunting and trapping. The feral horse may be controlled by capturing and transporting horses to North Carolina, with the support of local citizens and the Corolla Horse Association.

- Conduct waterbird surveys in the impoundments up to three times per month to determine if impoundment objectives aimed at sustaining moderate numbers of migrating and wintering waterbirds are being met.

- Close dikes to public access from November through March to reduce public disturbance to wintering waterfowl.

- Conduct ground surveys of vegetation in three larger impoundments once a year to assess waterfowl food production and monitor invasive species distributions.

- Annually treat (disk and/or burn) up to 250 acres of the total 1,130 acres of the main impoundments, including False Cape State Park's two impoundments and 26 acres at the Carter impoundment.

- Gradually flood for waterfowl during winter; draw-down for shorebirds and waterfowl during spring and fall migrations; and extreme draw-down for wading birds during mid-summer.

- Provide maximum beneficial waterbird food-plant and invertebrate production, by draw-downs of moist soil units during spring; exposing substrates of the eastern sections of impoundments. Maintain wet soils in those eastern areas throughout growing season.

- Remove brush (principally recurring waxmyrtle) that is too large to bush-hog. by root-raking. Live oaks would be allowed to remain.

- Mow herbaceous and grassy, dense perennial vegetation. Follow with flooding to provide wintering waterfowl access to rootstocks. May be an occasional substitute for prescribed burning; but does not remove undesirable seed-stock.

- Provide water to the East and West False Cape State Park (FCSP) impoundments via two water control structures in the Refuge south dike of A-Pool.

In addition:

- Hunting. Remove as many feral hogs and white-tailed deer as possible from the 880 acre impoundment complex. Both compete for food raised by Refuge management actions for wintering and migrating waterbirds. Consider increasing hunting season(s) if practical.

- Develop an Adaptive Management Framework for phragmites control so that treatments are monitored and evaluated for effectiveness. The refuge will be using an integrated approach to phragmites control, which will consider restoration of natural processes, herbicides, prescribed burning, and other tools as they are developed.

- Consistent, annual control through use of EPA-approved systemic herbicides (for use in wetlands). Herbicide applications shall occur via aerial and/or backpack spraying. Expanded aerial control efforts would focus on larger stands, while backpack spraying would be used to treat remaining small patches.

- Work with cooperating private property partners to treat areas on land adjacent to Refuge lands that have dead phragmites stands from prior control efforts. This would require the formation of new Refuge partnerships and written agreements.

- Increase feral hog control efforts through additional advances in the cooperative research effort with VDGIF. Additional efforts may include: permitting selected trappers to run traps for year-round feral hog population control as needed through Special Use Permits; working with State biologists to assess Refuge feral pig population through a mark-recapture, ear-tagging program; increased shooting by Refuge staff or permitting sharpshooters; and/or increasing public hunting opportunities.

- Cattail – When cattail presence exceeds 50% of the cover within the impoundment, control is warranted. Control would consist of mowing/burning and subsequent flooding.

- Feral Cats – Control feral cats when they are spotted on the Refuge by lethal means (i.e., shooting with small caliber rifle or shotgun) or by trapping.

- Feral Horses – Work with Currituck NWR and False Cape State Park to effectively and cooperatively manage feral horses. In addition, work with the Virginia Wild Horse Rescue round-up and remove horses to remove horses when contacted by Refuge personnel or Sandbridge residents.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement

of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- Monitor and evaluate waterfowl, shorebirds, and wading birds use of intensively managed Refuge habitats. These surveys will determine whether the Refuge is maintaining or improving shorebird and waterfowl use during the spring and fall migrations; wading bird use during the late summer and fall; and wintering waterfowl use.

- Continue to conduct callback surveys for secretive marsh birds to monitor overall diversity, evaluate habitat use patterns and identify potential areas for habitat protection of enhancement projects.

- Implement Service-approved monitoring techniques, where appropriate, in keeping with Regional and National protocols and other standards.

- Conduct vegetation surveys to determine when cattail presence exceeds 50%. Monitor presence of Canada geese, feral hogs, and feral cats and control these species as necessary to protect refuge resources.

Objective 1b. Wetland Biological integrity (Emergent Oligohaline Marsh & Open Water Coves)

Restore, enhance and maintain biological integrity of native wetland plant communities throughout the impoundment complex and up to 4,000 acres of wetlands within Refuge islands and the Back Bay watershed so that forested wetland habitats are restored, submerged aquatic vegetation (ie. Sago pondweed, wild celery, southern niad/bushy pondweed, widgeon grass, redhead grass, muskgrass and nitella) is restored to >50 stems per acre in 40% of open-water habitats for wintering/migrating waterfowl. In addition, water quality levels are improved to good to excellent based on Virginia Department of Environmental Quality standards. Benefiting species include migrating/wintering waterfowl (e.g. Gadwall, American widgeon, American coot, American black duck and Tundra swan), migrating and breeding marshbirds (e.g., Least bittern, King rail, and Pied-billed grebe), and migrating shorebirds (e.g. Short-billed dowitcher, Lesser yellowlegs, Semipalmated sandpiper).

Rationale

One of the establishing purposes of the refuge is to protect and conserve wetlands. Eighty percent of America's breeding population and more than 50 percent of its 800 species of protected migratory birds rely on wetlands (Mitsch and Gosselink 1993, citing Wharton, et al. 1982). Over 95 percent of the commercially harvested fish and shellfish species are wetland-dependent. Most freshwater fish depend on wetlands for spawning, and anadromous fish rely on them as nurseries for young fry. Wetlands also provide essential ecosystem functions that technology has yet to rival such as flood mitigation (especially riverine wetlands), storm abatement and filtering and removing nutrients and toxic material. Wetlands also are significant for global cycles of nitrogen, sulfur, methane and carbon dioxide (Mitch and Gosselink 1993).

The several distinct types of wetland habitat on the Refuge include:

- Freshwater emergent marsh (also known as palustrine emergent wetlands);
- Freshwater wooded swamp (also known as forested wetlands, dominated by trees or shrubs);
- Riparian forested wetlands (along the lowland margins and also known as bottomland hardwood forest) which receive only occasional flooding from adjacent waterways, but may also flood from heavy rains and sheet-flow from adjacent uplands.
- Open-water coves, ponds and potholes (commonly found within bottomland forests, bay islands and emergent marshes. Often these harbor dense concentrations of submerged aquatic vegetation, which in turn attract fish and waterfowl.

Freshwater marshes are composed of emergent vegetation such as narrow-leaved cattail, black needlerush, big cordgrass, pickerelweed, arrowheads, bulrushes and spikerushes. Salinity levels seldom exceed 3.0 parts per thousand, and are often in the 2.0-2.5ppt vicinity. They host priority birds such as the American black duck, pintail, wood duck, mallard, green and blue-winged teal, common snipe, solitary sandpiper, spotted sandpiper, marsh and sedge wrens (a species of high priority in the BCR30 Plan), American bittern, least bittern, sora rail and king rail. Forster's and royal terns forage in the associated open waters in summer. Those areas contain most of the important nursery and spawning habitat for several important fish species that, in turn, provide an important food source for herons, eagles, ospreys and fish-eating waterfowl. During winter hundreds to thousands of Tundra swans, gadwalls, widgeon, coots, scaup and redhead ducks feed over beds of submerged aquatic vegetation.

Refuge forested wetlands or wooded swamps are described in the Forest Management section (Objective 2.c). below. Vegetation in these wetlands can withstand long periods of root zone saturation during the growing season. They support such priority bird species as the Louisiana and Northern waterthrushes, Prothonotary warbler, Worm-eating warbler, Red-headed woodpecker, Black duck and Wood duck.

Riparian forests have shorter periods of flooding and support forest species that are similar to those in higher elevation forests. For that reason, we discuss the objectives, rationale, and strategies for this community type separately in Objective 2c below.

Controlling and preventing the spread of invasive plants, particularly Common reed (Phragmites australis), is an essential component of wetland protection and management in the Atlantic coastal states. It spreads rapidly, displaces native vegetation and gradually raises the height of the marsh floor, altering the hydrology of the marsh. That poses a conservation threat to wetland-dependent fish and wildlife species that evolved with the historic vegetative communities that provide food, nest substrate, spawning habitat, or cover at different times in their annual life cycles. The Refuge Phragmites control program has been a long-standing one that has expanded greatly during the past 3 years.

All Refuge lands that border wetlands or open water now have at least 100-foot buffers in grassland or woody vegetation; but much more of the Back Bay Watershed remains that needs buffering and protection within the entire refuge acquisition boundary. Water quality protection is a principal concern of the Refuge.

Protecting large blocks (>50 acres) of all types of wetland habitat in the Refuge will improve the success of nesting, foraging, and resting wetland-dependent species, including the American black duck, seaside sparrow, marsh and sedge wrens, mallard, northern pintail, wood duck, least bittern, king, Virginia and sora rails, common snipe, as well as the blue and green-winged teal. Forested swamp species will also benefit, such as the prothonotary warbler, Louisiana waterthrush, red-headed woodpecker, and bald eagle (which nest in woodland edges) and are all identified in the BCR 30 plan and the VA Wildlife Action Plan.

Strategies:

Continue to:

Control pests other than phragmites including non-native, invasive species and other pest plants and animals in Refuge wetlands.

- Japanese stiltgrass. Use Sethoxydim herbicide, or other suitable herbicide, to control Japanese stiltgrass, starting in the Refuge headquarters vicinity. However, the feasibility of successfully controlling this pest plant that has become so entrenched throughout the Refuge is still under review. Limited control in higher priority areas may be the only feasible solution.

- Nutria. Draw down water levels in the impoundments in the spring and summer and flood the impoundments during the fall and winter to minimize nutria habitat.

- American lotus. Draw-down impoundment water level to dry out affected areas and eliminate year-round, stable water depths that are conducive to American lotus. (Currently testing in C-Pool and the North and East Frank Carter/ Colchester impoundments).

- Johnson grass. Apply Round-up (Glyphosate) herbicide to plants by agricultural tractor equipped with spray tank and booms.

- Monitoring invasive plants, such as Vitex rotundifolia, which are present near the Refuge border and which may spread onto the Refuge under suitable conditions.

- Resident Canada goose. Addle impoundment resident Canada geese eggs by shaking, spraying with cooking oil or puncturing to reduce reproduction.

- Selectively control individual resident Canada geese by lethal means (i.e., shooting with small caliber rifle or shotgun) during their April-June breeding season.

Feral Hogs

- State and federal biologists would continue their research of feral hog populations including feasability of trapping.

- Conduct a feral hog hunt to control population levels.

Nutria

- Draw down water levels in the impoundments in the spring and summer and flood the impoundments during the fall and winter to minimize nutria habitat.

Feral Cat

- Control feral cats when they are spotted on the Refuge by lethal means ((i.e., shooting with small caliber rifle or shotgun)or by trapping.

Feral Horses

- Have the Virginia Wild Horse Rescue round-up and remove horses when contacted by Refuge personnel or Sandbridge residents.

- Work with Currituck NWR and FCSP to effectively and cooperatively manage the issue.

Within 2 years of CCP approval:

- Develop an Adaptive Management Framework for phragmites control so that treatments are monitored and evaluated for effectiveness. The refuge will be using an integrated approach to phragmites control, which will consider restoration of natural processes, herbicides, prescribed burning, and other tools as they are developed.

- Develop partnerships with Virginia Department of Environmental Quality and local agencies (e.g., Back Bay Restoration Foundation) to collect water quality data that would result in a scientifically sound water quality database for Back Bay and its tributaries. Data from this database would be used to provide the Refuge with sound baseline data for existing Back Bay water quality standards.

Within 3 years of CCP approval:

- Evaluate and determine existing and historic SAV species and distributions of Back Bay.

- Determine SAV restoration potential and implementation in Back Bay.

- Improve the plant diversity of 250 acres of freshwater wetlands within the western and northern marshes (and adjacent lands) around Back Bay (on or off Refuge), by increasing annual plan (smartweeds, Beggars ticks, wild millets, bacopa, and a variety of bulrushes and sedges) production. Such increased annual plant production would occur through a combination of decreasing phragmites reed density/presence in those areas through aerial applications and subsequently prescribe-burning Refuge marshes in previously described geographic locations.

Within 5 years of CCP approval:

- Convert 30 to 40 acres of old field in Tract 194 (adjacent to Muddy Creek Road) to a shallow, freshwater impoundment for migratory waterfowl and shorebirds.

- Establish an effective and scientifically-sound, interagency water quality monitoring program within the Back Bay watershed to establish sound baseline water quality data, and insure that negative impacts to Back Bay's water quality are detected as soon as possible.

Monitoring Elements

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that

detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the regin, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- Establish a long-term SAV monitoring and management program in Back Bay to document SAV distribution.
- To determine water quality within Refuge impoundments and open water, monitor salinity, dissolved oxygen, turbidity, and pH.
- Conduct aerial monitoring of wintering waterfowl use and abundance in SAV and emergent wetland habitats. Utilize data to document the effectiveness of management activities and adjust management protocols as necessary.
- Insert Vegetation Monitoring Element to make sure the refuge meets objective of >50 stems per acre in 40% of open-water habitats for SAV
- To evaluate quality of wetlands for waterfowl, marshbirds, and shorebirds conduct periodic vegetation surveys for plant species composition, and community structure.

Goal 2:

Enhance and preserve the biological integrity and diversity of native woodlands to support native wildlife and plant communities including species of conservation concern.

Objective 2a. Shrub-Scrub Habitat (Maritime Upland Forest Edges and "Green Hills" Edges)

Within 6 years of CCP approval, provide 90 acres of shrubby, mid-story canopy in woodlands to the north and south of Sandbridge Road, east of Muddy Creek Road and the old field area of Long Island, to benefit declining migratory landbird species(e.g. Prairie warbler, Field sparrow, Brown-headed nuthatch and Eastern wood peewee) and breeding Yellow-crowned night heron. Native shrub species such as waxmyrtle, blueberry, inkberry, gallberry, and yaupon will be planted or encouraged to volunteer where parent plants exist.

Rationale

Shrub-dependent species are another rapidly declining bird group due to loss of habitat. Refuge shrub-scrub habitats are comprised of various shrub species, or a diverse mix of young trees. They provide an abundance of insect food for breeding birds, which need large amounts of protein for reproduction and feeding their young. Many shrub species also bear fruit in the fall, which helps boost the fat reserves for migrating or over-wintering birds. The structural density in this habitat type also provides cover from predators and shelter from harsh weather. Shrubby, early succession patches in close proximity to interior forest breeding territories are also important for survival of fledgling forest birds; these fledglings can feed on the abundant food sources in the dense foliage, in relative safety from predators.

In addition to being transitional in nature, shrub habitats are quickly disappearing because of agricultural practices and increased development pressures. Shrub-dependent birds will be forced to rely more heavily on intentional provisions of this habitat type by land managers.

The Eastern wood pee-wee and Prairie warbler favor early succession forests and shrubby habitats where they can glean insects, especially leaf-eating caterpillars in the treetops and hide their nests in the foliage. The Field sparrow,

a year-round resident of the Refuge, favors old-field/forest edges where woody encroachment, tall forbs, vines and shrubs are well represented in an otherwise open habitat. It builds its nests low to the ground in young saplings or shrubs. That scenario frequently appears in landscapes containing a mosaic mix of field and forest or in regenerating, cut-over areas. The Chuck-will's-widow is also relatively common.

The vegetation structure and food supplies provided by shrub habitats benefit other species such as the Palm and Blackpoll warblers and Willow flycatcher, that use the refuge during migration; together with breeding Yellow-breasted chats, Blue Grosbeaks, Indigo buntings and Gray catbirds. Minimum patch sizes would vary according to habitat quality (vegetation density), landscape and surrounding vegetation.

Impoundments not meeting waterfowl/shorebird management goals or objectives may be permitted to revert to shrub-scrub.

Strategies

Continue to:

- Allow shrub-scrub growth in areas not detrimental to moist soil management or other Refuge objectives (i.e. permitting pond to revert to shrub-scrub).
- Maintain, where possible, shrub-scrub habitats in that state of plant succession by culling larger trees or removing tree tops.
- Revert up to 20 acres of former agricultural field over the next 5 years to shrub-scrub habitat.

Within 2 years of CCP approval:

- Reclaim old fields that have naturally succeeded to an early forest habitat stage, using tree pruners and chain-saws to remove the tops of the taller trees adjacent to Sandbridge and Muddy Creek Roads.
- Prescribe burn these areas if possible to reduce ground litter accumulations and encourage forb and shrub growth.
- Thin tree densities and remove tree tops to prevent succession to a forested community. Tree tops should not exceed 7 feet in height.
- Replace dead shrubs if more than 30% of planted shrubs have died. Volunteers and YCCs can conduct these surveys.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate

a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- To evaluate achievement of the objective for breeding and migrating priority passerine species establish landbird surveys and migration counts.
- Shrub plantings should be surveyed annually (May or June) for 3 years, or until well established.
- To evaluate the effectiveness of prescribed burning conduct post-burn surveys to measure the area, the intensity, and the success of the burn.

Objective 2b. Shrub-Scrub Habitat (Estuarine Fringe Swamp Forest, Maritime Dune Scrub): Songbird Nesting and Migration

Provide a minimum of 500 acres of existing maritime dune shrub-scrub consisting of a mixture of thick shrub (e.g., waxmyrtle, saltbush/high-tide bush, inkberry and cherry) and forbs (e.g., switchgrass, vines, blackberry canes, greenbrier, goldenrods). These habitats provide critical songbird nesting and migrating habitats for the listed priority shrubland species (e.g. Prairie warbler, Field sparrow, Brown-headed nuthatch, Eastern wood-peewee, and Yellow-crowned night heron) along the wooded shorelines of the Back Bay Watershed and the western side of oceanfront dunes.

Rationale

In addition to the Prairie warbler and Field sparrow, the Eastern towhee and Brown thrasher prefer the drier, shrubby habitats typically found along forest and sand dune edges within the barrier island portions of the Refuge. In these areas, the denser and more diverse vegetation offers a variety of fruits, nuts, and insects to many declining passerines. Such habitats, located behind coastal sand dunes, are naturally in shrub cover due to their proximity to the Atlantic Ocean's salt-air, wind-pruning effects that prevents tree or shrub growth above dune-top elevations. Most of these habitats already exist and need only routine, annul visual checks to insure that no significant shrub mortality is occurring.

Strategies

- Protect from mechanical clearing (i.e., root raking) or other forms of removal/ destruction, particularly along western sides of ocean-front dunes.
- Where feasible, control loblolly pine, sweetgum, and red maple saplings where established by removing their tops or cutting down the entire tree.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- To evaluate achievement of the objective for breeding and migrating priority passerine species continue to conduct landbird surveys and migration counts.
- Monitor shrub-scrub communities for the presence of loblolly pine, sweetgum, and red maple saplings.

Objective 2c. Forest Communities (Non-riverine Wet Hardwood, Maritime Swamp Forest, Mixed Wooded Wetlands, Maritime Upland Forest, Upland Mixed Woodland and Nontidal Wetlands-Reforestation Unit)

Enhance, restore and preserve 25% of the existing 1,415 acres of forested communities (forested swamp, mid-successional lowland forest, 2 acre Atlantic white cedar restoration stand, and maritime shrubland/woodlands) using accepted silvicultural practices to thin forest canopy and promote mid-story development to maximize nesting and foraging habitat for migratory songbirds of high conservation concern (e.g., Wood thrush, Veery, Eastern wood-pewee, Field sparrow, Black-throated green warbler, and Prothonotary warbler) and other species of conservation concern. Where possible, close up the tree canopy by either planting former agricultural lands or old fields with locally native tree seedlings (e.g., Black and water tupelo, Bald cypress, Water and Willow oak, and Green ash), or by reforesting through natural succession (e.g., Loblolly pine, Red maple, Wax myrtle, and Sweetgum).

Rationale

Of the total 9,035 acres of Refuge, approximately 1,415 acres are forested. Refuge forest communities are composed of approximately 650 acres of forested swamp, 700 acres of mid-successional lowland forest, and 65 acres of maritime shrubland/woodlands. Following a FWS Biologists' and Foresters' review of all Refuge habitats in the late 1990's, it was recommended that the Refuge thin loblolly pine, sweetgum, and red maple in Refuge forests – particularly around Sandbridge Road, as well as the Green Hills area. Thinning would open up the forest canopy and allow sunlight to reach the forest floor, thereby increasing ground cover, oak germination and mast production. Consequently, a mid-story canopy and additional food resources would be provided that would benefit declining migratory songbird species and resident mammals.

One of the major roles that this Refuge can play in the surrounding Virginia Beach landscape is to provide as much contiguous, non-fragmented native forest habitats as possible. Forest habitats are rapidly disappearing from the surrounding landscape, as urban sprawl continues spreading towards the rural Back Bay watershed of southeastern Virginia Beach. Wildlife habitats and resident wildlife are lost each year, as local woodlands are razed and replaced with large houses on small lots. Providing additional extensive forest habitats in the Back Bay vicinity has become a new priority; since this will also provide a last significant reservoir habitat for declining migratory bird species (e.g., prothonotary warbler, ruby and golden-crowned kinglet) and other resident wildlife that prefer large, non-fragmented forest tracts.

Most refuge forested habitats are not yet mature, and are principally lowland/bottomland types. As a result, their timber values are not very high. However, logging of some areas should occur, in accordance with good forest management practices and recommendations presented below.

Regional biologists theorize that remnant maritime forest along the western side of A-Pool may have formerly been a longleaf pine-pond forest that was clear-cut and drained, and replaced by the existing tree species. Tree thinning of young maples, sweetgums, and loblolly pines, along with prescribed burning, was recommended for this maritime forest remnant.

Tree thinning is also needed to open up the canopy in forests to the north and south of Sandbridge Road. This thinning would encourage natural regeneration of hard mast species such as oak, ash, and tupelo, where the sun can reach the forest floor. A Biological Review Team, suggested the future condition of these forest habitats (north and south of Sandbridge Road) and similar stands, should be towards a more complex canopy structure that favors retention of larger hardwoods and removal of loblolly pine; together with increased forest understory (shrubs) structure and development of large enough canopy openings to encourage successful oak regeneration where oak seedlings now exist.

The barrier island portion of the Refuge, along the western side of A-Pool, includes a young remnant maritime forest. It includes such southern species as live oak and pond pine, together with the usual red maple, sweetgum and loblolly pine. Other lowland forests exist along the western side of Back Bay, in the Nanney Creek, Beggar's Bridge Creek, Muddy Creek and Hell Point Creek vicinities, and along the northern and southern sides of Sandbridge Road. They consist primarily of red maple, bald cypress, sweetgum, black gum/tupelo, white oak, laurel oak, southern magnolia and scattered loblolly pine. Waxmyrtle, high-bush blueberry, and groundsel shrubs are also scattered about the forest floor, together with several ferns, vines, canes and greenbriers. In several older growth locations, very large trees exist that should be protected and preserved. A separate oak, tupelo, green ash and cypress seedling planting effort should occur in thinned areas that lack such parent trees, to restore more desirable bottomland tree species. Volunteers could be encouraged to plant oak and other hardwood seedlings, after the thinning is completed. A higher water table should be maintained in the replanted sites, to support the native tupelos, ash and cypress trees; since they prefer wet soils.

Strategies:

Within 2 years of CCP approval:

- Use EPA-approved herbicides, if necessary, to thin undesirables. This would also support the growth of new tree plantings and related restoration efforts.

- Plant seedlings of mast-producing oaks, tupelos, gums and/or green ash in areas that have had the canopy opened up, and where sunlight to reach the forest floor. Volunteers could be utilized to plant oak and other hardwood seedlings, after the thinning is complete.

- Investigate the feasibility of establishing a tree-cutting and planting "Partners Restoration Project" with Virginia Ecological Services Office..

- Manage for higher water levels by eliminating or plugging man-made drainage ditches to support new trees that prefer a high water table, where adjacent property owners would not be negatively impacted.

- Conduct a fire management program capable of carrying out several prescribed burns each year with the primary purpose of increasing plant diversity in upland and wetland communities, reducing the dominance of phragmites, and reducing fuel loads. Focus efforts on the Green Hills area for fuel reduction and habitat improvement.

Within 3 years of CCP approval:

- Increase the presence of a shrubby, mid-story canopy to benefit migratory songbirds by opening up the upper tree canopy in areas where sunlight cannot

reach the forest floor. This will also support the growth of tree plantings, and related restoration efforts.

- Initiate strategies to provide an additional 30 acres of mixed tupelos/gums, bald cypress, wetland tolerant oaks and green ash in woodlands to the north and south of Sandbridge Road, east of Colchester Road, and with the "Green Hill's" area.

- In the 2-acre Atlantic White Cedar restoration area, remove 90% of competing loblolly pine, sweetgum, red maple trees, waxmyrtle, and groundsel shrubs by annually thinning up to 2 acres of this vegetation in summer. This will be accomplished with chain-saws and hand tools and focus on areas with denser canopies that cause ground shading.

Within 10 years of CCP approval:

- Reduce the number/density of loblolly pine, red maple, and sweetgum trees to approximately 35% of all trees in the Sandbridge Road forest vicinities. Conversely, we would increase the number of tupelos/gums, bald cypress, wetland tolerant oaks and green ash so that they collectively comprise 60% of the tree species in the Sandbridge Road forest vicinities.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Conduct periodic monitoring to determine whether cutting and herbicides applications are necessary to thin undesirable plant species.

- Prevent new invasive species from becoming established within the freshwater impoundments by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- To evaluate achievement of the objective for breeding and migrating priority passerine species continue to conduct landbird surveys and migration counts.

- Where native seedlings are planted, monitor survival/mortality rates to determine whether supplemental plantings are warranted.

- To evaluate the effectiveness of prescribed burning conduct post-burn surveys to measure the area, the intensity, and the success of the burn.

GOAL 3: **Manage beach and dune habitats to preserve and protect migratory birds in addition to other native wildlife and plant communities, including species of conservation concern.**

Objective 3a. Fragile Dune Communities (Maritime Dune Grasslands)

Manage and protect approximately 420 acres of fragile dune communities by maintaining and enforcing the year-round closure to the public. The closure insures that damage incurred by human foot traffic on these dune slopes is minimal to nonexistent, and these fragile ocean buffers remain in as good a

condition as possible. Stable dune communities are characterized by the presence of the following plant communities:

- Sea rocket (Cakile edentula) and American beachgrass (Ammophila breviligulata) along the wrack/debris lines at the toe of the dune slope;
- Bitter seabeach grass (Panicum amarum ssp. amarum)and sea oats (Uniola paniculata) along with a diverse assemblage of low-cover species [e.g., seaside goldenrod (Solidago sempervirens var. sempervirens), sea-beach evening primrose (Oenothera humifusa), and spurges (Chamaesyce bombensis and polygonifolia)] along the crest of primary dunes and gentle back slopes; and,
- Beach panic grass and beachgrass along smaller secondary dunes away from primary dunes and salt spray.

Rationale

The refuge's dune complex consists of a series of several dunes (primary, secondary, tertiary, etc.) that have consistently withstood severe hurricanes and protected the 880 acre, freshwater impoundment complex to the west, from ocean overwash. Major threats to dune communities include development and coastal erosion. Excessive walking and vehicle traffic in dunes results in the loss of stabilizing plants (i.e. American beachgrass and sea oats), which reduces dune stability, accelerates erosion, and increases the chance of breaching during storm events.

Rare plant species are known to exist in Refuge and False Cape State Park dune swales. Some people in the community suspect that Refuge impoundment construction of G, H and J Pools contributed to the loss of some swales. However, Refuge biological staff maintain that construction of G, H and J Pools actually resulted in the creation of additional dune swale habitats, and that many of the plant species that exist therein include some of these rare dune swale species. Research is needed to confirm that the existing three "dune pools" contain many of the same species, and possibly in greater numbers, than the original swales that may have been impacted by the three impoundments' construction. Comparisons between the vegetation of the natural existing dune swales within False Cape State Park can be compared with the plant species within G, H and J Pools to arrive at a satisfactory conclusion. Additional rationale for this objective can be found on page 2-17 (Alternative A, Objective 3a)

Strategies

- Prohibit public entry into dunes unless by Special Use Permit. Allow only compatible uses on the beach.
- Conduct regular law enforcement patrols for visitor and resource protection.
- Replace old "closed area" signs with new and improved signage.
- Minimize motor vehicle use, frequent trespass, heavy equipment activities, and use of military ordinance or other activities that would negatively impact the dunes as determined by the Refuge Manager.
- Repair dune breaches where they occur by placing sand-fencing and/or discarded Christmas trees in the breach. If necessary, use the Refuge front-end loader to replace lost and start the dune rebuilding process.

- Encourage the formation of ocean-front, primary dunes by limiting vehicle access to only Refuge permittees and Back Bay NWR and False Cape SP employees on official business.

- Continue to keep Refuge dune systems closed to the public to avoid related negative impacts (e.g., loss of stabilizing plants, accelerated erosion, vandalism or disturbance to sea turtle nursery area, etc.).

- Eradicate beach vitex where it becomes established using accepted invasive species control methods (e.g., herbicide application).

Within 3 years of CCP approval:

- Coordinate with False Cape State Park to monitor and assess the effects of natural dune succession and natural dune swale plant community changes at both Back Bay NWR and False Cape State Park.

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the dune communities by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.

- *Within 1 year of CCP approval,* establish vegetation line transects in G, H, and J Pools to document plant species composition and changes in plant communities over time.

- *Within 3 years of CCP approval,* work with False Cape State Park to monitor and assess natural dune succession and natural dune swale plant community changes over time. The refuge and False Cape State Park will conduct comparative surveys/transects of three, 3-5 acre False Cape State Park dune swales, and three similar sized patches of wet marsh in G, H, and J Pools. Survey results will be compared to determine plant species composition, relative densities, and frequency of occurrences in both systems.

- To determine the location and extent of dune breaches, assess post-storm damage immediately east of the 880-acre, ten impoundment complex within 24 hours of a significant storm event.

Objective 3b. Upper Beach and Overwash Flats: Loggerhead and Green Turtles

Protect, through seasonal closures and prohibiting vehicular access, 4.2 miles of high beach habitat (approximately 200 acres) for federally threatened loggerhead and Green sea turtles to prevent disturbance during nesting (success rates of >90%), and to ensure successful emergence and movement of young into the Ocean. Work with partners to evaluate and reassess sea turtle nest managment practices in light of the January 2009 revised loggerhead sea turtle recovery plan, and continue nest relocations or other management and protection of nesting areas to reduce nest loss from storm or high tide overwashes, predators

or, other causes. Continue to allow coastal processes of wind and wave action to shape upper beach and overwash flats habitats.

Rationale

Refuge purposes include managing habitats for the continued support of threatened and endangered species. On the refuge, current management includes the protection of 4.2 miles of high beach (approximately 200 acres) that provides nesting habitat for federally threatened loggerhead and green sea turtles and ensures successful emergence and movement of young into the ocean. It is important to ensure that the local population of nesting Loggerhead sea turtles continues to have access to the refuge's undisturbed beach areas. Disturbances to the sandy beach surfaces, such as increased tire ruts, pose obstacles to sea turtle hatchlings during their run to the ocean from local nests.

It is theorized that our nesting sea turtle population, which at the northern extent of its breeding range, may contribute significantly to the male gender of the Atlantic's Loggerhead sea turtle population. Sea turtle gender is determined by ground temperature (Forbes 1992), where warm temperatures (>29° C) produce more females and cooler temperatures (<29° C) produce more males.

Strategies:

Continue to:

- From June 1st through August 31st, patrol ocean front beaches by all-terrain vehicles (ATV) from the southern boundary of Dam Neck Naval Base, south through Sandbridge, the Refuge, and False Cape State Park to the North Carolina border for signs of nesting sea turtles and for stranded turtles and marine mammals. Photo-document, collect tissue samples and record various measurements of stranded sea turtles in cooperation wiht the Virginia Marine Science Museum Stranding Team.

- Relocate sea turtle nests from ocean-front beaches of the community of Sandbridge, the Refuge and False Cape SP anc conduct other appropriate nest protection and management activities as determined through re-evaluation of sea turtle nest management practices. Any sea turtle nest relocations would follow the most current Refuge protocol, developed in conjuction with Refuge partners.

- Monitor sea turtle nests day and night, when eggs are close (7 to 10 days) to hatching date. Immediately transport hatchlings to the beach from relocated nest sites.

In addition:

- Work with USFWS Ecological Services, VDGIF, and other partners to evaluate and reassess sea turtle nest management on the Refuge and develop and implement any revised nest management practices that are appropriate and consistent with loggerhead sea turtle and green sea turtle recovery plans.

- Transport sea turtle hatchlings to the beach from relocated nest sites.

- Prohibit public entry into dunes unless by Special Use Permit.

- Continue prohibition on permittee use of the Refuge beach from 11pm – 5am during sea turtle nesting season to limit human disturbance

- Continue to prohibit vehicular access and other strictly recreational activities (e.g., swimming, surfing, sunbathing, picnicking, etc.).
- Ensure that the local sea turtle population has access to available nesting habitat along the 4.2 miles of Refuge high beach.
- Eradicate beach vitex where it becomes established using accepted invasive species control methods (e.g., herbicide application).

Monitoring Elements

Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success with respect to our objectives. The results may trigger adjustments to management strategies, or a reevaluation or a refinement of our objectives. Examples of monitoring or surveys that we may implement include:

- Prevent new invasive species from becoming established within the dune communities by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.
- Conduct daily sea turtle patrols to locate sea turtle crawls, nests and strandings at sunrise from late May through late August. Patrol areas, in the summer, using All-Terrain Vehicles (ATV) from the southern boundary of Dam Neck Naval Base, south through Sandbridge, the Refuge, and FCSP to the North Carolina border for sings of nesting sea turtles and for stranded turtles and marine mammals.
- Monitor sea turtle nests when eggs are close to hatching (7-10 days from expected hatch date) to evaluate hatch success and to support appropriate management of nest sites during hatching.
- Regue biological staff willphoto-document, collect tissue samples and record various measurements of stranded sea turtles; in keeping with Virginia Aquarium protocols. Data is forwarded to the Aquarium Stranding Center for inclusion in their annual Stranding Report.

Objective 3c. Upper Beach and Overwash Flats: Shorebirds and other species of high conservation concern

Continue to allow coastal processes of wind and wave action to shape approximately 200 acres of the upper beach and overwash flats community that benefit migrating shorebirds (e.g. Piping plover, Red knot, American oystercatcher, Whimbrel, Sanderling, and Semipalmated plover), tiger beetle species, seabeach amaranth, and other species of high conservation concern.

Rationale

Refuge beaches provide roosting and foraging areas for shorebirds during their spring and fall migrations. Increased vehicle traffic along Refuge beaches would reduce feeding activity and physically harass the large numbers of migrating shorebirds that use the refuge and False Cape State Park beaches during April-early June and August-September. Physical harassment resulting increased flight activity has been shown to negatively impact the condition and well-being

of migrating birds by increasing caloric expenditures, thereby reducing the amount of stored body fat required to survive their seasonal migrations. Reduced body fat may result in increased mortality rates during the arduous migrations that migratory birds undertake twice a year.

In addition, the North Mile high beach contains the best potential nesting habitat on Back Bay NWR for federally threatened piping plovers. While nesting occurrences for piping plovers have not been documented, suitable habitat does exist within the North Mile Beach. The refuge will use seasonal beach closures to limit disturbance to potentially nesting shorebirds.

Strategies

Continue to:

- Limit disturbance from vehicular and human traffic through seasonal beach closures.
- Maintain year-round closure of North Mile Beach to the public, in order to provide: potential nesting habitat for piping plovers, undisturbed roosting foraging habitats for shorebirds and waterbirds during their spring (late-April – end of May) and fall (mid-August – late September) migrations, and a buffer from the Little Island City Park public beach.
- Continue to phase out Refuge MVA use to minimize associated negative impacts to ocean-front beaches and related shorebird use during the spring and fall migration.
- Eradicate beach vitex where it becomes established using accepted invasive species control methods (e.g., herbicide application).

Monitoring Elements

- Prevent new invasive species from becoming established within the dune communities by utilizing Early Detection Rapid Response Techniques that detect newly established invasive species and immediately addresses those populations through the appropriate control measure. This will incorporate a combination of plant identification and inventories, maintaining updates of new invasive species present in the region, as well as having knowledge of the appropriate management techniques prior to conducting control efforts.
- When two or more piping plover sightings occur within the same area during routine shorebird beach surveys, conduct surveys to detect presence of nesting piping plovers during the breeding season.
- Monitor shorebird use throughout the year to detect species and beach use. Collect and share survey data with partners and interested agencies.

GOAL 4. **Provide natural environment for native fish, wildlife, and plant populations (with special consideration to those species whose survival is in jeopardy).**

Objective 4a. Threatened and Endangered Species

Continue current management practices (protection, monitoring, nest protection, ensuring high hatch and release rates, and habitat closures) of Federal and State threatened or endangered species, including the loggerhead sea turtle, piping plover, bald eagle, and eastern glass lizard.

Rationale for Objective

In keeping with the Endangered Species Act, Federal recovery plans for the above species, and Back Bay Refuge purposes and goals, the Refuge is responsible for ensuring that existing populations of endangered, threatened and rare species (whether Federal or State) are protected, and their populations encouraged to increase. The above practices have caused very high production rates (usually >90%) in sea turtle nests, and increased use of Back Bay by nesting bald eagles during the past 15 years. Refuge biological staff work with State non-game biologists to determine the extent of the Refuge glass lizard population.

Refuge habitats are used by several Federal and/or State-listed threatened or endangered species. These include: the State threatened Eastern slender glass lizard, State endangered Eastern big-eared bat, State threatened bald eagle, Federally threatened loggerhead sea turtle, and the Federally threatened piping plover. The bald eagle was de-listed in June 2007; however, protective actions are still required under other laws and regulations in order to maintain current population levels and prevent another decline. In addition, several State rare species are found throughout the Refuge, including the king rail, least bittern and the plant Liliaeopsis carolinensis. We would continue current management of the Refuge in order to protect and conserve these species. In addition, we specifically plan to maintain a nest success rate of 90% or higher for all Refuge sea turtle nests on Sandbridge, Refuge and False Cape State Park ocean-front beaches. Refuge biological staff have carefully studied differences between relocated sea turtle nests, and those left in place ('in situ') during 2003-2005. In addition, Refuge biologists have developed an extensive and detailed protocol for nest relocations during the past 15 years. Using Refuge protocols, nearly all viable, relocated turtle nests have experienced much higher hatching and emergence rates than those left "in situ."

Strategies

Continue to:

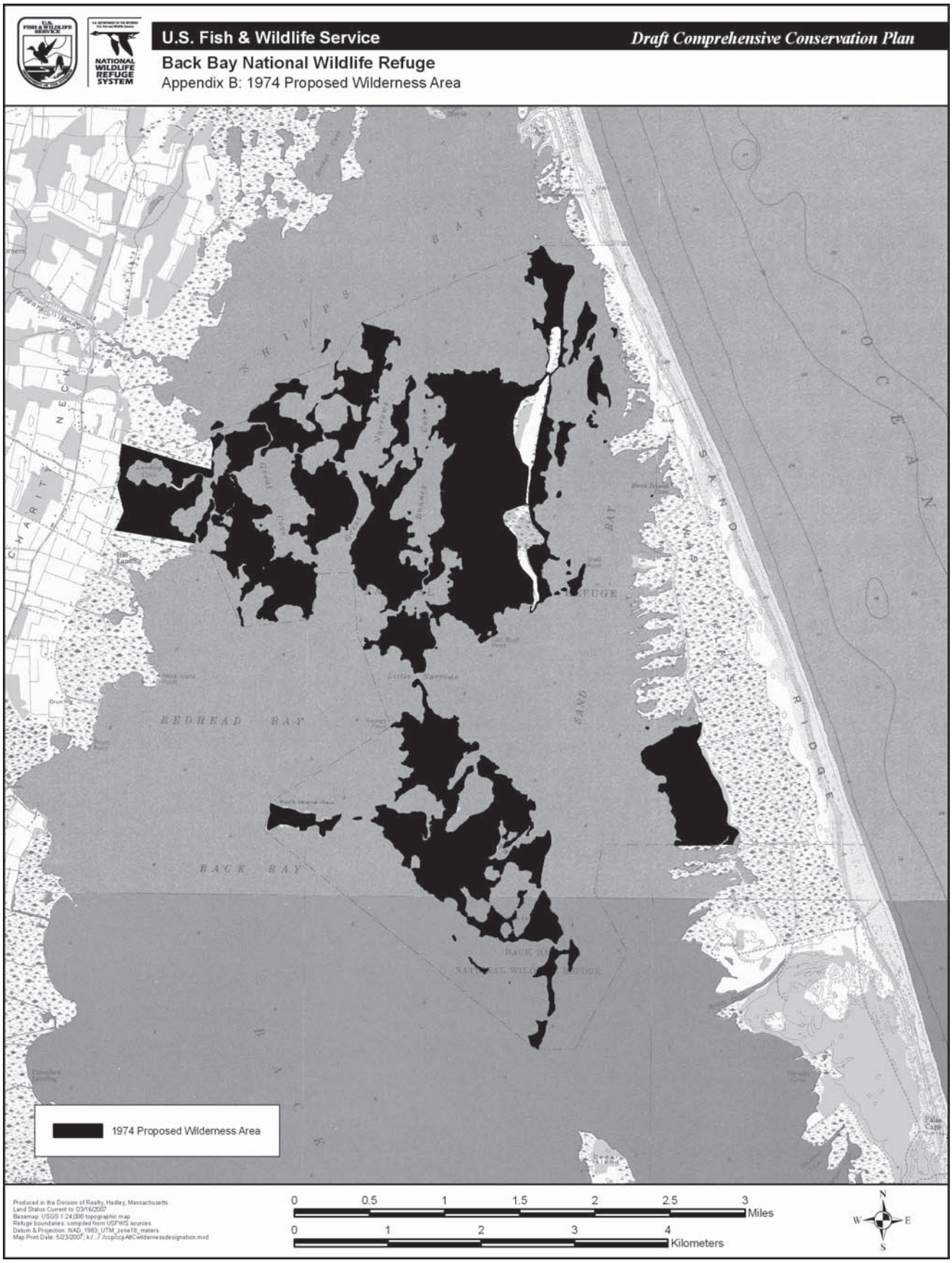
- From June 1st through August 31st, patrol ocean front beaches by all-terrain vehicles (ATV) from the southern boundary of Dam Neck Naval Base, south through Sandbridge, the Refuge, and False Cape State Park to the North Carolina border for signs of nesting sea turtles and for stranded turtles and marine mammals. Photo-document, collect tissue samples and record various measurements of stranded sea turtles in cooperation with the Virginia Marine Science Museum Stranding Team.

- Relocate all sea turtle nests from ocean-front beaches of the community of Sandbridge, the Refuge and False Cape SP. Sea turtle nests would be relocated, using the most current Refuge protocol, to one sea turtle nursery behind the primary sand dune and immediately west of the high beach, on the Refuge.

- Monitor sea turtle nests day and night, when eggs are close (7 to 10 days) to hatching date. Immediately transport the hatchlings to the beach from relocated nest sites.

- Conduct periodic surveys (approximately once every 3 years) for the glass lizard in cooperation with the State Nongame/Endangered Species Biologist to determine presence or absence.

- Twice a year, monitor the active bald eagle nest in the North Bay marshes vicinity and any new ones located on the Refuge and protect area around nests from disturbance. Monitoring shall provide a reliable productivity estimate.


U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Appendix B: 1974 Proposed Wilderness Area
SHIPPS BAY
CHARITY NECK
REDHEAD BAY
BACK BAY
SAND BAY
SAND RIDGE
OCEAN
1974 Proposed Wilderness Area
Produced in the Division of Realty, Hadley, Massachusetts
Land Status Current to: 03/16/2007
Basemap: USGS 1:24,000 topographic map
Refuge boundaries: compiled from USFWS sources
Datum & Projection: NAD_1983_UTM_zone18_meters
Map Print Date: 5/23/2007, k:/.../ccp/ccpAltCwildernessdesignation.mxd
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0 1 2 3 4 Kilometers
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Objective 4b. Wilderness

Rescind existing proposal to designate proposed Refuge Wilderness Survey Area (2,165 acres) as Wilderness (Map 4-1).

Rationale for Objective

The conditions within and surrounding the Refuge's WSAs have changed considerably since their original designation proposal in 1974. The population of Virginia Beach has increased by more than 250% since 1970, from 172,000 then to approximately 440,000 today. The proliferation of boats and personal motorized watercraft (i.e. jet skis) on waters surrounding the marsh islands has resulted in negative impact related to "sights and sounds" as compared to 30-plus years ago.

Non-native invasive plants within the WSAs, such as common reed (Phragmites species), are also more dominant and require intensive management to maintain biological integrity and environmental health. In addition, due to island erosion and the intensive management efforts needed to control encroachment of invasive species, the island assemblage is affected by man's work rather than the forces of nature. This work is noticeable throughout the year. Furthermore, although the island assemblage can provide limited opportunities for primitive recreation, and even solitude in the winter months, there are no *outstanding* opportunities for such throughout the year. The Green Hills and Landing Cove WSA units provide limited opportunity for primitive recreation opportunities, and do not meet wilderness size criteria.

Although the area no longer meets the minimum criteria for wilderness designation, the Service recognizes the importance of preserving plant and animal communities in a natural state for research purposes. Thus, the Service will identify, classify and establish the previously proposed areas as a Research Natural Area (RNA). Activities would be limited to research, study, observation, monitoring and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions as outlined in Service policy for RNAs. Service RNA policy also states:

- RNAs must be reasonably protected from any influence that could alter or disrupt the characteristic phenomena for which the area was established.
- The refuge manager may initiate management practices only where necessary to preserve vegetation and only as stated in a plan approved by the regional director. These management practices may include grazing, control of excessive animal populations, prescribed burning, and the use of chemicals for plant, insect and disease control.

Strategies:

- Maintain and manage all 2,165 acres of proposed wilderness that was designated under the 1974 EIS using "minimum tool." The minimum tool concept is defined in the glossary.
- Management would include continued invasive plant control, periodic bird surveys, and the annual October deer hunt program.

Within 2 years of CCP approval:

- Work with interest groups, partners (i.e., The Wilderness Society, Virginia Department of Game and Inland Fisheries) and appropriate government officials to rescind the proposal to designate the proposed WSAs as Wilderness.

- Initiate the formal process to remove all proposed WSAs from consideration as Wilderness. Complete procedures to designate appropriate areas as Research Natural Areas (RNA). Document in an approved Natural Area Information Form, and submit to Regional and Washington offices sequentially for approval.

Objective 4c. Cooperative Farming

Within 5 years of CCP approval, implement strategies for managing the existing farmland to benefit migratory birds during the fall migration and possibly winter.

Rationale for Objective
Cooperative farming has been permitted to occur on newly acquired lands that were farmed prior to acquisition since the early 1990s. Farming supports the local economy while maintaining the disturbed status of the land, in the event that a better use for it is determined. Agricultural farming is prevalent in the surrounding community. Only corn and soybeans are grown on these lands (since they also provide a wildlife food value), and only approved pesticides and herbicides are permitted. Genetically modified crops are not permitted.

However, possible conflicts with the Service's Biological Integrity policy may force terminating the Cooperative Farming Program. The policy specifies that farming on refuges must provide direct, primary wildlife benefits to specific wildlife populations for which the refuge was established. Secondary benefits alone do not constitute justification for continuation of farming on a national wildlife refuge.

Strategies:

Continue to:

- Allow farmers to provide direct payment for participating in the cooperative farming program.

- Allow farmers to use pesticides only after pesticide use proposals are approved by the Regional Office.

Within 2 years of CCP approval:

- Explore the possibility of the farmers contributing a portion of their crop to migratory birds in the fall, in lieu of rental payments. If it is determined that this would provide a more beneficial habitat for migratory birds than native vegetation, this contribution could take the form of several acres of grain being knocked down or otherwise being used to benefit migratory birds.

To provide time for adequate planning and evaluation, within 5 years of CCP approval:

- Phase out cooperative farming as a Refuge program, in keeping with the Service's Biological Integrity policy.

- The Refuge will develop a phase-out plan including strategies to reforest/ restore the parcels to wildlife habitats with native tree and shrub species.

- Notify farmers of the timeline, and request existing farmers to voluntarily withdraw within the timeline.

- Where restoration plans can be implemented, and farmers have not voluntarily withdrawn, no new cooperative farming agreements will be issued.

Within 10 years of CCP approval:

- Convert former agricultural areas to forest and/or shrub-scrub habitats.

Objective 4d. Submerged Aquatic Vegetation Management

Restoration work pertaining to SAV can be found under Objective 1e.

Within five years of approval of this CCP, we will increase (to four) the number of multi-agency partnerships aimed at providing additional reliable water quality, vegetation, wildlife use, and habitat management data, together with other environmental conditions of Back Bay.

Rationale for Objective

Refuge staff do not often possess the necessary skills and time to conduct landscape level work outside the Refuge. State, City, private and other Federal agencies exist that do, together with local citizens. Because of mutual interests in the same natural resources, new partnerships need to be forged, that provide mutual benefits to all partners, pool funding, and shortstop potential problems before they become problems. These partnerships should also present possible solutions to current and future habitat degradation issues that affect us all. Such important field data and information may help prevent future isolations of wildlife populations, and their gene pools, in addition to providing evidence that habitat restoration efforts are in fact working (i.e., targeted migratory bird species are now using these newly restored areas). The Refuge alone cannot hope to accomplish the necessary major improvements, on the landscape and/or ecosystem level, that would truly make a difference to Refuge natural resources; however, specialized teams or partners can.

Wind tidal influences are present in the Back Bay Watershed and often pose a negative hydrological influence on existing plant and animal communities (such as SAV), and local agriculture. A lunar tide does not exist. Typically these wind tides flood adjacent wetland areas during the growing season when winds are predominantly from the south; and maintain low water levels during winter when winds are predominantly from the north. Normal surface water hydrology operates oppositely; with low levels during summer (that encourages germination and reproduction of native plant communities and related organisms) and high levels during winter (that buffers the substrate and organisms within from freezing and other cold weather impacts).

The areas of open-water/pothole habitats, that include Ragged Island and southern Long Island, are areas that had previously supported higher aquatic biodiversity up until 2001. Thus, they should have the highest potential for recovery to previous levels, if provided with the necessary protection and time to recover from past frequent disturbances to the water column. Such disturbances in the past have included frequent boat traffic, net-fishing, and recreational personal watercraft activities. A lack of disturbance to the water column should provide time for turbidity to settle out of the water column in these protected, sheltered coves and potholes, where wave action is reduced to a minimum. Decreased turbidity would permit sunlight to reach the substrate and encourage germination of the existing SAV seed-bank. That seed-bank should still be viable. Once SAV germination occurs, the biodiversity associated with it (i.e., fish, shellfish, invertebrates, amphibians, waterfowl, etc) should also return. The return of biodiversity below the water's surfaces of Back Bay hinges on the return of SAVs, and the elimination of as many negative impacts as possible that detract from that goal.

The US Army Corps of Engineers is the Federal agency responsible for maintenance and protection of the nation's waterways; therefore, the Refuge and FWS must partner with them in order to initiate and implement such changes.

Strategies:

Continue to:

- Cooperative efforts with partners in North Carolina through participation in the Service's Carolina Virginia Strategic Habitat Conservation Team and the rest of the Albemarle-Pamlico Estuarine System (APES). This effort would include mapping existing SAV beds throughout APES, compiling historical SAV distribution reference materials, and establishing restoration and improved SAV management guidelines.

- Actively work with the U.S. Army Corps of Engineers in the Currituck Sound Feasibility Study, particularly in respect to their Hydrodynamics/Water Quality Modeling Work Group and the Fisheries, Shellfish, Submerged Aquatic Vegetation and Waterfowl Work Group.

- Explore new partnerships (Virginia Institute of Marine Science) to help understand and improve SAV in Back Bay.

- Refer to Objective 1e. p. 4-8 for additional strategies.

In addition:

- Pending results of the North Carolina-FWS "SAV Study," determine the best SAV restoration technique(s); and implement those SAV restoration techniques on the best available Refuge sites in the Back Bay watershed.

- Create new habitat improvement partnerships where possible, and work with State, Federal, and university partners in new, as well as current, cooperative research programs aimed at improving Refuge and Back Bay habitats and wildlife resources.

- Work with partners (State, universities, interns, bird-watching groups, and/or volunteers) to study Refuge use by neotropical migrant birds, particularly in wetlands and forest restoration areas. (i.e., "*Are rare bird species appearing that prefer large forest tracts, and were not present previously?*")

- Ensure that Refuge wetlands and open-water/pothole habitats remain protected from public disturbances. These areas include Ragged Island and southern Long Island, which have historically supported the greatest waterbird use. Through working with the US Army Corps of Engineers (USACE), initiate personal watercraft use controls in the sensitive, high waterbird-use areas of Ragged and Long Islands. Establish the necessary cooperative regulations to ensure effective public use management during this transition, and develop enforcement capabilities involving possible partnerships with the Virginia Marine Resources Commission, US Coast Guard, Virginia Department of Game & Inland Fisheries, etc., to insure that violations of USACE policies and regulations are not ignored.

GOAL 5.

- Eliminate the Back Bay wind tide influences in restoration sites within the upper reaches of the Back Bay watershed, by installing ditch-plugs or water control structures in connecting, man-made ditches.

Provide additional viewing opportunities of migratory birds and other wildlife to

increase the general public's appreciation and support of natural resources.

The National Wildlife Refuge System Improvement Act of 1997 recognizes wildlife photography and observation, environmental education and interpretation, and hunting and fishing as the six priority public uses of the Refuge System. This means that when considering goals and objectives, priority public uses receive enhanced consideration over non-priority uses. Refuges provide outstanding opportunities to observe and appreciate wildlife in its natural environment. Refuges also provide quality opportunities to engage in wildlife-dependent recreation and foster an appreciation for wildlife and habitat as a participant in the natural environment.

Objective 5a. Wildlife Observation and Photography

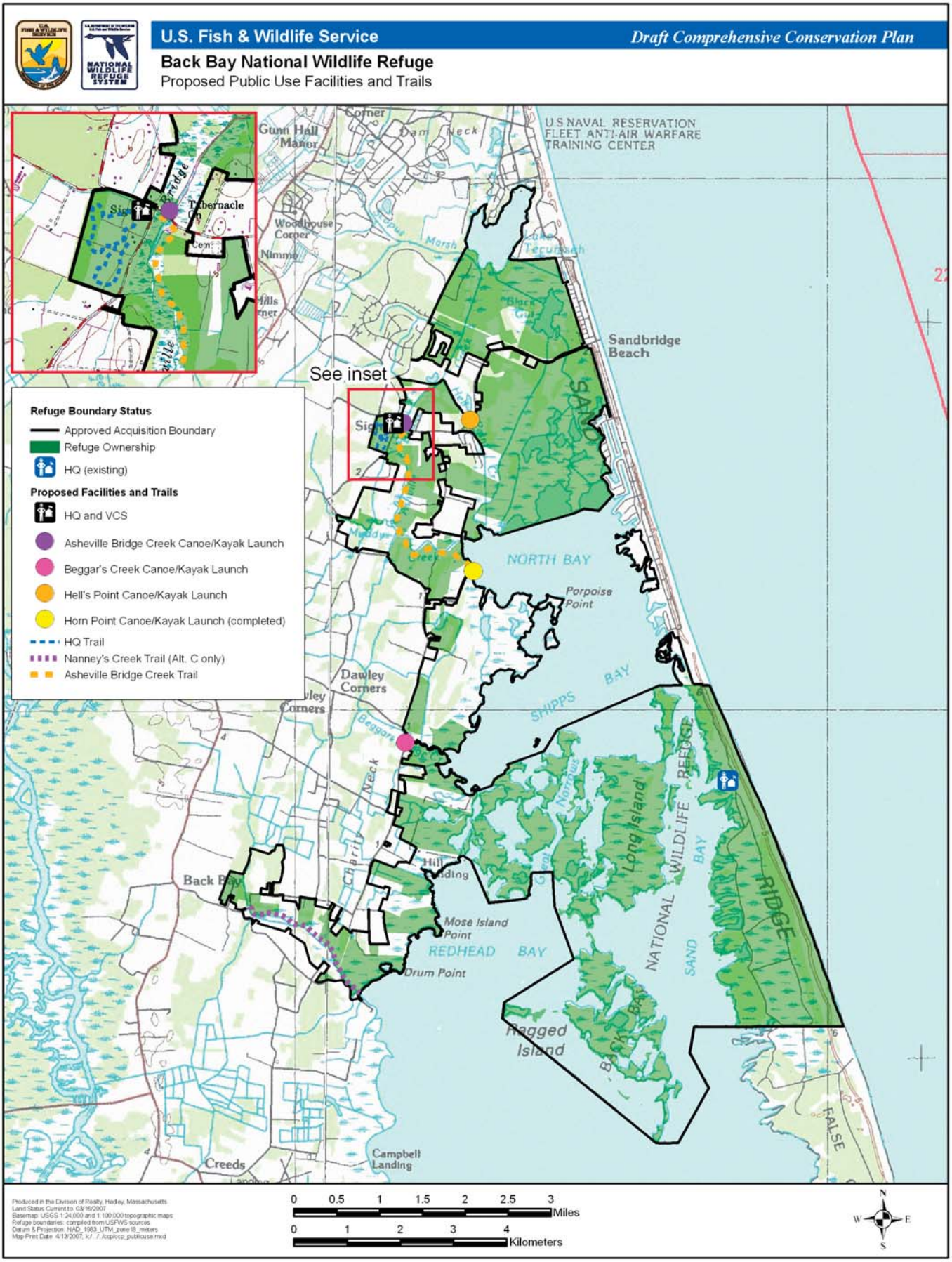
Within 5-7 years of CCP approval, ensure that wildlife observation and photography opportunities meet the needs of 90% of participants.

Rationale for objective
In order to enhance opportunities for wildlife observation and photography, we must improve and expand public access facilities on the Refuge to meet the needs of 90% of the participants. Many of the strategies for wildlife observation and photography are also applicable to the other priority public uses such as environmental education and interpretation. Enhancing these opportunities can increase visitation, thereby expanding public support and understanding of Back Bay NWR and the Refuge System.

This action would expand viewing and photography opportunities on the Refuge beyond what is currently occurring. We will develop a canoe/kayak trail between four launch sites on Asheville Bridge Creek, Hell's Point Creek, Beggars Bridge Creek (Lovitt's Landing), and Horn Point. As discussed in Alternative A of the draft CCP, we currently have a launch site at Horn Point. Under this action, we will develop the other three access points. At all sites, we will develop a low-impact canoe/kayak launch ramp, an 8 to 12 car parking lot, and a restroom. Under this management action, we will also implement a fee collection program at Horn Point for all commercial canoe/kayak launching. Commercial operators could purchase various passes, depending on the number of trips per season, as follows: $20 per trip, up to 4 trips; $100 per season for 5 to 10 trips; $200 for 11 to 20 trips; and, $300 for 21 or more trips. Outfitters must schedule trips in advance.

We will develop a 2-mile hiking trail beginning at the proposed HQ/VCS site (Tract 244 on Sandbridge Road) and ending at Horn Point. Two footbridges will be constructed along the trail: one going over Asheville Bridge Creek at the ABCEEC, and another going over Muddy Creek. Interpretative signs would be placed strategically throughout the trail. The development of the trail will be completed in different phases. We will first work to develop each site (i.e. Asheville Bridge Creek and Horn Point), and then work on constructing the footbridges and connecting the trail with boardwalk. We plan to fully complete the trail, with footbridges, boardwalk, and signs within 15 years of this plans approval (Map 4-2).

Bicycling and hiking on the Refuge has increased in recent years, likely due to local development and increased awareness of the public opportunities at FCSP (access through the Refuge by hiking or biking only). In order to provide a safe and quality experience for all Refuge users, we will relocate and construct a new fee booth, to be aligned with Sandpiper Road. Once the entrance is moved, we will develop a new maximum 20-car parking lot to accommodate parking for hikers and bikers. The existing entrance road will be restriped to accommodate vehicles, bicycles, and pedestrians providing a safer route.


U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Proposed Public Use Facilities and Trails
See inset
Refuge Boundary Status
Approved Acquisition Boundary
Refuge Ownership
HQ (existing)
Proposed Facilities and Trails
HQ and VCS
Asheville Bridge Creek Canoe/Kayak Launch
Beggar's Creek Canoe/Kayak Launch
Hell's Point Canoe/Kayak Launch
Horn Point Canoe/Kayak Launch (completed)
HQ Trail
Nanney's Creek Trail (Alt. C only)
Asheville Bridge Creek Trail
U.S. NAVAL RESERVATION
FLEET ANTI-AIR WARFARE
TRAINING CENTER
Sandbridge Beach
NORTH BAY
Porpoise Point
SHIPPS BAY
Dawley Corners
Back Bay
Mose Island Point
REDHEAD BAY
Drum Point
Hagged Island
NATIONAL WILDLIFE REFUGE
Long Island
RIDGE
SAND
FALSE
Creeds
Campbell Landing
Gunn Hall Manor
Woodhouse Corner
Nimmo
Tabernacle
Produced in the Division of Realty, Hadley, Massachusetts
Land Status Current to: 03/16/2007
Basemap: USGS 1:24,000 and 1:100,000 topographic maps
Refuge boundaries: compiled from USFWS sources
Datum & Projection: NAD_1983_UTM_zone18_meters
Map Print Date: 4/13/2007, k:/.../ccp/ccp_publicuse.mxd
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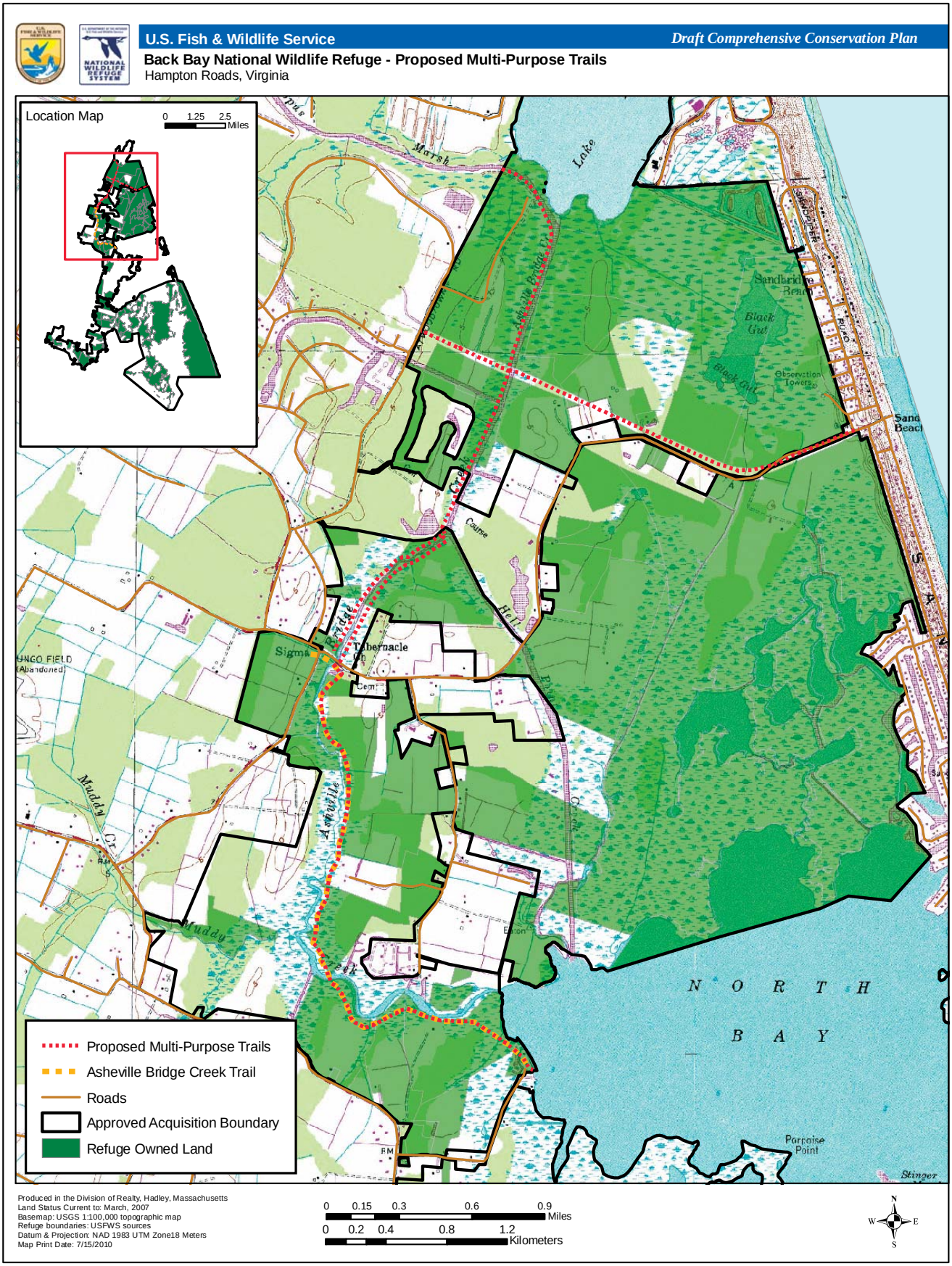
U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge - Proposed Multi-Purpose Trails
Hampton Roads, Virginia
Location Map
0 1.25 2.5 Miles
Proposed Multi-Purpose Trails
Asheville Bridge Creek Trail
Roads
Approved Acquisition Boundary
Refuge Owned Land
N O R T H
B A Y
Tabernacle
Sandbridge Beach
Black Gut
Observation Tower
Porpoise Point
Stinger
Produced in the Division of Realty, Hadley, Massachusetts
Land Status Current to: March, 2007
Basemap: USGS 1:100,000 topographic map
Refuge boundaries: USFWS sources
Datum & Projection: NAD 1983 UTM Zone18 Meters
Map Print Date: 7/15/2010
0 0.15 0.3 0.6 0.9 Miles
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Strategies:

Continue to:

- Complete the construction of the canoe/kayak launching facility at Horn Point.
- Utilize existing trams and programs. Currently, tram tours are conducted in cooperation with Back Bay Restoration Foundation (BBRF).
- Maintain the VCS, the ABCEEC, entrance booth, 50-car parking lot, other structures and buildings, interpretive and directional signs, informational kiosks, benches, trams, vehicles, and trails.
- Develop additional public access facilities. The Refuge is part of the new Virginia Coastal Birding Trail and is a viewing location along the multi-refuge Charles Kuralt Trail.
- Provide opportunities for photography and wildlife observation at the wildlife observation building (northeastern portion of C pool).

Within 1 year of CCP approval:

- Implement fee collection program at Horn Point for commercial canoe/kayak launching.

Within 5-7 years of CCP approval:

- Develop canoe/kayak trail between Asheville Bridge Creek, Hell's Point Creek, Beggars Bridge Creek (Lovitt's Landing), and Horn Point.
- Construct kiosks in conjunction with newly proposed trail heads and canoe/kayak launch sites.
- Construct handicap accessible trail on Tract #244, in conjunction with new HQ/VCS, after remaining land is reforested.
- Provide 8 to 12 car parking lot, a low impact canoe/kayak launch ramp and a restroom at Asheville Bridge Creek, Hell's Point Creek, and Beggars Creek sites throughout the canoe/kayaking and hiking trails
- Utilize trams for transportation to wildlife viewing facility.
- Move and construct new fee booth and restripe existing road to accommodate bicyclists and pedestrians.
- Develop a new 20-car parking lot behind the new fee booth (south of the hammerhead) for hikers/bikers.

Objective 5b. Environmental Education and Interpretation

Within 5-7 years of CCP approval, improve environmental education and interpretation opportunities on the Refuge such that 90% of participants would be able to identify one purpose of the Refuge and one species we manage on the Refuge.

Rationale for Objective

Similar to wildlife observation and photography, environmental education and interpretation programs can dramatically increase public awareness for the Refuge System because these activities can be scheduled with a syllabus to reach target audiences such as, school groups, conservation organizations, community groups, etc. In addition, interpretive panels and displays can help communicate the agency mission to all Refuge visitors.

Under this management action, we will expand the number of fishing events that we have each year. We will have a total of two fishing education events per year. The second event, to be hosted in the spring, would be coordinated and co-hosted with VDGIF. This event will be more like a workshop, with a registration fee, and include education on aquatic ecology, fish biology, angling techniques and non-native species. Also, the event would allow attendees to fish and compete for prizes (i.e. fishing derby). In addition, we will initiate a youth hunt for white-tail deer and feral hogs (See Objective 6a) and additional waterfowl hunting on the Refuge (See Objective 6b).

The construction of the new wildlife viewing facility (refer to rationale under objective 5a) would also provide opportunities for environmental education and interpretation. We will maintain four interpretative signs along the proposed hiking trail (refer to rationale under objective 5a) that would provide education and interpretation along this self-guided trail.

We will develop of a new facility to include refuge headquarters, VCS, and an Environmental Education Center (EEC)(Map 2-3). Construction would follow Regional design standards for a medium facility (see Goal 7 for additional details of the facility). Once this new facility is built it would become the primary environmental education facility. The ABCEEC would become an office and maintenance facility. Many of the strategies for wildlife observation and photography are also applicable to the other priority public uses of environmental education and interpretation, and vice versa.

Strategies:

Continue to:

- Provide on- and off-site, as well as web site environmental education programs for area schoolchildren.

- Provide exhibits in the Visitor Contact Station (VCS) to communicate the history of the Refuge, cultural influences in the area (fishing & watermen, hunt clubs, decoy carving, etc.) and natural resource themes.

- Keep Asheville Bridge Creek Environmental Education Center (ABCEEC) available for use by schools and groups. The facility also houses the Refuge's museum collection, and provides office space for the Refuge's support group, the Back Bay Restoration Foundation (BBRF).

- Provide natural history interpretation in the VCS, through self-guided interpretive displays along trails, audiovisual programs, Service and Refuge-specific publications, guided walks, talks and field demonstrations, and through guided tram tours and special events.

- Maintain the Refuge's Bay Trail, adjacent to the headquarters, which includes a pond activity pier, outdoor classroom site, and interpretive kiosks.

- Provide opportunities for environmental education and interpretation at the wildlife observation building (northeastern portion of C pool).
- Work independently and with partners to provide teacher workshops.

Within 1 year of CCP approval:

- Expand fishing education events at the Refuge to 2 events per year.

Within 5-7 years of CCP approval:

- Develop four interpretive signs that would be placed strategically throughout the hiking trail from the proposed headquarter site to Horn Point.
- Increase on- and off-site environmental education programs and teachers workshops by 20%.

Within 7-10 years of CCP approval:

- Develop and design a new headquarters, VCS, and EEC.
- Once the new headquarters facility is built, use the ABCEEC building as an office and facility for maintenance.

Objective 5c. Non-wildlife dependent uses

Within 5-7 years of CCP approval, improve the quality of non-wildlife dependent recreation facilities to meet the needs of 90% of participants.

Rationale of objective
We will prohibit dog-walking on the Refuge. Since the Refuge mission consists of providing habitats for wintering and migrating birds that include waterfowl, shorebirds, wading birds, marshbirds and landbirds, minimizing those uses that provide the greatest potential conflicts and disturbances to those migratory bird species is a priority. Dogs have been shown by recent research to displace native migratory bird species from the natural habitats that Back Bay NWR was established to provide.

Under this alternative, the Refuge will also work with City and State partners for scenic byway opportunities. This will include a biking trail head once our new headquarter and VCS facility is completed. This will allow the existing biking community a place to connect to the Refuge for enhanced understanding and appreciation of the adjacent, road-side habitats they observe on existing bike routes.

Strategies:

Canoeing and Kayaking

Continue to:
- Provide a car top canoe/kayak launch site at the Refuge headquarter area and at the Horn Point Public Access Site.
- Work with the City of Virginia Beach to develop additional launch sites on Refuge property.

Hiking and Bicycling

Continue to:

- Allow hiking and bicycling along the Refuge dike roads during April through October and year-round along the Refuge beachfront (except the "North Mile"), the entrance road, and the headquarters trails.

Horseback Riding

Continue to:

- Prohibit horseback riding on the Refuge. Horseback riding is not considered to be an appropriate public use (refer to Appendix A for the finding of appropriateness for horseback riding).

Dog Walking

Continue to:

- Annually permit leashed dogs on the Refuge, from October through March (excluding the annual hunt in October).

Within 1 year of CCP approval:

- Within 6 months of CCP approval, dog-walking will no longer be permitted in any Refuge locations. (refer to rationale of objective above)

GOAL 6. **Provide and expand hunting and fishing opportunities to the public where compatible with Refuge purposes.**

Objective 6a. Deer (and Feral Hog) Hunting

Within 3 years of CCP approval, expand high-quality deer hunting opportunities to meet the needs of 90% of participants.

Rationale for Objective

Under this management action, we will fully analyze the potential of expanding additional deer hunting in new areas through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval. We will work closely with VDGIF to pull together data necessary to complete this analysis. We propose to expand the areas in which deer hunting opportunities would be provided. In order to meet the needs of 90% of the participants, new opportunities would be provided in areas located in the North and West sides of the Refuge (see Strategies below). Deer management in those areas has become increasingly more important over the past couple years due to overbrowsing on Refuge habitats and local agriculture; however new hunting zones would be established in two phases in order to accomplish existing habitat management objectives. The hunt serves a dual purpose of providing public opportunity for hunting, while deer populations are reduced, a necessity for proper habitat management.

Implementing new hunt areas would be administered the same way as our existing hunt on the barrier spit, which includes a lottery system in cooperation with VDGIF. We have identified a hunter density of 1 pair of hunters per every 50 acres of suitable deer habitat within designated hunting zone. Some zones would be designated as bow hunting only. Each new zone would be open to selected hunters 3 to 5 consecutive days in each of October, November, and December, in accordance with VDGIF season dates. Hunters applying to hunt the new zones can select a preferred zone and month to hunt. Parking would be provided at selected sites throughout the new zones. Parking availability would be re-evaluated whenever new Refuge land is acquired. Maps and permits would be sent out to all selected hunters. Hunters would be responsible for carrying their permits at all times and would be required to report (call in) whether or not they hunted and any deer harvested. Signage would be posted along waterways

adjacent to hunt zones. Refuge law enforcement as well as state law enforcement would ensure that all hunters follow state and refuge regulations. No "drive-hunting" would be allowed in these areas – only still-hunting would be permitted. Dogs would not be allowed when hunting in these areas. In addition, no rifles or crossbows would be allowed.

Safety of residents, hunters, and other visitors is important. We would clearly post hunting areas and adjacent waterways to notify boaters and land-based visitors of potential hunting activity.

In addition to expanding hunting areas, we will coordinate with the State to initiate a youth hunt on the Refuge, as part of our increased environmental education initiative (Connecting Children with Nature) and expansion of priority public uses (see Objective 5.b). This would include hunting of both white-tailed deer and feral hogs. We will dedicate one of the current eights zones for the youth hunt on the opening Saturday of the season. Adult hunts will then begin the following Saturday. The zone would be determined and advertised for each new season. During our youth hunts, we will enforce the one gun rule. Only the child can carry a gun, not the adult that accompanies them.

We will conduct, under this action, periodic reevaluation of the hunting program. This evaluation will help us to determine if we are adequately meeting the management needs. Depending on the results of the evaluation, the hunt would be expanded, reduced or maintained to meet management needs. An evaluation of the hunt would take place once every 3 years.

We define a high-quality hunt program as one that:

- Maximizes safety for hunters and other visitors;
- Encourages the highest standards of ethical behavior in taking or attempting to take wildlife;
- Is available to a broad spectrum of hunting public;
- Contributes positively to or has no adverse effect on population management of resident or migratory species;
- Reflects positively on the individual Refuge, the System, and the Service;
- Provides hunters uncrowded conditions by minimizing conflicts and competition among hunters;
- Provides reasonable challenges and opportunities for taking targeted species under the described harvest objective established by the hunting program. It also minimizes the reliance on motor vehicles and technology designed to increase the advantage of the hunter over wildlife;
- Minimizes habitat impacts;
- Creates minimal conflict with other priority wildlife-dependent recreational uses or Refuge operations; and
- Incorporates a message of stewardship and conservation in hunting opportunities.

Strategies:

Continue to:

- Conduct a minimum seven-day white-tailed deer and feral hog hunt each year
- Evaluate hunter satisfaction, as well as harvest rates of deer and hogs, to make management changes as needed to meet the Refuge goals, vision and purpose.
- Partner with Virginia Department of Game and Inland Fisheries to administer the hunt via a computerized permitting system.

Within 3 years of plan's approval:

- Fully analyze the potential of adding waterfowl hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval.
- Work with VDGIF to assist with implementing a waterfowl hunt at Redhead Bay. Blind stakes will be located at three sites (Map 4-4).
- Implement a limited waterfowl hunt at Colchester impoundment in partnership with VDGIF.
- Support VDGIF with waterfowl hunt at FCSP by providing parking at Refuge. Within 3 years of CCP approval (phase 1):
- Fully analyze the potential of expanding deer hunting (as described below) through a complete and separate NEPA analysis. Work with VDGIF to pull together data necessary to complete this analysis.
- Expand deer hunting opportunities in the Sandbridge area, north and south of Sandbridge Road on Tracts 101d, 102, 103, 104, 104a, 104b, 106, 108b, and 110 (Zones A, B, C, D). Parking would be provided at the old tower pad on Tract 107 (Zone A) and we would coordinate with the City of Virginia Beach for possible parking spots at the Sandbridge Fire Station (adjacent to Zone D) and along the utility right-of-way adjacent to Tract 106b (Zones B, C) (Map 4-5).
- Expand deer hunting opportunities (bow only) at the end of Bank Lane on Tract 127a (Zone G), and along Muddy Creek Road on Tracts 163, 166, and 169 (Zone I). Parking would be provided on federal property at the end of Banks Lane and on Tracts 163a and 166, respectively.
- Expand deer hunting along Muddy Creek Road at Pleasant Ridge Road on Tract 194 (Zone J), with parking on site.
- Implement a youth hunt on opening day in Zone 4 (refer back to Map 4-5).
- Evaluate the feral hog and deer hunt to determine if they are meeting management needs.

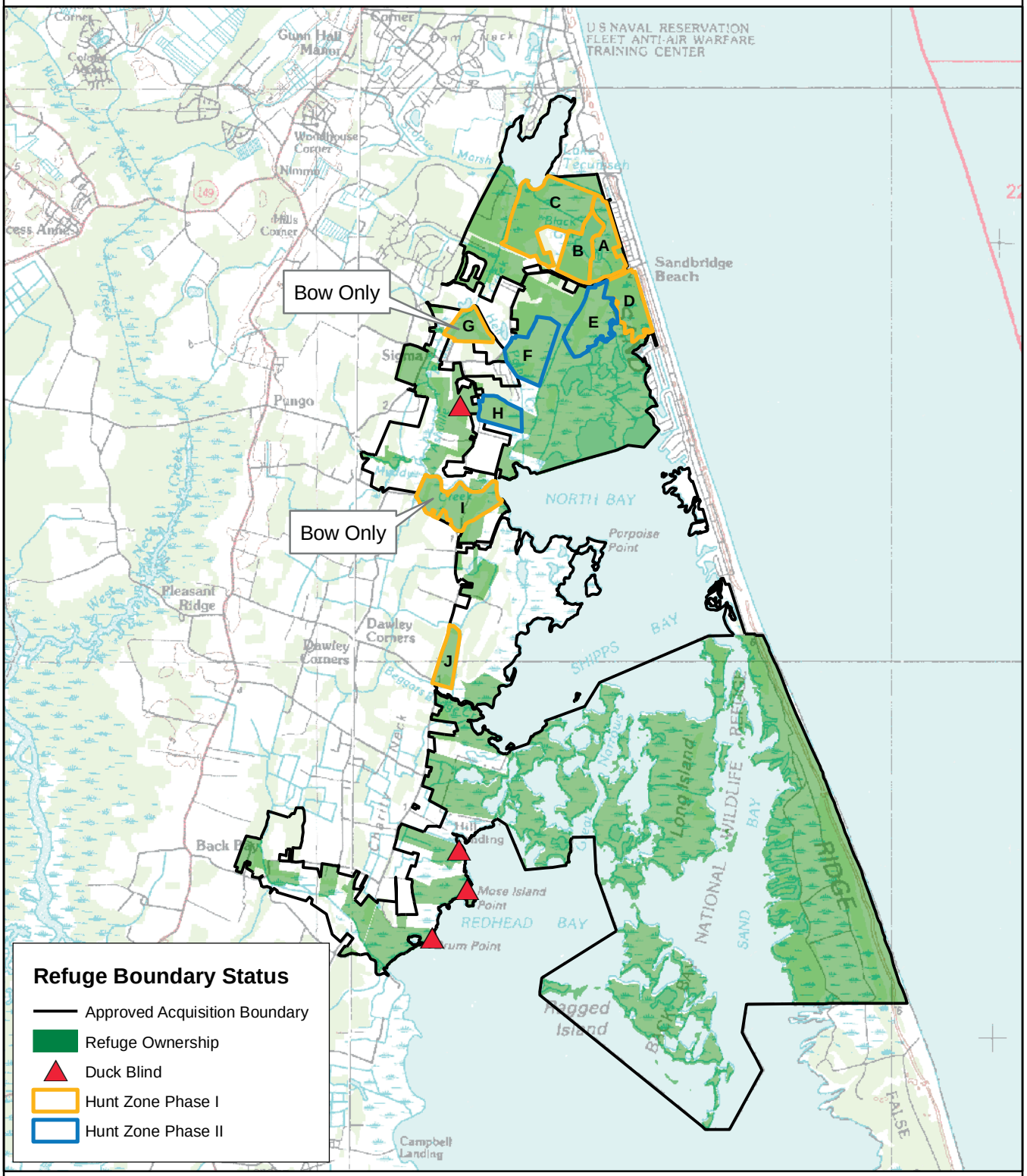
Within 10 years of CCP approval (phase 2):

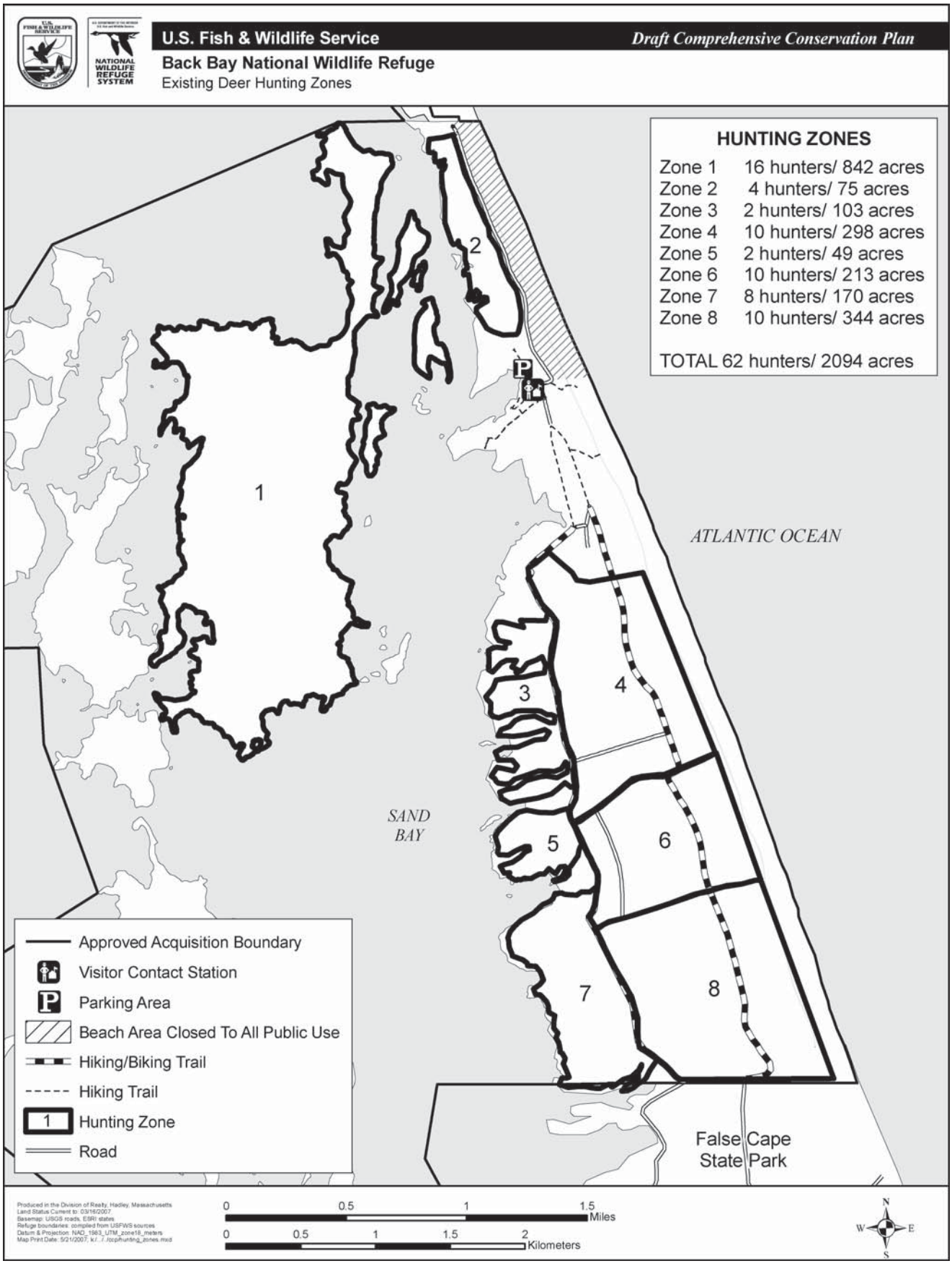
- Expand deer hunting opportunities south of Sandbridge Road at the "old hunt club" on Tract 104b (Zone E). This portion of Tract 104b has an existing road and parking area on site.

U.S. Fish & Wildlife Service *Draft Comprehensive Conservation Plan*

Back Bay National Wildlife Refuge

Alternative B: Proposed Deer and Waterfowl Hunting Expansion




U.S. Fish & Wildlife Service
Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Existing Deer Hunting Zones
HUNTING ZONES
Zone 1 16 hunters/ 842 acres
Zone 2 4 hunters/ 75 acres
Zone 3 2 hunters/ 103 acres
Zone 4 10 hunters/ 298 acres
Zone 5 2 hunters/ 49 acres
Zone 6 10 hunters/ 213 acres
Zone 7 8 hunters/ 170 acres
Zone 8 10 hunters/ 344 acres
TOTAL 62 hunters/ 2094 acres
ATLANTIC OCEAN
SAND BAY
False Cape State Park
Approved Acquisition Boundary
Visitor Contact Station
Parking Area
Beach Area Closed To All Public Use
Hiking/Biking Trail
Hiking Trail
Hunting Zone
Road
Miles
Kilometers
N
W
E
S

- Expand deer hunting opportunities east of Sandbridge Road at the "reforestation site" on Tract 125a (Zone F). This area has an existing road and parking area on site.

- Expand deer hunting opportunities east of Colchester Road on Tract 150 (Zone H). This area has an existing road and parking area on site (Map 4-4).

Objective 6b. Waterfowl Hunting

Within 3 years of CCP approval, provide a high-quality waterfowl hunt program in partnership with the VDGIF at Redhead Bay and Frank Carter impoundments on Colchester Road.

Rationale for Objective

As part of our increased environmental education initiative and expansion of priority public uses (see Objective 5.b), we will conduct a waterfowl hunting program in two areas within the Refuge. This hunting program will be administered according to both State and Refuge regulations. One waterfowl hunting area is Redhead Bay, located south of the Presidential Proclamation area. We will provide three sites within this area for waterfowl hunting, located on Back Bay on Tracts 229, 217, and 214-I. These areas will be designated by three stakes that would accommodate temporary (i.e. float/boat) waterfowl hunting blinds. The VDGIF would assist with implementing the waterfowl hunt three days per week during the season. In order to ensure that hunters are not building additional blinds in the three staked areas, we will have a law enforcement official check each stake periodically.

The second waterfowl hunting area is the Frank Carter impoundments. An annual one-day limited youth waterfowl hunt will be implemented here in partnership with the VDGIF. Construction at this site will be minimal considering a small parking lot is already in place.

A partnership with VDGIF will provide benefit to both parties. In return for aiding us with our waterfowl program, we will provide support to VDGIF with the waterfowl hunt at FCSP. This support will include providing parking on the Refuge to those hunting at FCSP. As explained with the deer hunt, we will fully analyze the potential of adding waterfowl hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval.

Strategies:

Continue to:

- Conduct law enforcement patrols to ensure no migratory bird hunting is occurring.

- Replace proclamation boundary markers to delineate the boundary.

- Provide environmental education in support of the objective.

Within 3 years of plan's approval:

- Fully analyze the potential of adding waterfowl hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval.

- Work with VDGIF to assist with implementing a waterfowl hunt at Redhead Bay. Blind stakes will be located at three sites (Map 4-3).
- Implement a limited waterfowl hunt at Frank Carter impoundments in partnership with VDGIF.
- Support VDGIF with waterfowl hunt at FCSP by providing parking at Refuge

Objective 6c. Fishing

Within 5-7 years of CCP approval, expanding high-quality fishing opportunities on the Refuge.

Rationale for Objective

During the Refuge expansion proposal in the 1990's, the Refuge promised to work with the City of Virginia Beach to provide additional public access to Back Bay for uses compatible with Refuge purposes. There are limited shoreline public access points on Back Bay. As part of our efforts to expand priority public uses, in cooperation with the City of Virginia Beach and VDGIF, we will provide enhanced fishing access at Hell's Point Creek and Beggars Bridge Creek. As was discussed under Goal 5, we will develop these two multiple use sites (please refer to objectives under Goal 5 for additional information). As stated earlier, we will develop a low-impact canoe/kayak launch ramp (where one could fish from), an 8 to 12 car parking lot (unless it's already present) and a restroom.

We will expand the number of fishing education events that we have on the Refuge. We will have one additional fishing education event per year, thus making a total of two fishing education events per year (See Rationale under Goal 5). The second event, to be hosted in the spring, will be coordinated and co-hosted with VDGIF. This event would be more like a workshop, with a registration fee, and include education on aquatic ecology, fish biology, angling techniques and non-native species. Also, the event would allow attendees to fish and compete for prizes (i.e. fishing derby).

We define a high-quality fishing opportunity as one that:

- Maximizes safety for anglers and visitors;
- Causes no adverse impact on populations of resident or migratory species, native species, threatened and endangered species, or habitat;
- Encourages the highest standards of ethical behavior in regard to catching, attempting to catch, and releasing fish;
- Is available to a broad spectrum of the public that visits, or potentially would visit, the Refuge;
- Provides reasonable accommodations for individuals with disabilities to participate in Refuge fishing activities.
- Reflects positively on the System;
- Provides uncrowded conditions;
- Creates minimal conflict with other priority wildlife-dependent recreational uses or Refuge operation;
- Provides reasonable challenges and harvest opportunities; and

- Increases the visitors' understanding and appreciation for the fisheries resource.

Strategies:

Continue to:

- Allow visitors to fish along the beach, the shore of the bay, and from the D Pool impoundment.
- Work with partners to provide fishing education programs, and instill a conservative recreational fishing ethic through the National Fishing Week special event and other events.
- Complete development of the Horn Point site to provide additional fishing opportunities.
- Provide limited, night surf fishing opportunities through special use permits.

Within 1 year of CCP approval:

- Expand fishing education events at the Refuge to 2 events per year.

Within 5-7 years of CCP approval:

- Provide fishing access at the Hell's Point Creek and Beggars Bridge Creek sites as described earlier.

GOAL 7. **Promote understanding and appreciation for the conservation of fish, wildlife and their habitats and the role of the Refuge in this effort through effective community outreach programs and partnerships.**

Objective 7a. Partnerships With current partners, identify and implement new initiatives and opportunities in interpretation, environmental education, maintenance, habitat enhancement and protection, law enforcement, hunting, and fishing.

Rationale for objective

These objectives would encourage broader cooperation between the Service and local communities, interest groups, and other agency partners. As an urban Refuge with limited internal resources, partnerships are readily available and key to accomplishing Refuge goals and objectives. Further, the Service can be a resource to the community in providing valuable technical **assistance to** area conservation groups. Sharing resources where mutually compatible conservation objectives are apparent is cost-effective, and in the best interest of the Service, the partner organization, and the public.

Strategies:

Continue to:

- Maintain partnership with Ducks Unlimited, an important partner in wetland and waterfowl conservation.

- We will continue to work closely with VA DGIF to develop specific wildlife and fisheries management strategies, protect listed species and valuable resources, and manage hunting and fishing programs.

- Work with FCSP personnel to patrol the Refuge and the Park's beaches for sea turtle nests during the summer. Also, we would cooperate with FCSP on law enforcement efforts, interpretative programming, and special events management and staffing.

- Manage FCSP's two impoundments, including water level management, invasive species control, mechanical habitat management, and prescribed burning.

- Hold annual deer and feral hog hunts simultaneously with FCSP on the Barrier Island.

- Provide assistance to Mackay Island National Wildlife Refuge.

- Have BBRF collect bimonthly water quality data at six selected sites along the western side of Back Bay. We would also partner with BBRF for environmental education, programming, biological issues, and special events.

- Have the Friends of Back Bay NWR group work with Congress to advocate for Refuge land acquisition.

- Recruit, train, and utilize volunteers in public use, biology and maintenance programs.

- Participate in meetings of the Carolina Virginia Strategic Habitat Conservation Team.

Within 2 years of CCP approval:

- Work with False Cape State Park to monitor and assess the effects of natural dune succession and dune swale plant community changes.

- Work with Ducks Unlimited to redevelop impoundment management at the Frank Carter impoundments.

- Pending results of the SAV study, examine and implement best sites for SAV restoration and best restoration technique. Partners could include the Virginia Department of Environmental Quality, Department of Conservation Resources, US Geological Survey, US Army Corp of Engineers, Department of Transportation, US Environmental Protection Agency (EPA), Virginia Institute of Marine Services, and a variety of agencies connected with the North Carolina Department of Environment and Natural Resources.

- Work with partners to treat phragmites areas on private lands immediately adjacent to Refuge property

- Continue to work with partners and the Corps of Engineers in the feasibility study to restore the Albermarle-Pamlico Esturine System, including Currituck Sound and Back Bay.

Within 5 years of CCP approval:

- Complete a Cooperative Management Agreement with the City of Virginia Beach for enhanced law enforcement service, including increased patrol coverage of Refuge lands.

- Increase off-site environmental education programs by 20% over current levels.

Over the duration of this plan:

- The Refuge would support multi-use trails as proposed by the City of Virginia off of Refuge lands that are also compatible with Refuge purposes.

Objective 7b. Individual and Volunteerism Opportunities

Within 2-5 years of CCP approval, increase Refuge volunteerism hours by 5 to 10% to enhance visitor service, maintenance, habitat management, and resource protection efforts.

Rationale for Objective

The expansion of visitor facilities and services, as well as the projected increase in visitation, would require additional staffing support to meet public expectations, and provide for public safety, convenience, and a high quality experience for Refuge visitors. Current staffing projections for the foreseeable future appear constrained, and are not expected to change with the addition of new facilities. Partnering, interagency agreements, service contracting, internships, and volunteer opportunities will increase in order to provide this staffing support.

Strategies:

Within 2 years of plan's approval:

- Increase volunteer hours by 5% over current levels through proactive recruitment, enhanced outreach, and increased opportunities on the Refuge.

- Recruit a volunteer to help manage the volunteer program.

- Integrate volunteer program with other Refuge support groups, including but not limited to Back Bay Restoration Foundation (BBRF), "Reese's Pieces," Friends, and work campers.

Within 5 years of plan's approval:

- Increase Refuge volunteer hours by 10% over current levels through proactive recruitment, enhanced outreach, and increased opportunities on the Refuge.

Objective 7c. Public Use Facilities

Within 10 years of CCP approval, expand and/or replace existing public use facilities (identified in table 3.9. Refuge Infrastructure, in Chapter 3), and adjust current. VCS operating schedule to provide for enhanced visitor services and accommodate an anticipated minimum 10% visitation increase over the period.

Rationale for Objective

This objective would provide for safe and convenient access to Refuge resources in order to promote public education and understanding of resource values. We must maintain our public use infrastructure to provide a "go to" location to get questions answered and host public use events on the Refuge.

Strategies

Continue to:

- Maintain the current Office/Visitor Contact Station and maintenance compound at the barrier island in Sandbridge.

- Maintain the ABCEEC as the primary environmental education site and office space for BBRF

- Keep Visitor Contact Station open from 8am-4 pm on Monday-Friday (year round), 9am-4pm Saturday & Sunday (April 1 through October 30); closed Saturdays (November 1 through March 31) and closed all federal holidays except Memorial Day, Independence Day, and Labor Day.

Within 1 year of CCP approval:

- Change VCS operating schedule – Close Sundays instead of Saturday from November 1 through March 31. We would continue to operate 7 days per week from April 1 through October 31, including being open on the 3 major summer holidays (Memorial Day, Independence Day, and Labor Day).

  Utilize Rightmier House as temporary office space until new Headquarters/ VCS is completed.

Within 5-7 years of CCP approval:

- Develop and design a new facility to serve as a refuge headquarters (Region 5 standard design for medium facility) VCS and EEC..

Upon completion of new Headquarters/VC, the following additional strategies are proposed:

- Evaluate option of operating new Headquarts/VC 7 days per week.

- Work with City of Virginia Beach to realign New Bridge Road (Note: This strategy can, and should, be done as part of the development, design and construction of the new HQ/VCS.)

- Utilize ABCEEC site as office and facility for maintenance. After the Rightmier House has been updated to be more energy-efficient and updated to meet electrical codes, it may be utilized by Refuge partners or staff as office space.

- Provide new office space for BBRF.

- Maintain and improve current office as primary visitor contact facility and possible sales outlet for cooperating association (BBRF).

Other Management Actions

These actions are not specific to any goals or objectives but will be completed within the 15 year comprehensive planning timeframe.

Refuge Step-Down Plans

The Refuge will complete these step-down management plans as shown:

- Habitat Management Plan (HMP)

The HMP is being written in conjunction with the CCP, and is expected to be finished in calendar year 2010. This Plan serves as an "umbrella document" under which other Refuge Habitat Plans operate, and will carry out the habitat goals and objectives of the CCP. The HMP will include marsh and water management, forest management, and cropland management.

- Inventory and Monitoring Plan (IMP)

An approved IMP exists for Back Bay NWR, but it needs amending/updating. Revisions will be completed within two years of the finalized HMP. A considerable number of inventory and monitoring strategies are included in Goals 1 and 4 of the CCP.

- Fire Management Plan (FMP)

An FMP (and accompanying EA) is in draft form and will be completed in 2011, as mandated by the Service. The Fire Plan will address wildland and prescribed fire events with guidelines on the level of protection needed to ensure safety, protect facilities and resources, and restore and perpetuate natural processes. This plan is expected to meet the needs of the Refuge for fire management.

- Hunting Plan

The 1998 Refuge Hunting Plan provides justification and the framework for the annual Refuge deer and hog hunt. The need for adequate, efficient controls on both deer and feral hog populations is explained in this Plan. Because of adoption of Virginia Department of Game and Inland Fish (VDGIF) Cyberdata hunter selection process, many administrative changes to Refuge Hunt operations have occurred which required that this Plan be amended. An amended version was completed and approved in July 2006. In the proposed action, we propose to fully analyze the potential of adding waterfowl hunting and expanding the area of deer and hog hunting through a complete and separate NEPA analysis. The refuge intends to begin this analysis within 3 years of CCP approval. We will need to work closely with the state to pull together data necessary to complete this analysis.

- Integrated Disease Prevention and Control Plan

This Plan was amended and approved in January 2007. It is a comprehensive plan that includes recent concerns about avian influenza, West Nile virus and chronic wasting disease.

- Public Use Plan

This Plan was amended and approved in 1990, with addendums in 1992 and 1994. Updating this plan is required to account for approved changes in the final CCP. Revisions will be completed within 3 years of CCP approval, and will be consistent with recent visitor services policies developed by the Service.

Cultural Resources

- Within 5 years of CCP approval, develop a study comparable to the 1989 Goodwin report for lands subsequently acquired and within the acquisition boundary. This will assist refuge management, especially in: avoiding inadvertent facility location and impact of habitat work on areas sensitive for archaeological sites; helping to avoid inadvertent acquisition of historic

structures; identifying Archaeological Resources Preservation Act (ARPA) law enforcement issues; and broadening the Refuge's potential historic interpretation coverage to the Pungo area.

- Within 5 years of CCP approval, establish ARPA training for refuge officers, proactive development of an ARPA response team (law enforcement officers, archaeologist, and Assistant United States Attorney), and site monitoring during normal law enforcement rounds. Monitor the Bay Trail site, and consider slight relocation of the trail to avoid the historic site in the long term.

- With 5-8 years of CCP approval, develop a program of monitoring, assessment, and protection and/or data recovery of sites susceptible to erosion.

- Within 5-7 years of CCP approval, upgrade the storage and security of the antique waterfowling equipment collection. If a new facility is built or the existing facility upgraded, security, climate control, storage, and display of this collection will be included in design of the facility.

- Within 8 years of CCP approval, develop a shipwreck site reporting and study protocol. Thanks to effective and timely professional networking among maritime archaeologists, studies of storm-revealed wreck sites here and elsewhere in the region have been valuable. These studies have always been performed gratis by United States Navy (USN), National Oceanic and Atmospheric Administration (NOAA), and State Historic Preservation Office (SHPO) staff, as well as academic professionals and maritime archaeological societies. These wrecks are a trust resource, just as are the terrestrial sites; however, the most effective treatment of them is to monitor their locations, study them as they appear, and recover them with beach material if they are at risk of further erosion, looting and/or damage by visitors. A systematic and proactive team approach would be beneficial to handing this issue at Back Bay, as well as at other refuges where historic wrecks appear. A Regional Memorandum of Understanding (MOU) , or series of MOUs, with agencies and institutions called to study wrecks would be an ideal approach—potentially including a mechanism for reimbursement of such partners for expenses incurred, or in-kind services such as temporary housing or on-refuge transportation in refuge vehicles or boats.

Under this action we will continue to manage Refuge facilities trails and other recreational assets, and equipment. Management of facilities and equipment includes wetlands renovation, repair and maintenance of impoundment dikes, water control structures, pump station, canoes, boats and motors, docks, boat ramps and heavy equipment. In order to work on forested land that is located six to ten miles from the headquarters, the Refuge must also maintain and transport vehicles, tools (power and hand), and heavy equipment.

- Allot an annual budget of at least $32,000 (FY 07 dollars) for facilities and equipment maintenance.

When implementing construction projects, we will adhere to the following best management practices:

- Use, where possible, of water for dust control

- Covering of open equipment for conveying materials

- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

- Grounds should be landscaped with hardy native plant species to conserve water as well as minimize the need to use fertilizers and pesticides.
- Convert turf to low water-use landscaping such as drought resistant grass, plants, shrubs and trees.
- Low-flow toilets should be installed in new facilities.
- Consider installing low-flow restrictors/aerators to faucets.
- Improve irrigation practices by upgrading with a sprinkler clock; watering at night, if possible, to reduce evapotranspiration; installing a rain shutoff device; and collecting rainwater with a rain bucket or cistern system with drip lines.
- Consider replacement of old equipment with new high-efficiency machines to reduce water usage by 30-50 percent per use.
- Check for and repair leaks (toilets and faucets) during routine maintenance activities.
- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable.
- Preserve the top 12 inches of material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub or forested). The applicant should take all appropriate measures to promote re-vegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats or geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- All non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading or filling activities should be clearly flagged or marked for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Measures should be employed to prevent spills of fuels or lubricants into state waters.

- Maintain undisturbed wooded buffers of at least 100 feet in width around all onsite wetlands and on both sides of all perennial and intermittent streams

- Prior to implementation, erosion and sedimentation controls would be designed in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. These controls would be in place prior to clearing and grading, and maintained in good working order to minimize impacts to state waters. The controls would remain in place until the area is stabilized.

We will continue to encourage and support research and management studies on Refuge land that are relevant to approved Refuge objectives. The Refuge will also consider research for other purposes that may not be directly related to Refuge-specific objectives, but contribute to the broader enhancement, protection, use, conservation, and management of native populations of fish, wildlife and plants, and their natural diversity within the region. All researchers will be required to submit a detailed research proposal following the guidelines established by Refuge staff. Refuge biologists and other Service staff will be asked to review and comment on research proposals. Special use permits will identify the schedules for progress reports, the criteria for determining when a project would cease and the requirements for publication or other final reports. All publications will acknowledge the Service and the role of Service staff in the particular research project.

- Encourage and support research and management studies unrelated to Refuge objectives, but which contribute to protection, use, conservation, and management of native populations of fish, wildlife and plants. Continue to participate with VDGIF in their study of feral hog natural history, population, and habitat use.

- Encourage and support research and management studies on Refuge land that are relevant to approved Refuge objectives.

Refuge Fee Program

- Collect an entrance fee from April through October and then suspend fee collection from November through March. The entrance station provides a checkpoint to inform about appropriate resource use and protection, and to provide another source for visitor information. Funds generated from the fee collection program are used to provide revenue enhancement for public use facility operation and maintenance, as well as for various habitat management projects that offer public use opportunities.

- Serve as a sales outlet for Federal Recreation passport sales, including the Service Duck Stamp.

Beach Permittee Program

For many years, Back Bay NWR was open to vehicular beach access and use by the general public. In 1969, with visitation reaching 348,000 yearly, it became evident the increased Refuge and beach use had resulted in environmental degradation and a serious conflict of the Refuge's intended purpose. In 1972, the Refuge beach was closed to all unauthorized vehicular traffic. In 1973, after a final ruling in the Federal Register, permits were issued for vehicular beach use only to property owners and businesses south of Back Bay NWR up to a point 1,600 feet south of the Currituck Lighthouse in North Carolina. These permits were issued to individuals providing proof of residency and

businesses that required need for beach access to reach Virginia as recreational traffic was prohibited. All permits are grandfathered back to the Refuge and are not transferable after use is no longer needed, or after the permittee no longer meets the permit guidelines. Originally, approximately 100 permits were issued. That number has slowly dropped to the present day of 15 residential, 5 commercial, and 9 cooperator permits. No new permits may be authorized, so as permits expire, the number of permits will continue to decrease through attrition of this Refuge activity. The Refuge does however allow vehicular beach access use to co-operative agencies such as law enforcement and fire and rescue operations that can show a direct need for beach access. Under all of the alternatives, we would continue phasing out Refuge Motor Vehicle Access (MVA), according to the Federal law, to minimize erosion impacts of oceanfront beaches and lost shorebird use during spring and fall migrations. We would continue to authorize existing permits for vehicular beach access to only property owners and businesses south of the Refuge up to a point 1,600 feet south of the Currituck Lighthouse in North Carolina.

Law Enforcement

All of the alternatives would maintain the Refuge's proactive law enforcement program. This program would enforce Federal, State, and local laws. Primary enforcement efforts concentrate on the protection of natural resources and enforcing the Refuge specific regulations, through proprietary jurisdiction. The Refuge law enforcement program also provides for the safety of those individuals who visit the Refuge.

- Close seasonal dike trails from November through March annually in order to prevent disturbance of wintering migratory waterfowl within the impoundments.
- Prohibit waterfowl hunting in the Presidential Proclamation area composed of 4,600 acres of bay waters and the impoundments (Note: Additional hunting strategies are covered in Goal 6).
- Conduct regular law enforcement patrols for visitor and resource protection.
- Patrol Refuge property along with Virginia Beach Police and State Officers, primarily from False Cape State Park (FCSP). Virginia State Conservation Officers also enforce State regulations on the Refuge.
- Open the Refuge to visiting public from one-half hour before sunrise to one-half hour after sunset every day of the year, except during the annual hunt in October. Provide law enforcement coverage during the October night surf fishing season.
- Prohibit non-wildlife dependent activities such as sunbathing, surfing, picnicking, and swimming. Dog-walking is prohibited in certain areas for all alternatives, and is eliminated in Alternatives B and C.

Refuge Partnerships

Maintaining partnerships with various state, local and private agencies and organizations plays a very important part in the continued success of Refuge management. Refuge partnerships provide assistance in conducting Refuge inventories and surveys, advocacy for Refuge funds, and maintenance of communication and contact with the community. All of the alternatives would continue to maintain and enhance the Refuge's current partnerships.

Refuge Revenue Sharing

As described in Chapter 3, the Service pays Virginia Beach refuge revenue sharing payments based on the acreage and value of refuge land in their jurisdiction. The payments are calculated by formula, and funds are appropriated

by Congress. All of the alternatives will continue those payments in accordance with the law, commensurate with changes in the appraised market values of refuge lands or new appropriations by Congress.



USFWS

The loggerhead—a Federally threatened nesting species of Back Bay NWR beaches

Glossary
(including list of acronyms)

Glossary

accessibility	the state or quality of being easily approached or entered, particularly as it relates to complying with the Americans with Disabilities Act.
accessible facilities	structures accessible for most people with disabilities without assistance.
alternative	a reasonable way to fix an identified problem or satisfy a stated need (40 CFR 1500.2). Alternatives are different means of accomplishing refuge purposes and goals, contributing to the System mission, and resolving issues. See **management alternative**.
anadromous	fish that spend a large proportion of their life cycle in the ocean and return to freshwater to breed.
angler	someone who fishes, primarily referring to fishing with hooks, and usually with no intent to sell.
anuran	or **Salientian**. Consists of frogs, toads and their close fossil relatives.
appropriate use	a proposed or existing use on a refuge that meets at least one of the following three conditions: the use is a wildlife-dependent one; the use contributes to fulfilling the refuge purpose(s), the System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act was signed into law; or the use has been determined appropriate as specified in section 1.11 of that act.
approved acquisition boundary	a project boundary that the Director of the U.S. Fish & Wildlife Service approves upon completion of the planning and environmental compliance process. An approved acquisition boundary only designates those lands which the Service has authority to acquire or manage through various agreements. The approval of an acquisition boundary does not grant the Service jurisdiction or control over lands within the boundary, and it does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the System until the Service buys them or they are placed under an agreement that provides for their management as part of the System.
aquatic	growing in, living in, or dependent upon water.
benthic	living at, in or associated with structures on the bottom of a body of water.
best management practices	land management practices that produce desired results (i.e., usually describing forestry or agricultural practices effective in reducing non-point source pollution, like reseeding skidder trails or not storing manure in a flood plain. In their broader sense, practices that benefit target species).

bight	a bend in a coast forming an open bay, or a bay formed by such a bend.
biological diversity or biodiversity	the variety of life and its processes and includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
biological integrity	biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms and communities.
bird conservation region (BCR)	ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues (see http://www.nabci-us.org/bcrs.html for more information).
breeding habitat	habitat used by migratory birds or other animals during the breeding season.
buffer zones	protective land borders around critical habitats or water bodies that reduce runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals and plants and their habitats.
candidate species	see Federally listed species.
canopy	the uppermost spreading branchy layer of a forest.
canopy dominants	the major trees whose branches make up the canopy of a forest.
Categorical Exclusion (CE, CX, CATEX, CATX)	a category of actions that do not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a Federal agency pursuant to the National Environmental Policy Act.
Challenge Cost Share Program	a grant program administered by the USFWS providing matching funds for projects supporting natural resource education, management, restoration and protection on Service lands, other public lands and on private lands.
Code of Federal Regulations (CFR)	a compilation of all regulations issued by the agencies of the Federal government. It may be searched over the Internet at Exit from EPA pages www.access.gpo.gov/nara/cfr/cfr-table-search.html. Title 40 of the CFR ("40 CFR") contains regulations governing the environment.
community type	a particular assemblage of plants and animals, named for the characteristic plants.
compatible use	an allowed use that will not materially interfere with, or detract from, purposes for which the unit was established (Service Manual 602 FW 1.4).

compatibility determination	a compatibility determination is required for a wildlife-dependant recreational use or any other public use of a refuge. A compatible use is one which, in the sound professional judgement of the Refuge Manager, will not materially interfere with or detract from fulfillment of the Refuge System Mission or refuge purpose(s).
Comprehensive Conservation Plan (CCP)	a document that describes the desired future conditions of the refuge and provides long-range guidance and management direction to accomplish the purposes of the refuge, contribute to the mission of the System, and meet other relevant mandates. See http://www.fws.gov/northeast/planning/.
concern	see issue.
conservation	the management of natural resources to prevent loss or waste. Management actions may include preservation, restoration, and enhancement.
conservation easement	a legal agreement between a landowner and a land trust or government agency that permanently limits a property's uses in order to protect its conservation values.
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.
cover types	a non-technical higher-level floristic and structural description of vegetation cover.
critical habitat	according to U.S. Federal law, the ecosystems upon which endangered and threatened species depend.
cultural resource inventory	a professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).
degradation	the loss of native species and processes due to human activities such that only certain components of the original biodiversity persist, often including significantly altered natural communities.

Department of the Interior	the nation's principal conservation agency whose mission is to protect America's treasures for future generations, provide access to our nation's natural and cultural heritage, offer recreation opportunities, honor our trust responsibilities to American Indians and Alaska Natives and our responsibilities to island communities, conduct scientific research, provide wise stewardship of energy and mineral resources, foster sound use of land and water resources, and conserve and protect fish and wildlife. Interior is a large, decentralized agency with over **70,600** employees and **200,000** volunteers located at approximately **2,400** operating locations across the United States, Puerto Rico, U.S. territories, and freely associated states. See http://www.doi.gov/ for more information.
designated wilderness area	an area designated by Congress as part of the National Wilderness Preservation System (FWS Manual 610 FW 1.5 draft). Also known as **wilderness**.
disturbance	any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.
easement	an agreement by which a landowner gives up or sells one of the rights on his/her property. For example, a landowner may donate a right of way across his/her property to allow community members access to a river. See also conservation easement.
ecological processes	a complex mix of interactions among animals, plants, and their environment that ensures maintenance of an ecosystem's full range of **biodiversity**. Examples include population and predator-prey dynamics, pollination and seed dispersal, nutrient cycling, migration and dispersal.
ecoregion	a territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related interconnected ecosystems.
ecosystem	a natural community of organisms interacting with its physical environment, regarded as a unit.
ecotourism	visits to an area that maintains and preserves natural resources as a basis for promoting its economic growth and development.
ecosystem-based management	an approach to making decisions based on the characteristics of the ecosystem in which a person or thing belongs. This concept takes into consideration interactions between the plants, animals, and physical characteristics of the environment when making decisions about land use or living resource issues.
emergent wetland	wetlands dominated by erect, rooted, herbaceous plants.
endangered species	a federally protected species which is in danger of extinction throughout all or a significant portion of its range.

endemic	native to and found only in a particular region. See also **indigenous species**, also referred to as **native**.
environmental education (EE)	education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp et al. 1969).
environmental health	the composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.
Environmental Assessment (EA)	a concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact.
Environmental Impact Statement (EIS)	a detailed written statement required by section 102(2)(C) of the NEPA, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-tern uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources.
estuaries	deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.
estuarine wetlands	"The Estuarine system consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land" (Cowardin et al. 1979.
eutrophication	the process of nutrient enrichment in aquatic ecosystems. In marine systems, eutrophication results principally from nitrogen inputs from human activities such as sewage disposal and fertilizer use. The addition of nitrogen to coastal waters stimulates algal blooms and growth of bacteria, can cause broad shifts in ecological communities, and contribute to anoxic events and fish kills.
exotic species	a species that is not native to an area and has been introduced intentionally or unintentionally by humans; not all exotics become successfully established. Also known as **non-native species**.
extirpated	no longer occurring in a given geographic area.
Federal Fee Demonstration program	an experimental initiative that authorized the four federal land management agencies–the National Park Service, the Fish & Wildlife Service, the Bureau of Land Management and the U.S. Forest Service–to charge fees to visitors and keep the revenues for reinvestment into visitor facilities and services.

Federal land	public land owned by the Federal government, including lands such as National Forests, National Parks and National Wildlife Refuges.
Federally listed species or Federal-listed species	a species listed under the federal Endangered Species Act of 1973, as amended, either as endangered, threatened or species at risk. Formerly known as **candidate species**.
Federal Register (FR)	The official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents. The Federal Register is published by the Office of the Federal Register, National Archives and Records Administration.
Finding of No Significant Impact (FONSI)	a document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a Federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared.
fire regime	the characteristic frequency, intensity, and spatial distribution of natural fires within a given ecoregion or habitat.
fire return interval	the number of years between two successive fire events at a specific site or an area of a specified size.
floodplain	flat or nearly flat land that may be submerged by floodwaters; a plain built up or in the process of being built up by stream deposition.
flow regime	see hydrologic regime.
focus areas	within each Area of Biological Significance, focus areas further delineate concentrations or “hot spots” for species and habitats of special concern.
forb	a flowering plant, excluding grasses, sedges, and rushes, that does not have a woody stem and dies back to the ground at the end of the growing season.
fragmentation	the disruption of extensive habitats into isolated and small patches. Fragmentation has two negative components for biota: the loss of total habitat area; and, the creation of smaller, more isolated patches of habitat remaining.
fuel ladder	branches, shrubs, or an understory layer of trees, which allow a fire to spread from the ground to the canopy.
fuel loading	adding to the amount of available and potentially combustible material, usually expressed as tons/acre.

geographic information system (GIS)	a computerized system used to compile, store, analyze and display geographically referenced information. Can be used to overlay information layers containing the distributions of a variety of biological and physical features.
global positioning system (GPS)	A worldwide radio-navigation system that was developed by the U.S. Department of Defense. GPS provides highly accurate position and velocity information, on a continuous global basis to an unlimited number of users. The system is unaffected by weather and provides a worldwide common grid reference system. The GPS receiver automatically selects appropriate signals from the satellites in view and translates these into three-dimensional position, velocity, and time. System accuracy for civil users is 100 meters horizontally.
goal	descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units.
grassland	a habitat type with landscapes dominated by grasses and with biodiversity characterized by species with wide distributions, communities being relatively resilient to short-term disturbances but not to prolonged, intensive burning or grazing. In such systems, larger vertebrates, birds, and invertebrates display extensive movement to track seasonal or patchy resources.
habitat	the place where a particular type of plant or animal lives. An organism's habitat must provide all of the basic requirements for life and should be free of harmful contaminants.
habitat conservation	the protection of an animal or plant's habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.
habitat fragmentation	breaking up of a specific habitat into smaller unconnected areas. A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.
habitat management plan (HMP)	A site-specific wildlife habitat plan.
herbaceous	of, relating to, or having the characteristics of an herb; having little or no woody tissue.
herbivory	the loss of vegetation due to consumption by another organism.
historic conditions	the composition, structure and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human-related changes to the landscape.
hydrologic regime	characteristic fluctuations in river flows. Also known as **flow regime**.

impoundment	a body of water, such as a pond, confined by a dam, dike, floodgate, or other barrier, which is used to collect and store water for future use.
indicator species	a species used as a gauge for the condition of a particular habitat, community, or ecosystem. A characteristic or surrogate species for a community or ecosystem.
indigenous species	a species that, other than as a result of introduction, historically occurred or currently occurs in a particular ecosystem. See also **endemic**. Also referred to as **native** species.
interjurisdictional fish	populations of fish that are managed by two or more states or national or tribal governments because of the scope of their geographic distributions or migrations.
interpretive facilities	structures that provides information about an event, place or thing by a variety of means including printed materials, audiovisuals or multimedia materials. Examples of these would be kiosks which offer printed materials and audiovisuals, signs and trailheads.
interpretive materials	any tool used to provide or clarify information, explain events or things, or serve to increase awareness and understanding of the events or things. Examples of these would be: (1) printed materials such as brochures, maps or curriculum materials; (2) audio/visual materials such as videotapes, films, slides, or audio tapes; and (3) interactive multimedia materials, such as cd–rom and other computer technology.
invasability	the relative ability for an **invasive species** to negatively affect a given ecosystem. For example, an **invasive plant** like Asiatic bittersweet has high invasability because it spreads rapidly, where black locust has low invasability because it spreads more slowly.
invasive species, invasive plants	non-native species which have been introduced into an ecosystem, and, because of their aggressive growth habits and lack of natural predators, displace native species. Invasive plants often spread from a single location, coalesce, and convert the native plant community into a uniform patch of invasive species. These invasive plant-dominated areas represent a much lower diversity of plant species and vegetation heights than would be found normally, and as such, are of reduced value to forest and grassland-dependent migratory birds.
invertebrate	any animal lacking a backbone or bony segment that encloses the central nerve cord.
issue	any unsettled matter that requires a management decision; e.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concerns, or the presence of an undesirable resource condition. Issues should be documented, described, and analyzed in the CCP even if resolution cannot be accomplished during the planning process (Service Manual 602 FW 1.4). Also referred to as **concern**.

Land Protection Plan (LPP)	a document that identifies and prioritizes lands for potential Service acquisition from a willing seller, and also describes other methods of providing protection. Landowners within project boundaries will find this document, which is released with environmental assessments, most useful.
land trusts	private, nonprofit organizations dedicated to conserving land by purchasing land, receiving donations of lands, or accepting conservation easements from landowners.
Leave No Trace	"…to avoid or minimize impacts to natural area resources and help ensure a positive recreational experience for all visitors. America's public lands are a finite resource whose social and ecological values are linked to the integrity of their natural conditions and processes. Land managers face a perennial struggle in their efforts to achieve an appropriate balance between the competing mandates to preserve natural and cultural resources and provide high quality recreational use. Visitor education designed to instill low impact ethics and skills is a critical management component and is seen as a light-handed approach that can reduce the need for more direct and regulatory forms of management." (Source: http://www.lnt.org/about/history.html)
lepidoptera	the insect order which includes butterflies and moths.
litter	the uppermost layer of organic debris on a forest floor, composed mainly of fresh or slightly decomposed leaves, bark, twigs, flowers, fruits, and other vegetable matter.
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 plan	a plan that guides future land management practices on a tract of land. In the context of this environmental impact statement, management plans would be designed to produce additional wildlife habitat along with the primary products, such as timber or agricultural crops.
management strategy	a general approach to meet unit objectives. A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (Service Manual 602 FW 1.4).
mean high tide line	the average of all high tide lines.

mean high water	The average height of the high waters over a 19 year period.
Memorandum of Understanding (MOU)	An agreement between agencies that states specific measures the agency will follow to accomplish a large or complex project.
minimum tool	Section 4(c) of the Wilderness Act provides that motorized equipment, mechanical transport, motorboats and aircraft landings are prohibited "*...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...*" Every proposed administrative activity must be evaluated to see if it is required. If so, then it is a "minimum requirement." If it is not feasible to implement the minimum requirement without using generally prohibited activities (e.g. motorized equipment), then using motorized equipment becomes necessary and is the "minimum tool." Feasibility must be determined by physical possibilities—not efficiency, convenience or cost. Each tool's proposed use must be evaluated on its own merits.
mission statement	succinct statement of the unit's purpose and reason for being.
mitigation	actions taken to compensate for the negative effects of a particular project. Fore example, wetland mitigation usually takes the form of restoration or enhancement of a previously damaged wetland or creation of a new wetland.
National Ambient Air Quality Standards (NAAQS)	in the United States, national standards for the ambient concentrations in air of different air pollutants (e.g. ozone and particulate matter) designed to protect human health and welfare. Visit http://epa.gov/ttn/naaqs/.
National Environmental Policy Act of 1969 (NEPA)	requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public 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 (40 CFR 1500).
National Wildlife Refuge (refuge or NWR)	a designated area of land, water, or an interest in land or water within the System, but does not include **Coordination Areas**. See National Wildlife Refuge System.
National Wildlife Refuge System (Refuge System or System)	all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction. "The mission of the System is to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." Also see **National Wildlife Refuge** and http://www.fws.gov/refuges/.

native	see endemic and indigenous species.
native plant	a plant that has grown in the region since the last glaciation and occurred before European settlement.
neotropical migrant	birds, bats, or invertebrates that seasonally migrate between the neararctic and neotropics.
non-consumptive, wildlife-oriented recreation	wildlife observation and photography and environmental education and interpretation.
non-native species	see exotic species.
non-point source pollution	nutrients or toxic substances that enter water from dispersed and uncontrolled sites.
nontraditional angler	an individual or group not typically engaged in angling e.g, women, children, families. Also see **angler**.
Notice of Intent (NOI)	a notice that an environmental impact statement will be prepared and considered. Published in the Federal Register.
objective	an objective is a concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining management strategies, monitoring refuge accomplishments, and evaluating the success of the strategies. Also, see unit objective.
occurrence site	a discrete area where a population of a rare species lives or a rare plant community type grows.
old field	an area that was formerly cultivated or grazed and where woody vegetation has begun to invade. If left undisturbed, it will eventually succeed into a forest. Many old fields occur at sites marginally suitable for crop production or pasturing. Old fields are highly variable in the Northeast, depending on soil, land use history, and management.
oligohaline	Areas of low salinity (nearly free of salt particles)
overbrowsing	the elimination of forest undergrowth by herbivores.
overstory	see canopy.

palustrine wetlands	"The Palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean–derived salts is below 0%" (Cowardin et al. 1979).
pannes	Calcareous, wet, interdunal depressions that form near the water table in interdunal areas.
Partners for Wildlife Program	a voluntary habitat restoration program undertaken by the Service in cooperation with other governmental agencies, public and private organizations, and private landowners to improve and protect fish and wildlife habitat on private lands while leaving the land in private ownership.
partnership	a contract or agreement entered into by two or more individuals, groups of individuals, organizations or agencies in which each agrees to furnish a part of the capital or some in–kind service, i.e., labor, for a mutually beneficial enterprise.
passerine	a bird of the order passeriformes, also known as "perching birds," or, less accurately, as "songbirds." Of the 10,000 or so extant species of birds, over half (~5,300) are perching birds. Perching birds have a worldwide distribution, with representatives on all continents except Antarctica, and reaching their greatest diversity in the tropics.
Payments in Lieu of Taxes	Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries (cf: Refuge Revenue Sharing Act of 1935, Chapter One, Legal Context).
piscivorous	feeding on fish.
planning area	a planning area may include lands outside existing planning unit boundaries currently studied for inclusion in the System and/or partnership planning efforts. It may also include watersheds or ecosystems that affect the planning unit.
planning team	planning teams are interdisciplinary in membership and function. Teams generally consist of a Planning Team Leader; Refuge Manager and staff biologists; and other appropriate specialists including social scientists, ecologists, and recreation specialists. Team members may come from our other programs and other Federal, Tribal, and State natural resource agencies. The planning team prepares the CCP.
population monitoring	assessments of the characteristics of populations to ascertain their status and establish trends related to their abundance, condition, distribution, or other characteristics.
prescribed fire	application of fire to wildland fuels, either by natural or intentional ignition, to achieve identified land use objectives (FWS Manual 621 FW 1.7).

priority public use	a compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.
private land	land that is owned by a private individual, group of individuals, or non–governmental organization.
private landowner	any individual, group of individuals or non–governmental organization that owns land.
private organization	any non–governmental organization.
proposed wilderness	an area of the Refuge System that the secretary of the Interior has recommended to the President for inclusion in the National Wilderness Preservation System. See **designated wilderness area**.
protection	mechanisms such as fee title acquisition, conservation easements or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintenance of the species population at the site.
public	individuals, organizations, and groups; officials of Federal, State, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in the Service issues and those who do or do not realize that Service decisions may affect them.
public involvement	a process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.
public land	land that is owned by the local, state, or Federal government.
purposes of the refuge	the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.
rare species	species identified for special management emphasis because of their uncommon occurrence within a location.

Record of Decision (ROD)	a concise public document prepared by the Federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted–and if not, why they were not–and a summary of monitoring and enforcement where applicable for any mitigation.
refuge goals	descriptive, open-ended and often broad statements of desired future conditions that convey a purpose but do not define measurable units.
refuge lands	those lands in which the Service holds full interest in fee title, or partial interest such as easements.
restoration	management of a disturbed or degraded habitat that results in the recovery of its original state. For example, restoration may involve planting native grasses and forbs, removing shrubs, prescribed burning, or reestablishing habitat for native plants and animals on degraded grassland.
return intervals	see fire return intervals.
riparian	the interface between freshwater habitats and the terrestrial landscape.
riverine	within the active channel of a river or stream.
robust emergents	vigorous wetland vegetation which protrudes above the water level e.g. *Phragmites*, cattail.
runoff	water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.
sandplain grassland	dry grassland that has resisted succession due to fire, wind, grazing, mowing, or salt spray. Characterized by thin, acidic, nutrient-poor soils over deep sand deposits, sandplains primarily occur on the coast and off-coast islands, or inland, where glaciers or rivers have deposited sands.
site improvement	any activity that changes the condition of an existing site to better interpret events, places, or things related to a refuge e.g., improving safety and access, replacing non-native with native plants, refurbishing footbridges and trailways, and renovating or expanding exhibits.
sound professional judgement	an opinion or management decision formed by an individual, or group of individuals, whose work requires the application of theories, concepts, principles, and methodologies typically acquired through completion of a bachelor's or post-bachelor's degree program. Such judgments often require consistent exercise of discretion.

Species of Special Concern	a species not on the federal list of threatened or endangered species, but a species for which the Service or one of its partners has concerns.
state-listed species	**threatened** or **endangered species** within a state's borders that may or may not also be federal-listed species. Also see **federally listed species**.
step-down management plans	plans that describe management strategies and implementation schedules. A series of plans dealing with specific management subjects; for example, croplands, wilderness, and fire (Service Manual 602 FW 1.4).
stopover habitat	habitat used during bird migration for rest and feeding.
strand habitat	a beach or very shallow coastal area dominated by shoreline processes, particularly wave processes.
strategy	a specific action, tool or technique or combination of actions, tools, and techniques used to meet unit objectives.
succession	natural, sequential change of species composition of a community in a given area.
symbolic fencing	Signs, rope, or any other markers that can be used to convey to the public that they are not permitted in a particular area.
threatened species	a federally protected species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
tributary	a stream or river that flows into a larger stream, river or lake.
trust resource	a resource held in trust for the people by the government through law or administrative act. A federal trust resource is one for which trust responsibility is given, in part, to the federal government through federal legislation or administrative act. Generally, federal trust resources are those considered to be of national or international importance no matter where they occur. Trust resources include, but are not limited to, endangered species and migratory birds and fish that regularly move across state lines. In addition to species, trust resources also include cultural resources protected through federal historic preservation laws and nationally important and threatened habitats–notably wetlands, navigable waters, and public lands such as state parks and national wildlife refuges.
trust species	see trust resource.
turbidity	refers to the extent to which light penetrates a body of water. Turbid waters have reduced light penetration, and therefore do not generally support net growth of photo-synthetic organisms.

understory	Plants such as small trees, bushes, herbs and grasses that grow below the **canopy** level in a forest.
unfragmented habitat	large blocks of unbroken habitat of a particular type.
unit objective	desired conditions which must be accomplished to realize a desired outcome. Objectives are the basis for determining management strategies, monitoring refuge accomplishments, and measuring the success of the strategies. Objectives should be attainable and time-specific and may be stated quantitatively or qualitatively (Service Manual 602 FW 1.4).
upland	any land that is not wetland.
U.S. Army Corps of Engineers (USACE)	military and civilian engineers, scientists and other specialists that handle engineering and environmental matters. The USACE is made up of approximately 34,600 Civilian and 650 military members. Responsibilities include planning, designing, building and operating water resources and other civil works projects; designing and managing the construction of military facilities for the Army and Air Force; and providing design and construction management support for other Defense and federal agencies. Visit http://www.usace.army.mil/ for more information.
U.S. Fish & Wildlife Service (USFWS, FWS)	The Service helps protect a healthy environment for people, fish and wildlife, and helps Americans conserve and enjoy the outdoors and our living treasures. The Service's major responsibilities are for migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish. Our mission is "*…working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.*" Visit http://www.fws.gov/who/ for info.
vector-borne disease	disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas e.g., dengue fever, viral encephalitis, lyme disease, and malaria.
vernal pool	depressions holding water for a temporary period in the spring and used by a variety of amphibians for egg laying.
vision statement	concise statement of what the planning unit could be, or what we could do, in the next 10 to 15 years, based primarily upon the System mission and specific refuge purposes, and other relevant mandates.
warm-season grass	native prairie grass that puts on the most growth during summer when cool-season grasses are dormant.

watchable wildlife	all wildlife is watchable. A watchable wildlife program is a strategy to help maintain viable populations of all native fish and wildlife species by building an effective, well-informed constituency for conservation. Watchable wildlife programs are tools by which wildlife conservation goals can be met while at the same time fulfilling public demand for wildlife recreational activities. These activities do not include sport hunting, trapping or sport fishing.
watershed	the geographic area within which water drains into a particular river, stream or body of water. A watershed includes both the land and the body of water into which the land drains.
wetlands	The U.S. Fish & Wildlife Service's definition of wetlands states that "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water" (Cowardin et al 1979).
wilderness	see designated wilderness area.
wildlife management	the practice of manipulating wildlife populations, either directly through regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.
wildlife-dependent recreational use	a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation. These uses are the six priority general public uses of the Refuge System as established in the National Wildlife Refuge System Administration Act.
wildlife-oriented recreation	recreational activities in which wildlife is the focus of the experience. For example, sport hunting and fishing, and plant and animal viewing and photography.

Acronyms

Acronym	Full Name
ABCEEC	Ashville Bridge Creek Environmental Education Center
ACJV	Atlantic Coast Joint Venture
AHMP	Annual Habitat Management Plan
APES	Albemarle-Pamlico National Estuarine System
ARP	Agricultural Reserve Program
ATV	all-terrain vehicles
BBRF	Back Bay Restoration Foundation
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
CMP	Croplands Management Plan
CWCS	Comprehensive Wildlife Conservation Strategy
DU	Ducks Unlimited
Fund	Corolla Wild Horse Fund of North Carolina
EA	Environmental Assessment
EEC	Environmental Education Center
EEE	Eastern Equine Encephalitis
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FCSP	False Cape State Park
FMP	Fire Management Plan
FONSI	Find of No Significant Impact
FSSW	Fisheries, Shellfish, Submerged Aquatic Vegetation and Waterfowl
FWS	US Fish and Wildlife Service
GIS	Geographic Information Systems
HMP	Habitat Management Plan
HQ	Headquarter
HWQM	Hydrodynamics/Water Quality Modeling
IMP	Inventory and Monitoring Plan
MOU	Memorandum of Understanding

Acronym	Full Name
msl	Mean sea level
MVA	Motor Vehicle Access
MWMP	Marsh and Water Management Plan
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NWR	National Wildlife Refuge
Refuge System	National Wildlife Refuge System
RNA	Research Natural Area
RONS	Refuge Operating Needs System
RTNCF	Roanoke-Tar-Neuse-Cape Fear
SAMMS	Service Asset Maintenance Management Systems
SAV	Submerged aquatic vegetation
Service	US Fish and Wildlife Service
SHPO	State Historic Preservation Office
SWAMP	Southern Watershed Area Management Program
TSS	Total suspended solids
VCS	Visitor Contact Station
VDGIF	Virginia Department of Game and Inland Fisheries
VIMS	Virginia Marine Institute of Marine Science
WNV	West Nile Virus
WSAs	Wilderness Study Areas
WUI	Wildland urban interface
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
USN	United States Navy
YCC	Youth Conservation Corps



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Young osprey during banding at a Back Bay NWR nesting platform

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Appendix A



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The tundra swan winters within Back Bay NWR impoundments and shallow bay

Findings of Appropriateness and Compatibility Determinations

COMPATIBILITY DETERMINATIONS FOR PRIORITY PUBLIC USES

- Wildlife Observation, Photography, Environmental Education, and Interpretation
- White tailed Deer and Feral Hog Hunting
- Waterfowl Hunting
- Fresh and Saltwater Fishing and Crabbing

COMPATIBILITY DETERMINATION

USE: Wildlife Observation, Photography, Environmental Education, and Interpretation

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

National Wildlife Refuge System Administration Act of 1996, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 6688dd, et seq.)

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The uses are wildlife-oriented recreational activities: wildlife observation, photography, environmental education and interpretation, including special self-instructed groups participating in these activities. These are priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Refuge Barrier Spit (Northern/Public Use Zone) (Map A-1): This developed area comprises approximately 280 acres, and serves more than 110,000 visitors annually. This area includes a Visitor Contact Station (VCS), interior and exterior interpretive displays, mounted wildlife

viewing scopes, outdoor environmental education classroom and activity pier, pedestrian trail system, two boardwalks providing access to four miles of beach, canoe/kayak launch, wildlife viewing facility with interpretive displays, viewing scopes and adjacent restroom, and an entrance station with approximately one mile of entrance road that exists at the northern portion of the Refuge's barrier spit property. We will expand this zone for public use in order to access the newly constructed wildlife viewing facility (mentioned above), located at the northern edge of the "C" Pool impoundment (see next paragraph).

Refuge Barrier Spit (Southern/Impoundment Zone) (Map A-1): Comprising more than 900 acres of restored wetlands, this section of the Refuge currently provides two dike roads that serve as trails through the Refuge, and provides wildlife viewing and photography opportunity. Visitors must pass through the Refuge Barrier Spit, Northern Zone in order to access this area. No public vehicle traffic or parking is permitted in this area. This area serves more than 20,000 visitors annually. The only change to wildlife-oriented activities planned in this area is to expand public access to the wildlife viewing facility at the northern edge of "C" Pool.

Refuge West Side (Map A-2): The Asheville Bridge Creek Environmental Education Center (ABCEEC) is a 1,800 square foot converted home on a 17-acre parcel. It provides environmental education, interpretation, and wildlife observation and photography via a short self-guided interpretive trail, outdoor classroom, and a wildlife viewing/activity pier. The Horn Point Canoe/ Kayak Launch Facility provides wildlife observation and photography opportunities. There is also a wildlife viewing platform at the Frank Carter Impoundment on Colchester Road.

We have future plans to construct a new Refuge Headquarters and Visitor Contact Station on Tract #244 at the corner of Sandbridge Road and New Bridge Road, which will provide these uses. Located here will be a multi-purpose trail system that will allow for wildlife observation, photography, and self-guided and personal service interpretation via interpretive displays. This proposed public use area comprises approximately 61.5 acres, and is expected to serve more than 150,000 visitors annually. Once the new facility is constructed, we also propose to convert a Refuge house (Tract #135) into an environmental education center.

Three additional canoe/kayak launch sites are planned to be constructed, which will facilitate wildlife observation and photography. These new sites are discussed in detail in a separate Compatibility Determination (see Boat Launching).

(c) When would the use be conducted?

Refuge Barrier Spit (Northern/Public Use Zone): Year-round, one-half hour before sunrise to one-half hour after sunset. A temporary closure to these activities would be implemented during any scheduled Refuge hunt dates.

Refuge Barrier Spit (Southern/Impoundment Zone): From April 1 through October 31, from one-half hour before sunrise to a one-half hour after sunset. Public vehicle access/parking is prohibited year-round. The Southern Zone oceanfront beach remains open to these activities year-round, except on scheduled public hunt dates.

The impoundments provide undisturbed resting and feeding for migratory waterfowl during the winter months; therefore, this area is closed to all public access from November 1 through March 31, with the exception of several monthly wildlife viewing tram trips, provided by Refuge staff. The only change to wildlife-oriented activities planned in this area is the expansion of public access to the wildlife viewing facility.

Refuge West Side: Year-round from one-half hour before sunrise to one-half hour after sunset, at all locations, with the exception of Horn Point Canoe/Kayak Launch Site, which is open from April 1 through October 31 annually. The ABCEEC site is for educational and other organized group visits, by reservation only, for the purpose of environmental education.

(d) How would the use be conducted?
We will conduct these four priority uses much as we conduct them presently. Such activities are allowed on established roads, trails, and in buildings that have been designed to accommodate such uses, in areas that are the least sensitive to human intrusion. These uses are conducted for the general public, as well as for organized groups, including schools and scout groups. Groups of 10 or more are required to have permission to visit the Refuge for these activities, and a seasonal entrance fee from April 1 through October 31 will be charged to all, with the exception of school groups, scouts on merit badge projects assignments, or children under 16 years of age. There is a mix of personal and non- personal program delivery, including interpretive signing, audio-visual presentations, brochures, special events, guided walks and talks, exhibits, web site information, and informal visitor information contacts.

Self-guided groups are those who wish to host their own wildlife dependent activities. As stated above, groups of 10 or more are required to have permission for these activities. Each request must be presented in writing with details of who, what, where, when, why, and how the activity will be conducted. Each request has different logistics, and therefore, would be evaluated for impacts on Refuge purposes. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted. Refuge staff will ensure compliance with the Permit.

(e) Why is the use being proposed?
Wildlife observation and photography, and environmental education and interpretation are four of the six priority public uses of the National Wildlife Refuge System. If compatible, they are to receive enhanced consideration over other secondary public uses.

AVAILABILITY OF RESOURCES:

The resources necessary to provide and administer these uses, at current use levels, is available within current and anticipated Refuge budgets. Staff time associated with administering this use is related to assessing and conducting maintenance, including kiosks, gates and signs, monitoring potential impacts of the use on Refuge resources and visitors, and providing information to the public about the use.

The Visitor Services Manager is available for public outreach. A Park Ranger monitors visitor use and user interactions. The Park Ranger conducts law enforcement activities to provide for visitor safety and resource protection. Maintenance staff performs the regular maintenance and repairs.

Permitting self-guided groups is also within the resources available to administer our Visitor Services Program. Additional staff costs are incurred to review each request, coordinate with the outside entity and process a Special Use Permit, if necessary. Compliance with the terms of the Permit is within the regular duties of the Station Law Enforcement Officer.

ANTICIPATED IMPACTS OF THE USE:

Wildlife observation, photography, environmental education, and interpretation can affect the wildlife resource positively or negatively. A positive effect of public involvement in these priority public uses will be a better appreciation and more complete understanding of Refuge wildlife and habitats. That can translate into more widespread, stronger support for the Refuge, the Refuge System, and the Service.

Wildlife observation and photography have the potential of impacting shorebird, waterfowl, marshbirds and other migratory bird populations feeding and resting near the trails and on beaches during certain times of the year. Use of upland trails is more likely to impact songbirds than other migratory birds. Human disturbance to migratory birds has been documented in many studies in different locations.

Direct Impacts
Direct impacts have an immediate affect on wildlife. We expect those impacts to include the presence of humans disturbing wildlife, which typically results in a temporary displacement without long-term effects on wildlife individuals or populations. Some species will avoid the areas people frequent, such as the developed trails and the buildings, while others seem unaffected by or even drawn to the presence of humans. Overall, those effects should not be significant, because most of the Refuge will experience minimal public use.

Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities includes: departure from site (Owen 1973, Burger 1981, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. The location of recreational activities impacts species in different ways. Miller et al. (1998) found that nesting success was lower near recreational trails, where human activity was common, than at greater distances from the trails. A number of species have shown greater reactions when pedestrian use occurred off trail (Miller, 1998). In addition, Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern U.S. In regard to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived, in the late fall, than later in winter. She also found

gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1997) found that singing behavior of some species was altered by low levels of human intrusion. Pedestrian travel can impact normal behavioral activities, including feeding, reproductive, and social behavior. Studies have shown that ducks and shorebirds are sensitive to pedestrian activity (Burger 1981, 1986). Resident waterbirds tend to be less sensitive to human disturbance than migrants, and migrant ducks are particularly sensitive when they first arrive (Klein 1993). In areas where human activity is common, birds tolerated closer approaches than in areas receiving less activity.

Indirect Impacts
Laskowski et al. (1993), studied behavior of snowy egrets, female mallards, and greater yellowlegs on Back Bay NWR within 91.4 meters of impoundment dikes used by the general public. Behavior of snowy egrets was recorded during August and September 1992 to represent post-breeding marsh and wading birds. Mallards were monitored during migration (November 1992) and during the winter January (1993). Greater yellowlegs' behavior was observed during the northward shorebird migration (May 1993). Behavior was monitored during the typical public activities of walking, bicycling, and driving a vehicle past the sample sites.

The study found that snowy egret resting behavior decreased and alert behavior increased in the presence of humans. Preening decreased when humans were present, but this change was not significant. Feeding, walk/swim, and flight behaviors were not related to human presence. Female mallards in November increased feeding, preening and alert behaviors in the presence of humans. Resting, walk/swim, and flight behavior were not influenced by human presence. In January, female mallard resting and preening behavior were not influenced by the presence of humans. However, feeding, alert, walk/swim, and flight behaviors were related to human presence. Greater yellowlegs increased alert behavior in the presence of humans. No other behaviors were affected. Maintenance behavior (combined feeding, resting, and preening) decreased when humans were present for all study species. In addition, this decrease was accompanied by an increase in escape behavior by each species. Maintenance behavior of mallards in January decreased in the presence of vehicles and combined disturbance. Escape behavior increased when vehicles were present. Maintenance behavior of greater yellowlegs declined when bicycles and vehicles were present but was not influenced by pedestrian presence.

The presence of bicycles and vehicles increased escape behavior. Snowy egrets and female mallards increased movement between subplots and to areas within the study area but further from the disturbance.

During a five year study which involved nine different species of birds, researchers found only minimal evidence that intrusion affected bird distributions (Gutzwiller and Anderson 1999). This study also found that the species affected by intrusion were not consistent from year to year or within study areas and could be due to habituation of intrusion (Gutzwiller and Anderson 1999).

People can be vectors for invasive plants by moving seeds or other propagules from one area to another. Once established, invasive plants can out-compete native plants, thereby altering habitats

and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring and treatment when necessary. Our staff will work at eradicating invasive plants and educating the visiting public. Also, opening Refuge lands to public use can often result in littering, vandalism, or other illegal activities on the Refuge.

Cumulative Impacts
Impacts may be minor when we consider them alone, but may become important when we consider them collectively. Our principal concern is repeated disruptions of nesting, resting, or foraging birds. Our knowledge and observations of the affected areas show no evidence that these four, priority, wildlife-dependent uses cumulatively will adversely affect the wildlife resource. Although we do not expect substantial cumulative impact from these four priority uses in the near term, it will be important for Refuge staff to monitor those uses and, if necessary, respond to conserve high-quality wildlife resources.

Refuge staff, in collaboration with volunteers, monitor and evaluate the effects of these priority public uses to discern and respond to any unacceptable impacts on wildlife or habitats. To mitigate those impacts, the Refuge will continue to close areas to the public to protect wildlife during critical life periods.

PUBLIC REVIEW AND COMMENT:

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

No off-road or off-trail access will be permitted, except for emergency or administrative purposes, for the current motor vehicle access permit program for North Carolina residents, and for hunters.

For self-guided groups, each request must be presented in writing with details of who, what, where, when, why, and how the group activity will be conducted. Each request will then be evaluated for impacts to the Refuge. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted.

JUSTIFICATION:

These four priority public uses provide compatible educational and recreational opportunities for visitors to enjoy Refuge resources, and improve their understanding and appreciation of fish and wildlife, ecology, refuge management practices, and the relationship of plant and animal populations in the ecosystem. Refuge visitors will better understand the Service role in conservation, and opportunities, issues, and concerns faced in management of our natural resources. Further, they will understand the impact that human presence, disturbance, and/or consumption can cause to these resources. Likewise, these four priority uses provide opportunities for visitors to observe wildlife habitats firsthand, and learn about wildlife and wild lands at their own pace in an unstructured environment. Authorization of these uses will result in a greater constituency for achieving Refuge goals, and, ultimately, the Service mission. These activities do not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 15-year re-evaluation date: 09/16/2025
(Date)

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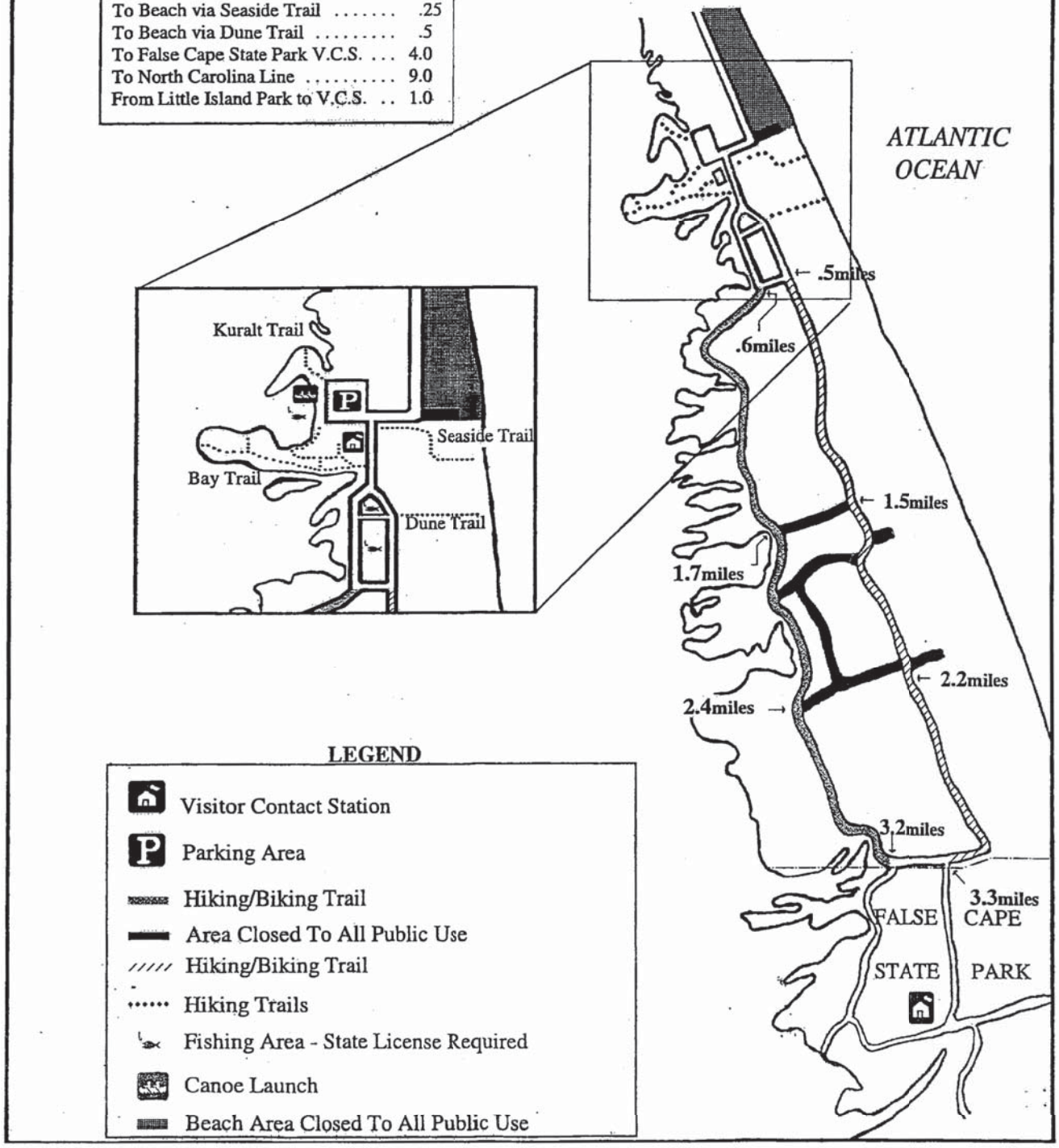
Map A-1

Back Bay National Wildlife Refuge

One-way Mileage from V.C.S.

End of Bay Trail	.4
To Beach via Seaside Trail	.25
To Beach via Dune Trail	.5
To False Cape State Park V.C.S.	4.0
To North Carolina Line	9.0
From Little Island Park to V.C.S.	1.0

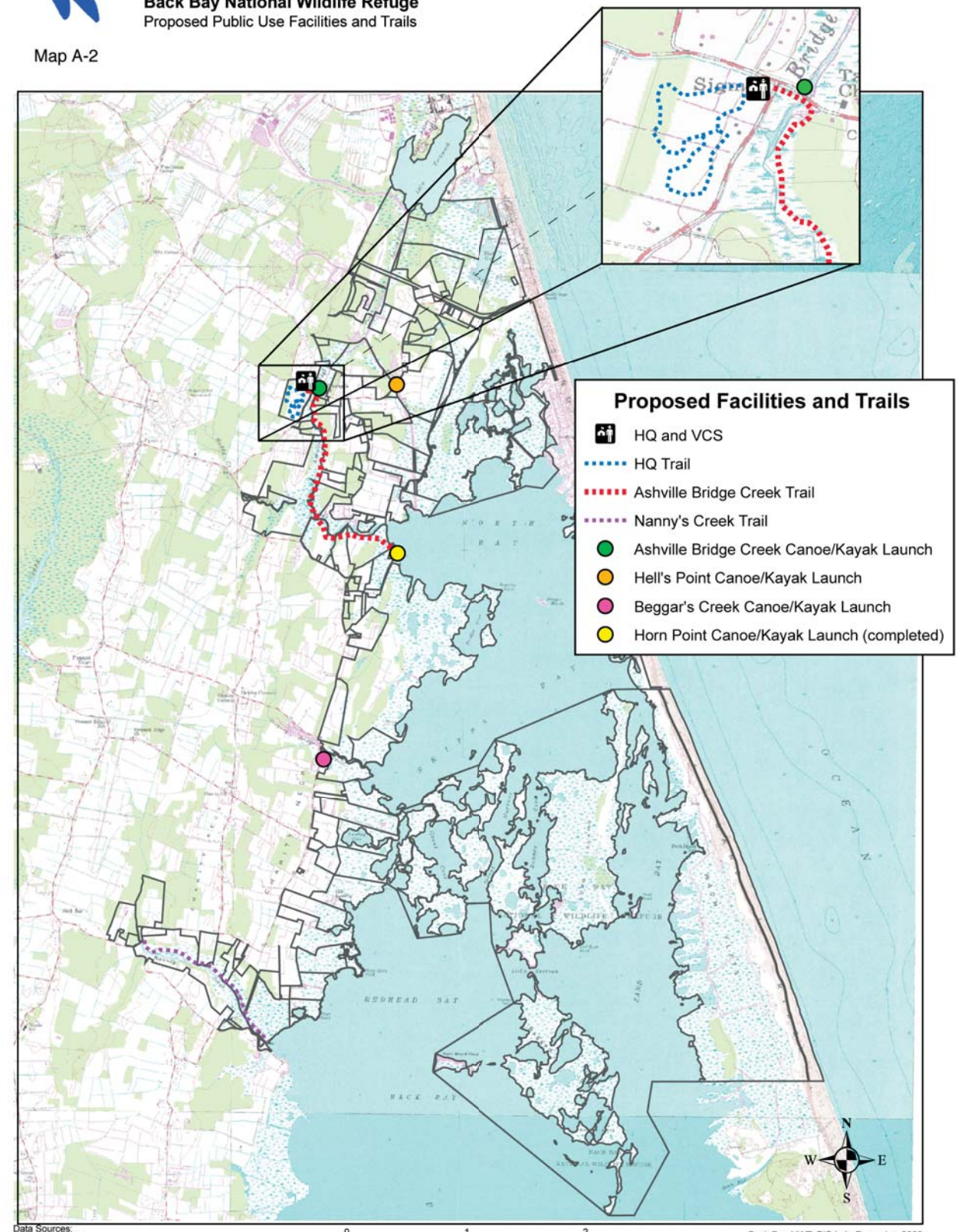


Back Bay National Wildlife Refuge

Draft Comprehensive Conservation Plan

Back Bay National Wildlife Refuge
Proposed Public Use Facilities and Trails

Map A-2



Back Bay National Wildlife Refuge

COMPATIBILITY DETERMINATION

USE: White-tail Deer and Feral Hog Hunting

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

National Wildlife Refuge System Administration Act of 1996, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 6688dd, et seq.)

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is the use? Is the use a priority public use?
The use is white-tail deer and feral hog hunting. Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where would the use be conducted?
Eight hunting zones (Map A-3) totaling 2,094 acres are open for public hunting. Seven of the zones are adjacent to the oceanfront; six of these are south of the maintenance compound and one north of the office/Visitor Contact Station. The first zone is on Long Island in Back Bay. Habitats of hunted areas include 1,037 acres of open marsh, 284 acres of forested habitat, and 686 acres of Long Island fields, forest, and open marshes.

We will expand deer hunting opportunities on the North and West sides of the Refuge on 1,394 acres. Deer and hog hunting opportunities will be provided at the following locations (Map A-4):

- Sandbridge Beach area, north and south of Sandbridge Road on Tracts 101d, 102, 103, 104, 104a, 104b, 106, 108b, and 110. Parking would be provided at the old tower pad on Tract 107, on Tract 106b, and we would coordinate with the City of Virginia Beach for possible parking at the Sandbridge Fire Station and along the utility right-of-way adjacent to Tract 106b;
- Sandbridge Road at the "old hunt club" on Tract 104b. This portion of Tract 104b has an existing road and parking area on site.
- Sandbridge Road at the "reforestation site" on Tract 125a. This area has an existing road and parking area on site.
- Colchester Road on Tract 150. This area has an existing road and parking area on site.
- At the end of Banks Lane on Tract 127a (bow only). Parking would be provided on federal property at the end of Banks Lane;
- Muddy Creek Road on Tracts 163, 166, and 169 (bow only). Parking would be provided on federal property on Tracts 163a and 166;
- Muddy Creek Road at Pleasant Ridge Road on Tract 194, with parking on site.

(c) When would the use be conducted?
The State determines hunting seasons annually, usually beginning October 1 and ending in early January. The deer and hog hunt on the barrier spit of the Refuge is usually conducted for up to 7 days in October; currently split between four days the first week, with the three remaining days occurring two weeks later. The Refuge evaluates the hunt on an annual basis, and may slightly reduce or increase the hunt to consider factors such as species and hunter numbers, as well as habitat impacts.

New hunting zones proposed in the CCP will be established in two phases in order to accomplish existing habitat management objectives. Once established upon completion of the CCP, each new zone will be open approximately 3-5 consecutive days in each of October, November, and December, in accordance with VDGIF season dates, unless safety or overriding resource concerns would make hunting incompatible. The Refuge will annually evaluate the hunt to consider resource conditions related to hunting.

Within 3 years of CCP completion the following zones are planned to be open:

- Sandbridge area, north and south of Sandbridge Road on Tracts 101d, 102, 103, 104, 104a, 104b, 106, 108b, and 110.
- Banks Lane on Tract 127a (bow only).
- Muddy Creek Road on Tracts 163, 166, and 169 (bow only).
- Muddy Creek Road at Pleasant Ridge Road on Tract 194.

10 years after CCP completion the following zones are planned to be open:

- Sandbridge Road at the "old hunt club" on Tract 104b.

- Sandbridge Road at the "reforestation site" on Tract 125a.
- Colchester Road on Tract 150.

(d) How would the use be conducted?
The Refuge permits hunting within state guidelines in compliance with a hunt program that we adjust each year to ensure safety and good wildlife management. Hunt season dates, limits and/or number of hunters per day are adjusted as needed to achieve balanced wildlife population levels within carrying capacities. (There are no limits or quotas on feral hogs, as these are considered a nuisance species). Back Bay National Wildlife Refuge has held an annual deer hunt since 1986. The deer and feral hog hunt program is a cooperative effort with the State of Virginia Department of Game and Inland Fisheries (VDGIF), the State Department of Conservation and Recreation, False Cape State Park (FCSP), and a contractor who administers the lottery system to which hunters apply.

Through the lottery process it allows the hunters to select the day and zone of their choice. If they do not get selected for this specified day and zone, the option of "any day or zone" can be selected as an alternative. Rules and regulations are posted on the Cyberdata website along with maps. This site also allows the hunter to purchase the required state hunting license. Hunter's can access Cyberdata through VDGIF and Back Bay NWR websites. Paper applications provided by VDGIF are also available at sporting goods stores as well as a local vendors. Upon applying by website or pamphlet, the newly adapted "Buddy System" allows a hunter to bring someone with them to hunt. On each hunt day, a maximum of 62 hunters are allowed to hunt within the eight identified hunt zones (2,094 acres). If these slots are not filled, the stand-by hunter (hunters that did not get selected through the lottery system) along with a "Buddy" are then selected through a lottery system conducted on the Refuge. Stand-by hunters can then choose the remaining slots available.

This existing hunt is highly managed by Refuge and FCSP staff, and volunteers. On each day of the hunt, upon registration, a signed rules and regulations confirmation sheet is turned in and a permit is issued to each hunter. A hunter safety orientation is provided and then the hunters are shuttled to their designated zones. In cooperation with False Cape State Park, hunters are picked up every hour and return to the registration station for data collection on harvested game and check out.

Expansion of the deer hunt will also be administered as a lottery hunt, in cooperation with VDGIF and the existing contract with Cyberdata to which hunters will apply (see above). However, the hunt will not be highly managed daily by staff, like the existing hunt. Forty-four hunters will be allowed to hunt the new zones, which is approximately two hunters per 50 acres (including the "Buddy"). Hunters applying to hunt the new zones can select a preferred zone and month to hunt. Selected hunters will be permitted to hunt all allowable days (3-5 to be determined at a later date) within their selected month. There will be no stand-by hunters permitted. In the selection notice, the hunters will receive their permit, which shall be carried at all times, parking pass, regulations, and harvest data card. Hunters will park in the area assigned to their selected zone, with their parking pass placed on the vehicle dashboard. Hunters will be required to return the signed regulations and harvest data card to a designated drop box in order for the Refuge to collect hunter effort and harvest data. If selected hunters do not return the required information, those individual will be ineligible for the lottery the following year.

Signage will be posted along all hunt zone boundaries. Refuge law enforcement as well as state law enforcement would ensure that all hunters follow State and Refuge regulations. No "drive-hunting" will be allowed – only still-hunting would be permitted. Dogs are not allowed when hunting deer and feral hogs. In addition, no rifles or crossbows will be allowed – shotguns are allowed.

(e) Why is the use being proposed?
Annual hunting of white-tailed deer is often necessary to minimize population growth due to the species' high reproductive potential. The presence of an established deer herd in poor (barrier island) habitats at Back Bay NWR requires hunting of the herd because of the poor soils and very limited forage. This herd has been hunted since 1986; an approach that has since maintained a constant population size, healthy individuals, and minimized habitat damage. Non-native feral hogs root in soft wetland soils, eating the roots and tubers of waterbird food-plants and decreasing the quantity and quality of plant material available to native animals and migratory waterfowl. Hog rooting along dike slopes increases the potential for erosion. Additionally, hogs would opportunistically eat birds, nestlings, reptiles, amphibians and small mammals.

Providing additional hunting in the new hunt zones is primarily for habitat management purposes. Wildlife biologists generally agree that any deer herd needs to be hunted to properly manage habitats and retain disease-free or otherwise healthy deer. Habitats subject to deer damage include forest under story and shrub habitat that migratory songbirds depend on for food resources. Heavily-browsed vegetation leaves less food and cover habitat for neotropical migratory birds. Reducing browse would also provide additional food and cover for species such as small mammals, reptiles and invertebrates.

Due to the rise in development, deer populations have encroached on residential areas as well as damage crops from local farmers who live adjacent to the Refuge property. Providing a hunt will support one of the "Big 6" activities in the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57) and, if compatible, is to receive enhanced consideration in refuge planning. Controlled hunting keeps the deer population within a healthy carrying capacity of the habitat.

AVAILABILITY OF RESOURCES:

Back Bay NWR incurs the bulk of the cost for implementing the hunt program in staff time to administer the hunt each day and to coordinate with our partners. Staff costs have been reduced greatly since partnering with VDGIF to administer the lottery process, which is no cost to the Refuge. To expand hunting to the new zones, there will be start-up costs to clear parking areas and post signs; however, this cost (included below) is within the existing budget and staff resources of the Refuge. Costs associated with administering this use include:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist - 6 weeks/yr. = **$9,600**
- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist – 6 weeks/yr. = **$9,600**
- Deputy Refuge Manager (GS-13) – 1 week/yr. = **$1,875**
- Refuge Manager (GS-14) - 1 week/yr. = **$2,088**

- Law Enforcement Officer (GS-09) - 1.5 weeks/yr. = **$1,575**

- Maintenance Worker (WG-10) - 3 weeks at start-up of new hunt zones = **$2,850**; 1 week/yr. thereafter = **$950**

In addition volunteer hours ranging from 50 to 60 hours contributing approximately $1,000.00.

Anticipated Impacts of the Use: The purposes of the Refuge is to provide habitat for migrating wintering waterfowl, particularly greater snow geese, to protect wetlands, preserve habitat for water birds, and improve water quality in Back Bay. Conducting the hunt will not impact waterfowl use of the high quality habitat found in the impoundments or adjacent marshes. Populations of most migratory birds are low at this time of the year. Some disturbance occurs to waterfowl, but it is offset by the benefits of a healthy deer herd that is smaller and is not consuming large quantities of waterfowl food plants. Disturbance to endangered species has not been noted at the refuge. A Section 7 consultation was prepared and approved on the hunt program in 1985.

Habitats subject to deer damage include forest under story and shrub habitat that migratory songbirds depend on for food resources. Heavily-browsed vegetation leaves less food and cover habitat for neotropical migratory birds, a trust resource which the Refuge is charged with protecting. Controlled hunting keeps the deer population within the carrying capacity of the habitat.

Modifying the hunt program to further reduce the deer population would then reduce the browse effects on vegetation. This would enable the forest understory to grow and produce more food and cover for neotropical migrants. It would also provide additional food and cover for species such as small mammals, reptiles and invertebrates.

Some wildlife disturbance and trampling of vegetation would occur from deer and hog hunters walking around in their zones. During the hunt, the Refuge is completely closed to public use. This causes some conflicts with other users; however, benefits are greater by keeping a healthy deer population. Expansion of the hunt will increase the time some visitors would be unable to use the refuge, although the losses of these visitors during some days from October to December may be offset by increased visitation with hunters. Shotgun noise from hunting could cause some wildlife disturbance. Hunting provides game meat and recreation for hunters. Hunters who come from outside the local area may contribute to the local economy by staying at local hotels and eating in local restaurants.

PUBLIC REVIEW AND COMMENT:

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The hunt program is 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 feral hog hunts would be reviewed annually to ensure the program is providing a safe, high quality hunting experience for participants. The Annual Hunt Plan must be approved by Regional Office supervisors. Hunt season dates, limits and/or number of hunters per day would be adjusted as needed to achieve balanced wildlife population levels within carrying capacities.

To mitigate user conflicts that arise when we close the Refuge to other public use, we would issue news releases and post information at the Visitor Center to notify visitors of closings. We maintain safe deer and feral hog hunts by limiting the number of hunters per zone and by establishing a buffer zone around Refuge residence buildings.

JUSTIFICATION:

Hunting is a wildlife-dependent priority public use with minimal impact on Refuge resources. Hunting is consistent with current Service policy on hunting, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Hunting will not materially interfere with or detract from the purposes of the refuge or the mission of the National Wildlife Refuge System. The Refuge currently is meeting deer management and visitor services objectives on the barrier spit by providing this hunt. Hunting in new zones is needed to meet those same objectives on other areas of the Refuge. This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection.

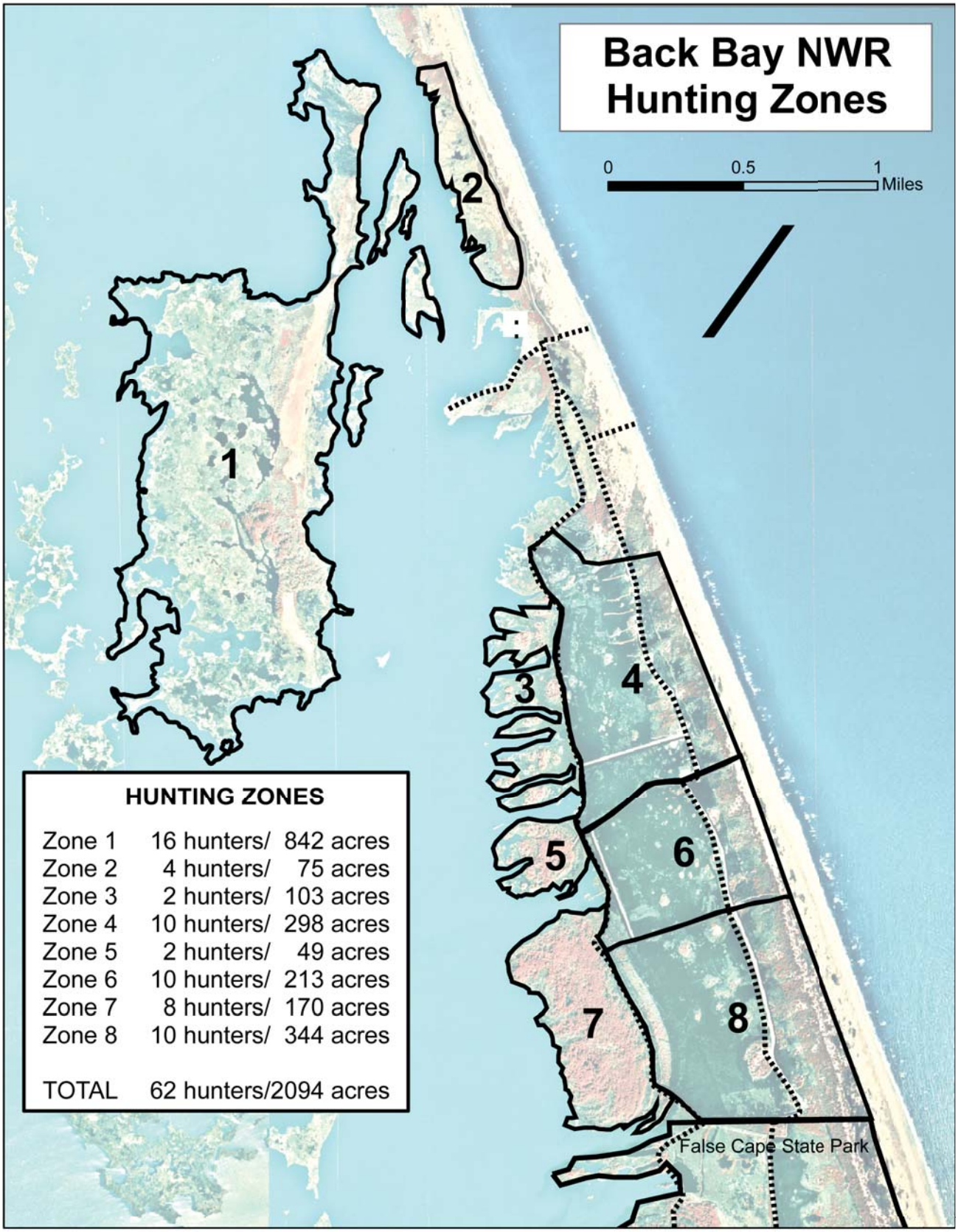
Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

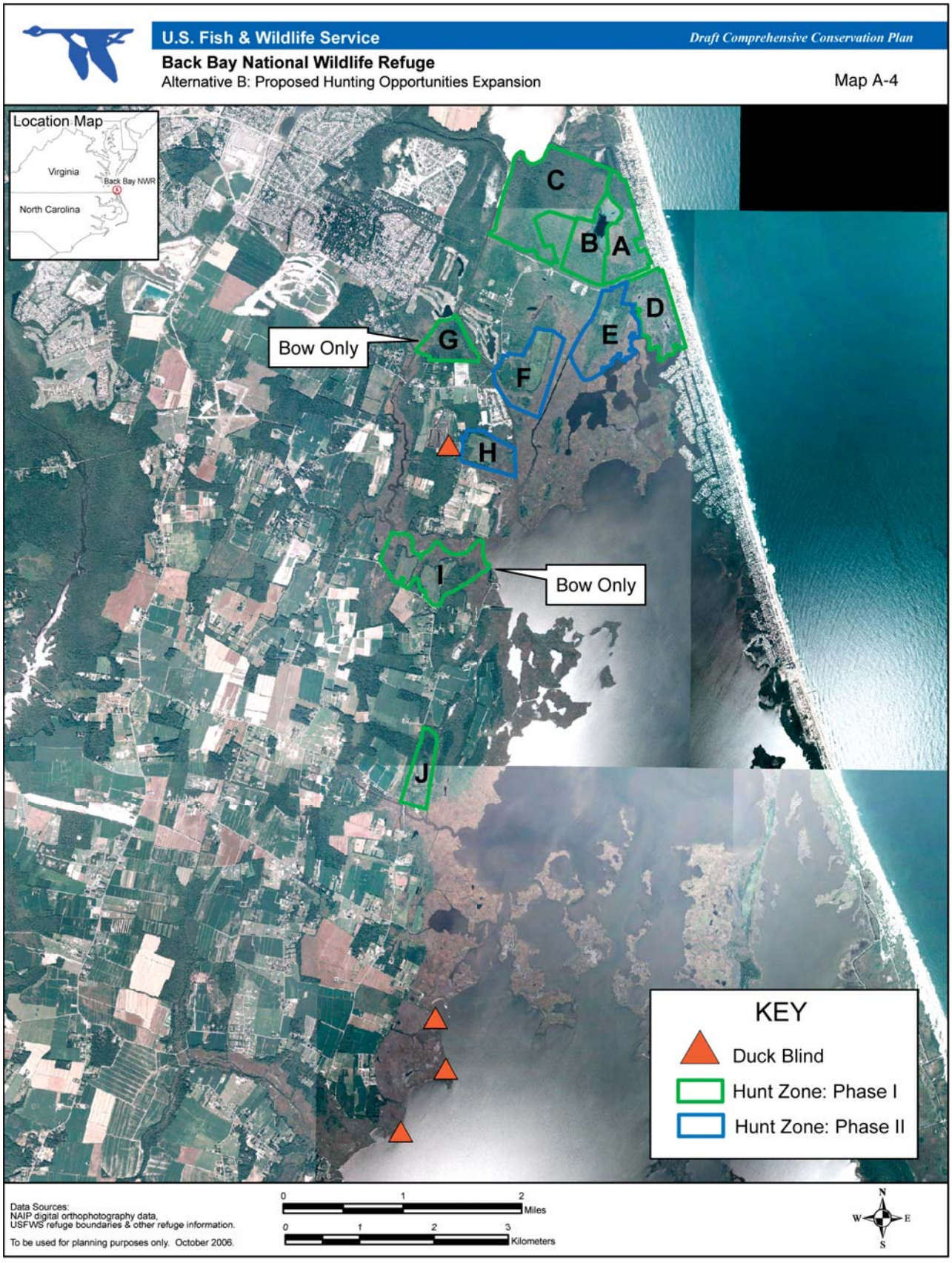
Mandatory 15-year re-evaluation date: 09/16/2025
(Date)

Compatibility Determination - White tailed Deer and Feral hog Hunting

Map A-3



Back Bay NWR GIS Lab, June 2006



Back Bay National Wildlife Refuge

COMPATIBILITY DETERMINATION

USE: Waterfowl Hunting

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

National Wildlife Refuge System Administration Act of 1996, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 6688dd, et seq.)

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is waterfowl hunting. Waterfowl hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
There is a waterfowl hunting program in two areas within the Refuge. One waterfowl hunting area is Redhead Bay, located south of the Presidential Proclamation area. There are three sites within this area, located on Back Bay at Tracts 229, 217, and 214-I. The second waterfowl hunting area is the Frank Carter impoundment on Colchester Road (Map A-5). We also provide support for a waterfowl hunt at False Cape State Park by providing parking on the Refuge.

(c) When would the use be conducted?
Waterfowl hunting opportunities in Redhead Bay is allowed Opening Day, Monday, Wednesday, Saturday, and some holidays during the State-designated seasons. Actual season dates change annually, but typically run from September through March. This schedule coincides with the existing State-administered waterfowl hunting program on Back Bay (Attachment A.1). At the Frank Carter impoundment, an annual one-day, youth waterfowl hunt occurs on the State-designated date within the season. Hunting is allowed from ½ hour before sunrise until 1:00p.m.; except during the snow goose season, which is until sunset, and unless safety or overriding resource concerns would make hunting incompatible.

(d) How would the use be conducted?
This hunting program is administered according to State, Federal, and Refuge regulations. At Redhead Bay, the three locations are designated by a ground stake that accommodate temporary (i.e. float/boat) waterfowl hunting blinds. The youth hunt at the Carter impoundment would involve constructing one stationary blind for hunters. These hunt blind locations are incorporated into the managed/quota waterfowl hunt programs administered by the VA Department of Game and Inland Fisheries (VDGIF). See attachment A.1 for specific information on their programs. Hunters register to hunt these blinds through VDGIF and receive a selection notice permitting them to hunt these areas. Hunters are allowed a specified number of companions (2 to 4). Law enforcement personnel conduct official checks to ensure compliance with all regulations.

Dogs are allowed during waterfowl hunts for retrieval purposes to reduce crippling loss.

(e) Why is this use being proposed?
There is a tremendous amount of waterfowl hunting history in Back Bay; however, waterfowl hunting was prohibited on the original Refuge boundary by Presidential Proclamation in 1939. Hunting is a priority public use under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. This use is being proposed because it provides new and additional public use opportunities on the Refuge without conflicting with the Refuge purpose.

AVAILABILITY OF RESOURCES

Implementing this proposed hunt program is within the resources available in our station budget because our partner agency, VDGIF, are administering the majority of the program. Refuge staff coordinate and participate in interagency meetings to establish the program and assist in constructing the stationary blind at the Carter impoundment. Conducting compliance checks is within the regular duties of the Station Law Enforcement Officer. Anticipated start-up and annual costs are as follows:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (coordinate with State,

assist implementation, etc.) - 1 week start-up = **$1,600**; 2 days/yr. after start-up = **$650**

- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (coordinate with State, assist with implementation, web site, etc.) - 1 week start-up = **$1,600**; 2 days/yr. after start-up = **$650**
- Deputy Refuge Manager (GS-13) (review proposals, budgeting, housing and vehicle coordination, etc.) - 2 days start-up = **$750**
- Refuge Manager (GS-14) (coordination, etc.) - 2 days start-up = **$830**
- Maintenance Worker (WG-09) (construct and maintain blind) - 2 weeks start-up = **$1,900** startup; 1 week/yr. after start-up = **$950**
- Law Enforcement Officer (GS-09) (enforcement patrols) 2 weeks/yr. = **$2,100**

ANTICIPATED IMPACTS OF THE USE

There will be minimal trampling of emergent vegetation and bottom substrates in and around the blinds. Unethical hunters pose the risk of increased litter, and could cut vegetation to make blinds and pollute waters by shooting unapproved lead shot. There will be no significant impact on waterfowl population levels, as sustainable harvest rates are pre-determined by Federal law. Dogs allowed for retrieval purposes to reduce crippling loss will be under the control of the hunter, thus reducing the chance to injure or harass non-target wildlife species, and will therefore not diminish the quality of experience for other visitors or hunters. At the Carter impoundments, this use may pose a conflict with adjacent landowners due to early morning gunfire.

Duck hunting has the potential of impacting other waterfowl, shore birds, marsh birds, and other migratory bird populations feeding and and/or resting near the designated area(s). Human disturbance to migratory birds has been documented in many different locations. The presence of hunters will decrease nesting behavior and increase alert and escape behavior for some of these various species.

Under this action, Back Bay NWR estimates a maximum additional 30-45 ducks, and 15-25 geese will be harvested each year. This harvest impact represents less than one-tenth of a percent of Virginia's average harvest. Liberal duck seasons (75 days, 5 bird bag limit) and resident goose seasons have resulted in high waterfowl harvests in Virginia during the past several years. Harvest has averaged ~150,000 ducks and ~60,000 geese from 2000 - 2005, compared to 115,000 ducks and 25,000 geese during the 1990's (USFWS. 2007. Migratory bird hunting activity and harvest during the 2005 and 2006 hunting seasons: Preliminary estimates. http://www.fws.gov/migratorybirds/reports/reports.html). The long season length and liberal bags offer greater opportunity and a greater cumulative harvest over the course of the season.

Opening Refuge lands to public use can often result in littering, vandalism, or other illegal activities on the Refuge. Focused law enforcement patrols during hunting season help to mitigate this possibility.

The positive impact provides additional hunting opportunities, especially to youth hunters, and for the first time for waterfowl hunters.

Impacts may be minor when we consider them alone, but may be important when we consider them collectively. Our principal concern is repeated disruption of nesting, resting, or foraging birds, and public safety concerns related to firearms use when hunting. Our knowledge and observations of the affected area(s), and of properly managed hunting activity shows no evidence that this activity will adversely affect the wildlife resource. Although we do not expect substantial cumulative impact from this activity in the near term, it will be important for the Refuge staff to monitor this use, and, if necessary, respond appropriately to conserve high quality wildlife resources.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

All Federal, State, and Refuge regulations must be followed by all hunters. This waterfowl hunting opportunity is only compatible if administered in cooperation with VDGIF because the Refuge does not have the staff to administer the program alone.

JUSTIFICATION

Hunting is a priority public use. Waterfowl hunting has not been allowed on Back Bay NWR because of Presidential Proclamation in 1939, one year after the Refuge was established. With additional bay-front property acquired, outside the Proclamation Boundary, providing waterfowl hunting opportunities is now possible. VDGIF is very supportive of this proposal and will administer 90% of the program. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established. This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 15-year re-evaluation date: 09/16/2025
(Date)

ATTACHMENT A.1

Draft Virginia Department of Game and Inland Fisheries
Waterfowl Hunting Programs (with edits to include Back Bay NWR)

http://www.dgif.virginia.gov/hunting/managedhunts/

Princess Anne WMA Float Blind September Canada Goose/Teal Hunts and October Waterfowl
Hunt September Canada geese/teal and waterfowl (during the October waterfowl season) on the designated waters of Back Bay in Virginia Beach. The area's 51 float blind stakes are available to float blind hunters on a first come, first served. Hunters are not allowed to tie float blinds to stakes before 5:00 AM. Half-day (until 1:00 PM) hunting allowed on Opening Day, Mondays, Wednesdays, Saturdays and State Holidays. It is recommended that each hunting party visit the hunting area prior to the season to locate boat access, blind stakes, and scout the area in general. You must be familiar with the area to locate the blind stakes before shooting time. Dogs are allowed and recommended.

- **Hunt days:** Opening Day, Mondays, Wednesdays, Saturdays and State Holidays.
- **Hunt dates:** Refer to above web site for specifc hunt dates.
- Hunters may not tie up to blind stakes until 5:00 AM.

Princess Anne WMA Late Snow Goose Hunts
This is an opportunity for float blind hunters to hunt snow geese on the designated waters of Back Bay after the general duck season. The blind stakes in Back Bay are available for snow goose hunting after the general duck season. These hunts will be permitted after the general duck season and will be on a first come, first served basis. Daily hunting times will be ½ hour before sunrise to sunset.

- **Season dates:** Refer to above web site for specific hunt dates.

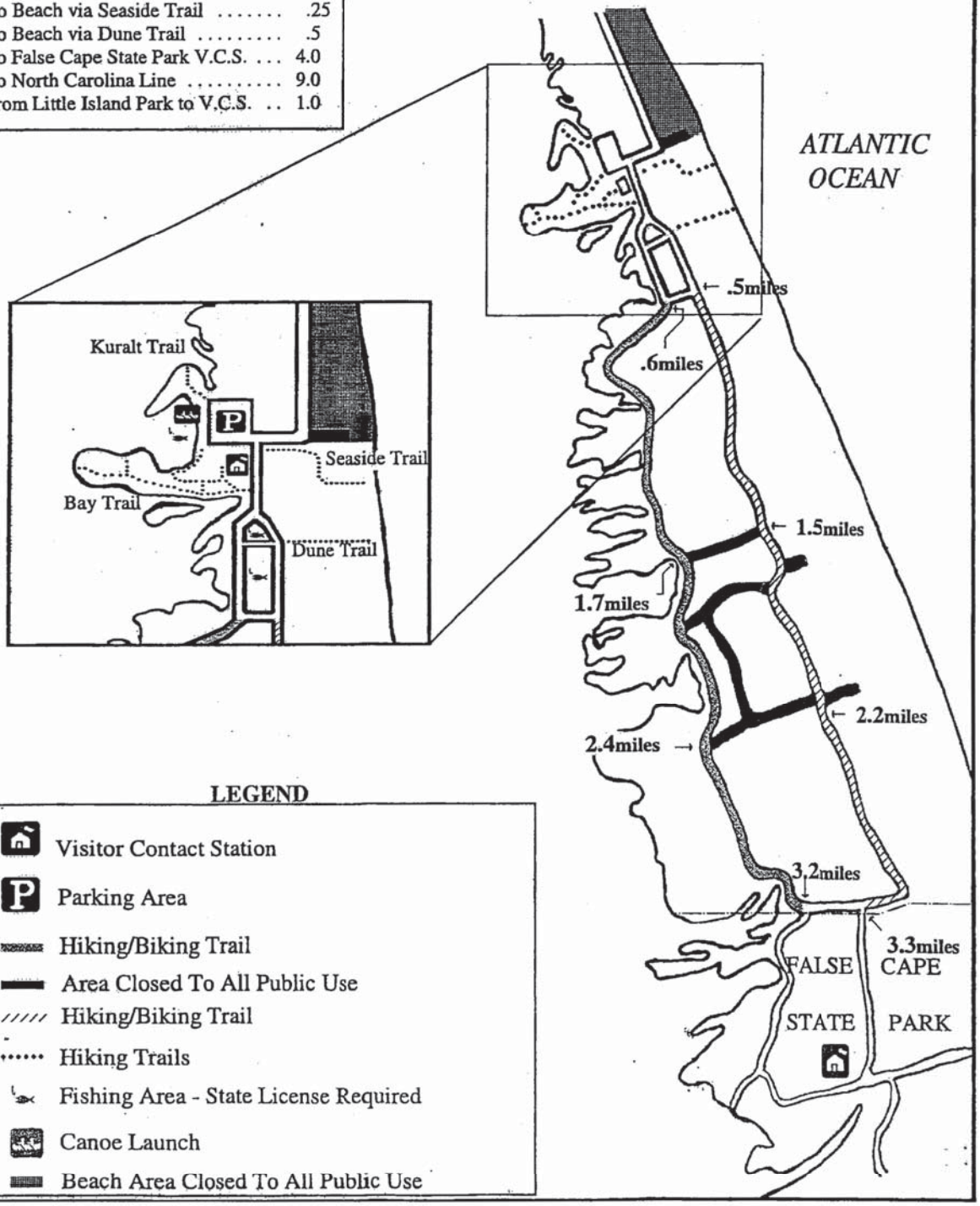
Back Bay NWR - Youth Waterfowl Day
This is an opportunity for youth to hunt waterfowl at the Carter Impoundment on Back Bay NWR. The Service, in cooperation with VDGIF, will host a youth waterfowl hunting day annually during the month of October Only youths may hunt and carry a firearm, and must be accompanied by a legal guardian. All youth hunters are to be registered for this event. To register, contact Back Bay NWR at 757-721-2412. There are no decoys provided for these hunts. Dogs are allowed and recommended for retrieval purposes.

Back Bay National Wildlife Refuge

Map A-5

One-way Mileage from V.C.S.

End of Bay Trail	.4
To Beach via Seaside Trail	.25
To Beach via Dune Trail	.5
To False Cape State Park V.C.S.	4.0
To North Carolina Line	9.0
From Little Island Park to V.C.S.	1.0



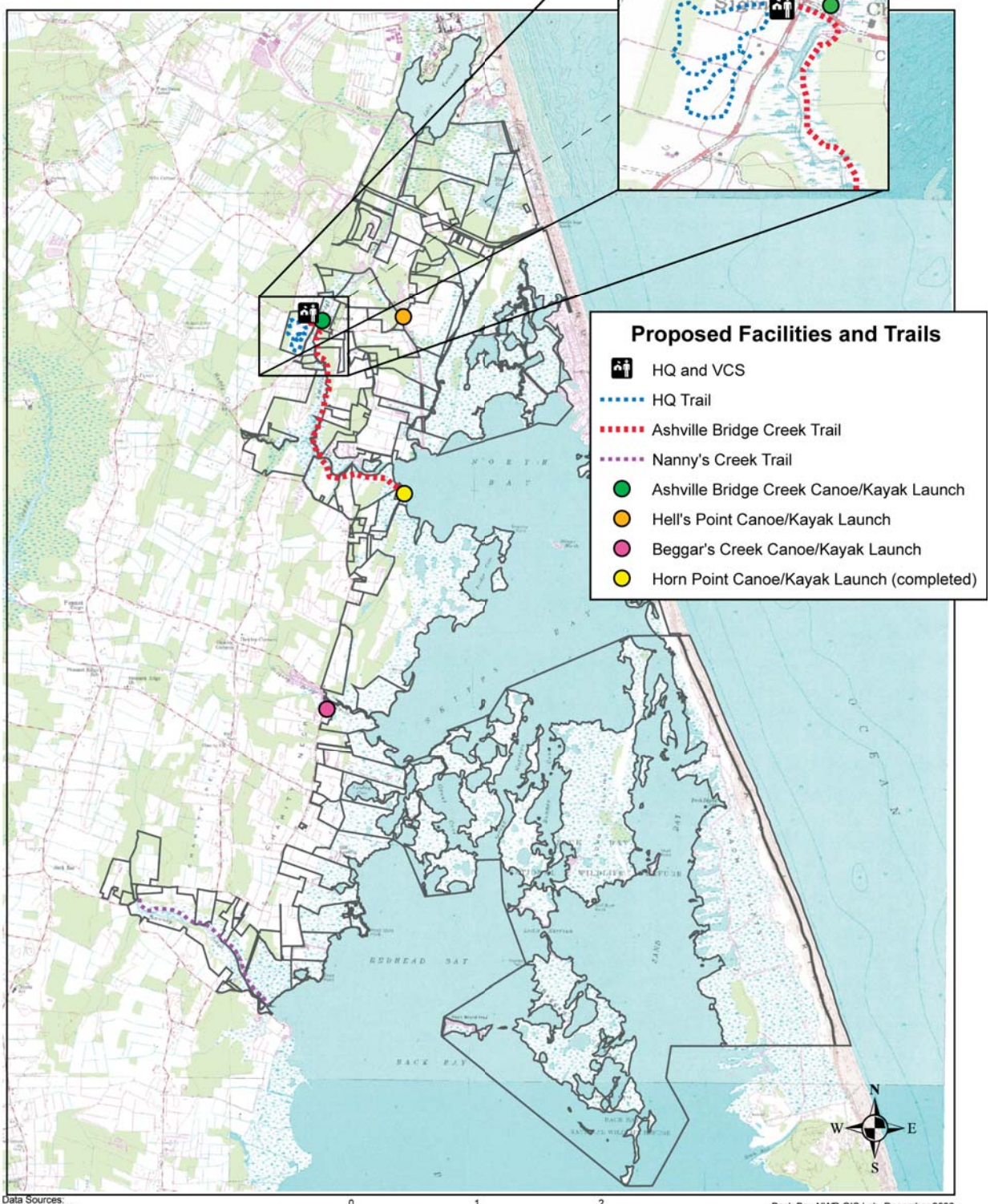
Back Bay National Wildlife Refuge

Compatibility Determination – Operation of Visitor Contact Station and Public Parking

Draft Comprehensive Conservation Plan

Back Bay National Wildlife Refuge
Proposed Public Use Facilities and Trails

Map A-6



Draft Comprehensive Conservation Plan & Environmental Assessment

COMPATIBILITY DETERMINATION

USE: Freshwater and Saltwater Fishing and Crabbing

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

National Wildlife Refuge System Administration Act of 1996, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 6688dd, et seq.)

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… The conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is fresh and saltwater fishing and crabbing, which is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Fishing and crabbing occurs on the Refuge at the designated fishing area in Back Bay, which is in front (west) of the headquarters, along the beach (excluding the North Mile closure area), and in D Pool.

Fishing will be permitted at the Horn Point Canoe/Kayak Launch Site, located on Horn Point Road, on the west side of Back Bay. In addition, future lands acquired and deemed appropriate for recreational fishing will be evaluated for compatibility by amending this determination.

Fishing/Crabbing is prohibited in the Refuge impoundments south of the maintenance compound, from the dikes into Back Bay in that same area, and from any other Refuge property.

(c) When would the use be conducted?
The Refuge is open to public fishing/crabbing in the above designated area, including the future Horn Point site, during standard Refuge hours of one-half hour before sunrise to one-half hour after sunset. The Refuge also participates and promotes two "Kids Fishing Days Events" annually; one in April and one on the first Saturday in June to support National Fishing and Boating Week.

The Refuge will allow individuals to night-time surf fish on the beach, under a Special Use Permit. Although select weeks will be permitted, this use will be restricted to the months of October through February. All participants will be required to enter the Refuge prior to closure of the entrance gate, around sunset, and hours of fishing will also be restricted in accordance with available staff resources (proposed until 12:00 midnight or 2:00 a.m.). Night-time surf fishing will not be allowed unless and until the Refuge's current access regulations as expressed in 50 CFR 26.34 are changed to permit such access.

This use will not be allowed unless and until the Refuge's current access regulations as expressed in 50 CFR 26.34 are changed.

(d) How would the use be conducted?
Visitors are free to fish/crab in designated areas as this activity is deemed wildlife oriented and is promoted within the U.S. Fish and Wildlife Service, nationwide. Visitors are required by Virginia regulations to maintain a current fishing license (unless exempt), except for the "Virginia Free Fishing Weekend," and follow all Virginia fishing/crabbing regulations. The Refuge may impose stricter regulations as deemed necessary to maintain fish populations on Refuge lands.

While the Refuge allows fish to be removed from these areas, catch and release is promoted by many of the fisherman using these areas. Visitors would supply their own fishing/crabbing gear, bait, and access to the open areas. The special Kids Fishing Day events are administered in cooperation with the State of Virginia, the local chapter of the Izaak Walton League and other local vendors.

The night-time surf fishing activity will be controlled through conditions listed on a required Special Use Permit and through strict enforcement by Refuge staff. Each individual will purchase a permit for this use and produce it upon request when participating in this use. For safety purposes, only individuals 16 years of age and older can obtain a permit. Applicants under 18 shall have a legal parent or guardian apply for and sign the permit. Participants shall adhere to safety precautions outlined in the permit, particularly the use of a reflective vest or other suitable reflective material to be worn above the waist. Permitees of the beach Motor Vehicle Access Permit Program shall have priority use on the beach. Permits are subject to revocation for violation of the terms of the permit.

(e) Why is this use being proposed?
Fishing and crabbing is a current use on the Refuge and is an appropriate activity. Refuge expenses are very minimal aside from already existing standard law enforcement patrols to verify regulations are being followed. Also, our fishing events promote this wise use through environmental education and interpretation. This use supports wildlife dependent recreation as outlined in the Improvement Act.

Service policy (605 FW 3.6(G)) requires that if a Refuge is not generally open after sunset, the decision to allow night fishing must be based on specific refuge objectives and not just on historic use. Goal 6 of the Draft CCP/EA is to "provide and expand hunting and fishing opportunities to the public where compatible with Refuge purposes" and a stated objective in the Service-preferred alternative expresses that "within 5-7 years of CCP approval, expand high-quality fishing opportunities on the Refuge." Allowing night time surf fishing under the conditions specified above will increase high-quality fishing opportunities for the public and thereby help meet Refuge objectives.

AVAILABILITY OF RESOURCES

Permitting the general fishing/crabbing use is within the resources available to administer our Visitor Services Program. The funding received by the Refuge is adequate to continue to administer this program and to ensure that the use remains compatible with the Refuge purposes. The use of the area specified for fishing is a small area, where cost effective administration of the program can occur. Compliance with fishing regulations is handled within the regular duties of the Station Law Enforcement Officer. Anticipated additional costs for special fishing events:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) - 1/2 day/yr. = **$175**
- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (coordinate with entity, process) - 2 days/yr. = **$650**
- Refuge Manager (GS-14) (review and approval) – 1/4 day/yr. = **$104**
- Law Enforcement Officer (GS-09) (enforcement patrols) 1 day/yr. = **$208**

Implementing the night-time surf fishing will require additional resources, due to being highly managed. Back Bay NWR incurs the bulk of the cost in staff time to administer the use each day; however, this cost (included below) will be offset by each $35 use fee generated by this Program. Costs associated with administering night-time surf fishing include:

- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist – 4 weeks/yr. = **$6,400**
- Deputy Refuge Manager (GS-13) – 1 week/yr. = **$1,875**
- Refuge Manager (GS-14) - 1 week/yr. = **$2,088**
- Law Enforcement Officer (GS-09) - 4 weeks/yr. = **$4,200**
- Administrative Assistant (GS-06) – 1 week/yr. = **$900**

ANTICIPATED IMPACTS OF THE USE

While the day-to-day activity of fishing/crabbing is considered a consumptive use on the Refuge, there are still few adverse impacts from the use. While some fish/crabs are lost to the system, they are renewable resources that will be replenished. Additionally, it has been found the majority of people fishing in D Pool are catch and release fisherman. There is no significant impact on migratory birds due to the small number of fish that are removed from the Refuge through the public fishing program, and while fishing may cause other wildlife disturbances, these impacts are minimal and temporary.

Allowing night-time surf fishing could potentially impact migratory shore birds and nesting sea turtles. These impacts have been reduced for shorebirds and eliminated for sea turtles by restricting this use to periods outside the peak migration and nesting seasons, respectively. There is the possibility of increased disturbance to dune habitats; however, regular patrols and enforcement of this closed area will be implemented. No other adverse impacts are anticipated.

PUBLIC REVIEW AND COMMENT

A public notice of availability was issued soliciting public review and comment for 14 days. It was sent to the Virginia Pilot local newspaper, posted in the Visitor Contact Station, and submitted to various fishing interest groups. Four responses were received, all in support of the proposed fishing program.

In addition, the Refuge held a public meeting on the proposed night fishing activity on January 31, 2007. Further written comments were accepted until March 2, 2007. Forty-five (45) written comments were received with 37 in support of the new activity and five opposing. Comments from the opposing public include: the activity will interfere with the primary purpose of the Refuge, will divert resources, and cause security issues (3); will cause night public use issues such as fires, alcohol, firearms, litter, and wildlife harassment (2); and, will threaten dune protection and cause habitat erosion. Limiting impacts from these issues are addressed above.

DETERMINATION (CHECK ONE BELOW):

_____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Maintain closed areas which allow for migratory birds to still feed in closed impoundments. Do not allow motorized access for fishing except as designated for handicapped parking near D and E impoundments.

In addition to the above, the night-time surf fishing use will have many stipulations, including but not limited to:

- Each individual will purchase a permit for this use and produce it upon request when participating in this use.
- Only individuals 16 years of age and older can obtain a permit. Applicants under 18 shall have a legal parent or guardian apply for and sign the permit.
- Participants shall adhere to safety precautions outlined in the permit, particularly the use of a reflective vest, or other reflective item and lit lanterns.
- Permitees of the beach Motor Vehicle Access Permit Program shall have priority use on the beach.
- No dogs or other pets, alcohol, or campfires are permitted.
- All permitees must be actively fishing.

- No camping, cooking, tents, or any other structure except a beach chair.
- Distance from the surf line where participants can set up and fish will be stipulated in the Special Use Permit.
- Permits are subject to revocation for violation of the terms of the permit.

JUSTIFICATION

Fishing is an appropriate wildlife-dependent use of Refuge resources. It has been a long standing tradition in the Region, and while the Refuge does maintain areas open to public fishing and crabbing, it still maintains certain areas closed. These closed areas assist in providing the quality food source for migratory waterbirds that depend on the fish and crabs for survival.

The U.S. Fish and Wildlife Service and Back Bay National Wildlife Refuge promote fishing/crabbing as a viable wildlife oriented recreational activity. The Refuge also promotes this activity through two annual "Kids Fishing Day" events, which are in line with the environmental education and wildlife oriented recreational activities for today's youth. These days provide an opportunity to educate the children in how to fish, provide for an opportunity to learn about nature, the Refuge system, and enhance ethical fish behavior at a young age. This activity can also build or strengthen a bond between friends and family and enhance both individual's knowledge about the natural ecosystem provided and why it is important to protect them. Fishing opportunities, including nighttime surf fishing, will promote public appreciation and support for the refuge, and help achieve Refuge goals and objectives.

This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. We do not expect this use to materially interfere with or detract from the mission of the National Wildlife Refuge System, nor diminish the purposes for which the refuge was established. It will not pose significant adverse effects on Refuge resources, nor interfere with public use of the Refuge, nor cause an undue administrative burden.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 15-year re-evaluation date: 09/16/2025
(Date)

FINDINGS OF APPROPRIATENESS AND COMPATIBILITY DETERMINATIONS FOR THOSE SECONDARY USES FOUND TO BE APPROPRIATE

- Operation of Visitor Contact Station and Public Parking
- Walking/Hiking
- Bicycling
- Launching of Non-Trailered Vessels
- False Cape State Park Access (through Refuge)
- Biological Research
- Outdoor Events
- Ground Military, Police and Fire Training
- Commercial Filming/Photography
- Weddings and Other Ceremonies
- Parking and Connecting Access to Horseback Riding
- Cooperative Farming*

* *(this compatibility determination was approved on March 2, 2007)*

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Operation of Visitor Contact Station and Public Parking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Operation of Visitor Contact Station and Public Parking

NARRATIVE

Operation of the visitor contact station and public parking are a means to facilitate priority public uses of environmental education and interpretation (VCS operation), and wildlife observation and photography (parking). These uses directly support the mission of the FWS, NWRS and the Refuge, does not have negative impacts on the Refuge mission, and does not require additional resources to allow.

COMPATIBILITY DETERMINATION

USE: Operation of the Visitor Contact Station and Public Parking

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The uses are operation of the Visitor Contact Station (VCS) and public parking. VCS operation supports and provides opportunities for priority public uses (environmental education and interpretation), as identified in the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. Although vehicle parking in designated areas is not a priority public use, this activity also facilitates priority public use opportunities (wildlife observation and photography).

(b) Where would the use be conducted?
Refuge Barrier Spit (Northern/Public Use Zone) (Map A-6): This developed area comprises approximately 280 acres, and serves more than 110,000 visitors annually. This area includes a Visitor Contact Station (VCS) with 50-car visitor parking lot and wildlife viewing scopes, a canoe/kayak launch, and a fee collection station at the Refuge entrance. Future plans include relocation of the Refuge entrance station and additional parking at the entrance area for approximately 20 cars.

Refuge West Side (Map A-7): The Asheville Bridge Creek Environmental Education Center (ABCEEC) is a 1,800 square foot converted home on a 17-acre parcel that hosts group visitors on an appointment basis. It provides environmental education, interpretation, and parking for the indoor and outdoor classroom activities. The Horn Point Canoe/Kayak Launch Facility provides public parking for launching canoes/kayaks and for wildlife observation and photography. There is a parking area at the Frank Carter Impoundment on Colchester Road, which supports pedestrian activities.

We have future plans to construct a new Refuge Headquarters and Visitor Contact Station (HQ/VCS) on Tract #244 at the corner of Sandbridge Road and New Bridge Road; two thoroughfares that bisect the Refuge. The new facility will be a standard, medium-sized design of approximately 10,500 square feet. Located here will be a maximum 100-car parking lot. The facility will provide environmental education, interpretation, and interior and exterior interpretive displays. This proposed public use area comprises approximately 61.5 acres, and is expected to serve more than 150,000 visitors annually. Once the new facility is constructed, we also propose to convert a Refuge house (Tract #135) into an environmental education center and utilize the existing ABCEEC as a maintenance facility.

Three additional canoe/kayak launch sites are planned to be constructed on the west side, which will provide public parking to also facilitate wildlife observation and photography (Map A-7). These new sites are discussed in detail in a separate Compatibility Determination (see Boat Launching).

(c) When would the use be conducted?

Refuge Barrier Spit (Northern/Public Use Zone): Currently the VCS is open seven days per week from April 1 through October 31, and closed on Sunday between November 1 and March 31. Public parking is allowed year-round, one-half hour before sunrise to one-half hour after sunset. A temporary closure to these activities would be implemented during any scheduled Refuge hunt dates.

Refuge West Side: The ABCEEC site is for educational and other organized group visits, by reservation only, for the purpose of environmental education, wildlife viewing, and wildlife photography. Vehicle parking for pedestrian activities at the ABCEEC and the Frank Carter impoundment area are open year-round from one-half hour before sunrise to one-half hour after sunset. The Horn Point Canoe/Kayak Launch Site will be open from April 1 through October 31 annually, from one-half hour before sunrise to one-half hour after sunset. The new HQ/VCS on Tract #244 will follow the newly proposed hours of operation; seven days per week from April 1 through October 31 and closed on Sunday instead of Saturday between November 1 and March 31. The newly converted environmental education center on Tract #135 will operate the same as the current ABCEEC. Facilities on the west side would remain open during hunts, as they are not located near any hunt zones.

(d) How would the use be conducted?

Such activities are allowed in areas and in buildings that have been designed to accommodate such uses. These uses are conducted for the general public, as well as for organized groups, including schools and scout groups. Groups of 10 or more are required to have permission to visit the Refuge for these activities, and a seasonal entrance fee from April 1 through October 31 will be charged to all, with the exception of canoe/kayak launches, the Frank Carter impoundment area, and for school groups, scouts on merit badge projects assignments, or children under 16 years of age. There is a mix of personal and non-personal program delivery, including interpretive signing, audio-visual presentations, brochures, special events, guided walks and talks, exhibits, web site information, and informal visitor information contacts.

(e) Why is the use being proposed?
Vehicle parking facilitates use for participating in priority public uses. Public vehicle access is limited to the roads and parking areas that have been developed at the specific sites identified above. Future road and parking areas will be designed to maximize resource protection, while providing safe and convenient access to the visitor center. Creation of additional parking at the entrance station will accommodate parking for visitors or the public to observe wildlife and photograph. These visitors are often hikers and bikers.

AVAILABILITY OF RESOURCES:

The resources necessary to provide and administer these uses, at current use levels, is available within current and anticipated Refuge budgets. Staff time associated with administering this use is related to assessing and conducting parking and VCS maintenance, including kiosks, gates and signs, monitoring potential impacts of the use on Refuge resources and visitors, and providing information to the public about the use.

The Visitor Services Manager is available for public outreach. A Park Ranger will monitor visitor use and user interactions. The Park Ranger will conduct law enforcement activities to provide for visitor safety and resource protection. Maintenance staff performs the regular maintenance and repairs.

ANTICIPATED IMPACTS OF THE USE:

The presence of humans and cars has the potential of impacting shorebird, waterfowl, marshbirds and other migratory bird populations feeding and resting near the trails and on beaches during certain times of the year. Disturbing wildlife typically results in a temporary displacement without long-term effects on wildlife individuals or populations. Some species will avoid the areas people frequent, such as the parking areas and the buildings, while others seem unaffected by or even drawn to the presence of humans. Overall, those effects should not be significant.

Opening Refuge lands to this public use can often result in littering, vandalism, or other illegal activities. Our knowledge and observations of the affected areas show no evidence that these uses cumulatively will adversely affect the wildlife resource. Although we do not expect substantial impact from these uses in the near term, it will be important for Refuge staff to monitor those uses and, if necessary, respond to conserve high-quality wildlife resources.

Future parking at the newly proposed headquarters/visitor contact station site will be accomplished on a previously disturbed agricultural site. Creating additional parking at the entrance station will occur in an area that has already been developed primarily to accommodate priority public uses. Therefore, little wildlife value will be lost due to newly proposed construction projects.

PUBLIC REVIEW AND COMMENT:

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

No off-road or off-trail access will be permitted, except for emergency or administrative purposes, for the current motor vehicle access permit program for North Carolina residents, and for hunters.

Groups of 10 or more will be required to have permission to visit the Refuge for these activities, and a seasonal entrance fee from April 1 through October 31 will be charged to all, with the exception of school groups, scouts on merit badge projects assignments, or children under 16 years of age.

JUSTIFICATION:

These uses provide compatible educational and recreational opportunities for visitors to enjoy Refuge resources, and improve their understanding and appreciation of fish and wildlife, ecology, refuge management practices, and the relationship of plant and animal populations in the ecosystem. Refuge visitors will better understand the Service's role in conservation, and opportunities, issues, and concerns faced in management of our natural resources. Further, they will understand the impact that human presence, disturbance, and/or consumption can cause to these resources. Likewise, these uses will provide opportunities for visitors to observe wildlife habitats firsthand, and learn about wildlife and wild lands at their own pace in an unstructured environment. Authorization of these uses will result in a greater constituency for achieving Refuge goals, and, ultimately, the Service mission.

This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. We do not expect this use to materially interfere with or detract from the mission of the National Wildlife Refuge System, nor diminish the purposes for which the refuge was established. It will not pose significant adverse effects on Refuge resources, nor interfere with public use of the Refuge, nor cause an undue administrative burden.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

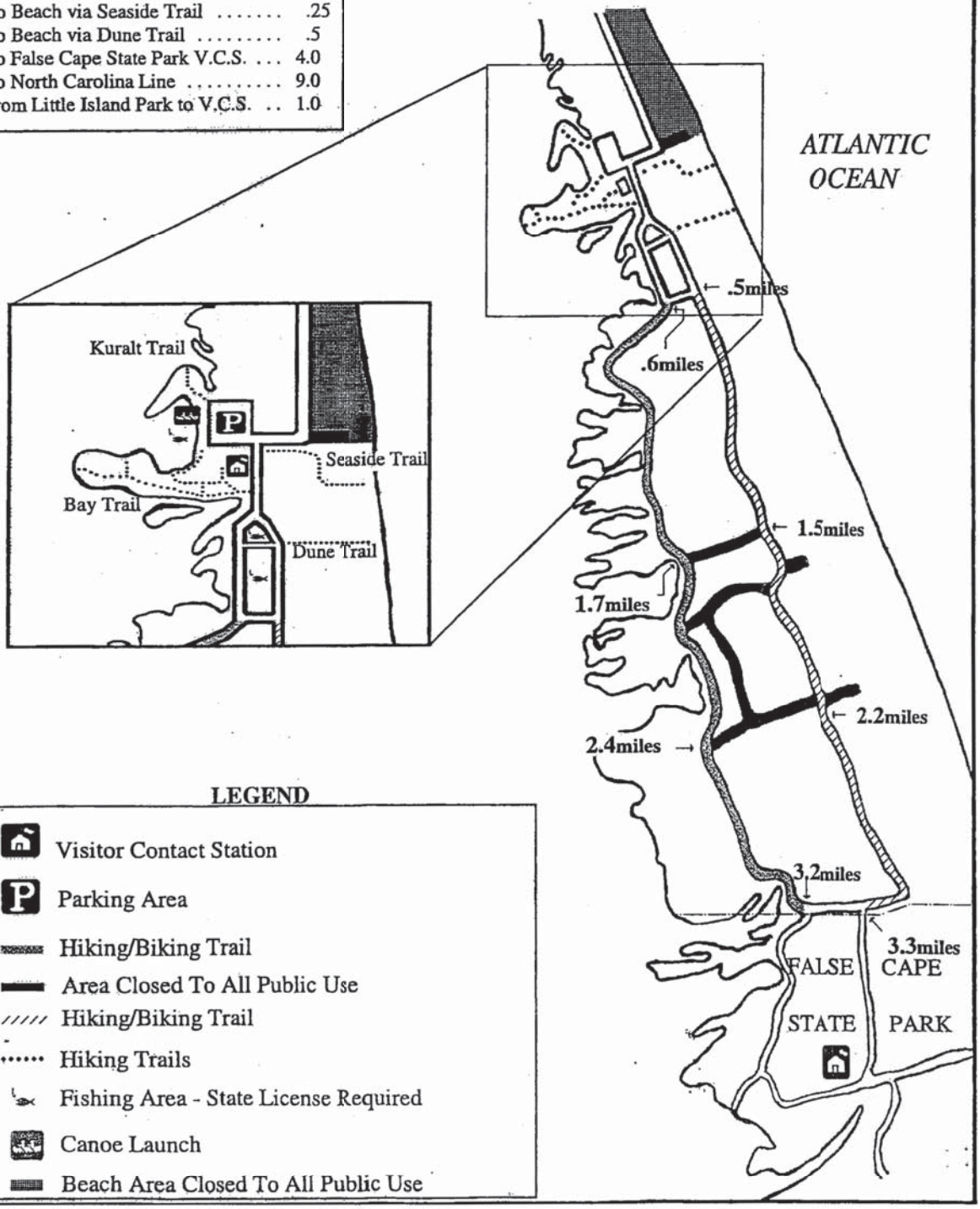
Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

Map A-7

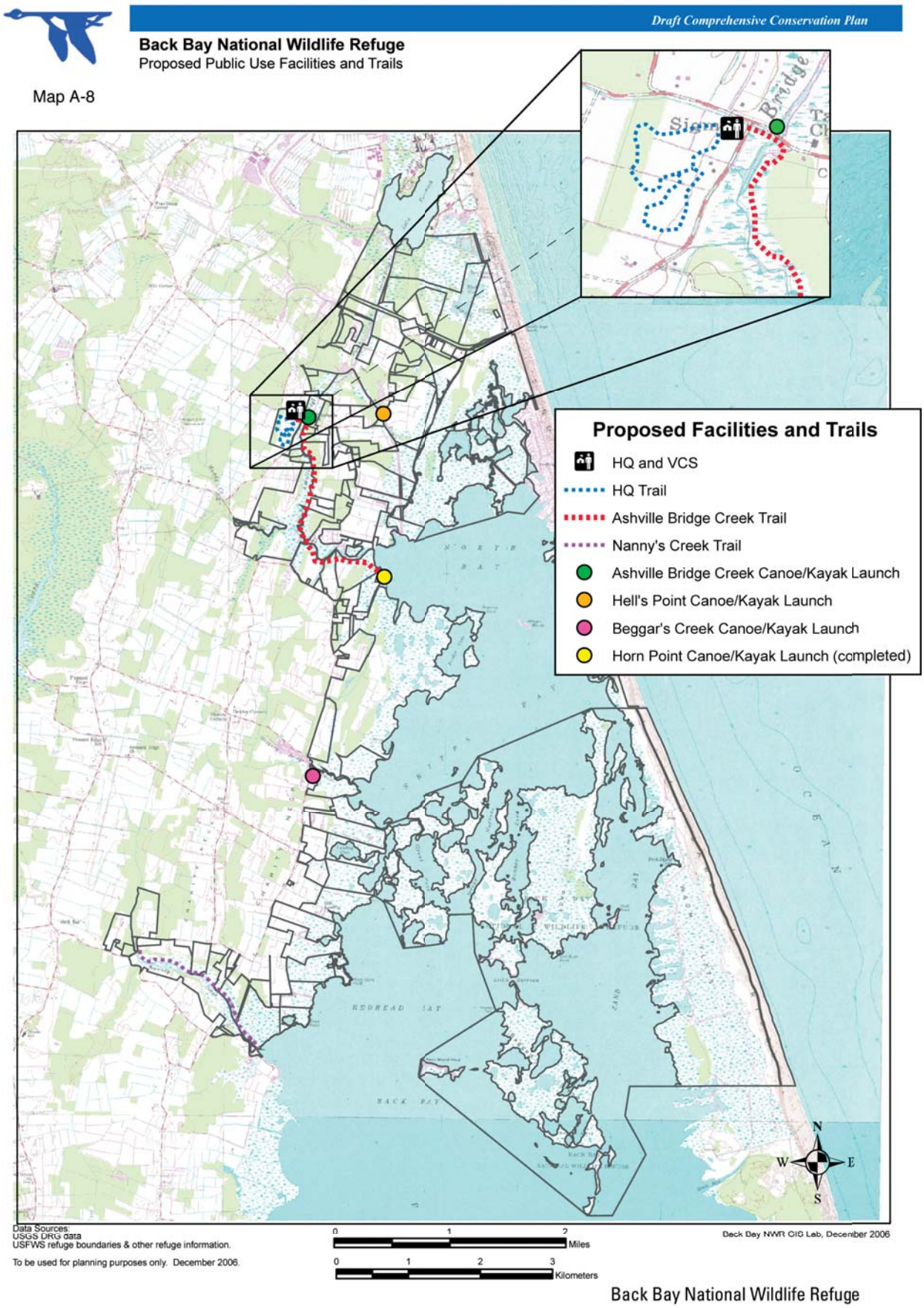
Back Bay National Wildlife Refuge

One-way Mileage from V.C.S.

End of Bay Trail	.4
To Beach via Seaside Trail	.25
To Beach via Dune Trail	.5
To False Cape State Park V.C.S.	4.0
To North Carolina Line	9.0
From Little Island Park to V.C.S.	1.0



Back Bay National Wildlife Refuge


Draft Comprehensive Conservation Plan
Back Bay National Wildlife Refuge
Proposed Public Use Facilities and Trails
Map A-8
Proposed Facilities and Trails
HQ and VCS
HQ Trail
Ashville Bridge Creek Trail
Nanny's Creek Trail
Ashville Bridge Creek Canoe/Kayak Launch
Hell's Point Canoe/Kayak Launch
Beggar's Creek Canoe/Kayak Launch
Horn Point Canoe/Kayak Launch (completed)
N
W
E
S
Data Sources:
USGS DRG data
USFWS refuge boundaries & other refuge information.
To be used for planning purposes only. December 2006.
0 1 2 Miles
0 1 2 3 Kilometers
Back Bay NWR GIS Lab, December 2006
Back Bay National Wildlife Refuge

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Walking/Hiking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Walking/Hiking

NARRATIVE

Walking and hiking are a means to facilitate priority public uses of wildlife observation and photography. Our dike roads and beach are suitable areas for these activities. Also, the 1997 MOU with Virginia Department of Conservation and Recreation states that the refuge allow public access to False Cape State Park, which is five miles south of the Refuge. Vehicles are not allowed through the Refuge, therefore, visitors must walk or hike. These uses do not have negative impacts on the Refuge mission and does not require additional resources to allow.

COMPATIBILITY DETERMINATION

USE: Walking/Hiking

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

Refuge Purposes

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The uses are walking and hiking. Although walking and hiking are not priority public uses, these pedestrian activities do facilitate priority public uses (primarily wildlife observation and photography) of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Refuge Barrier Spit (Northern/Public Use Zone) (Map A-8): This developed area comprises approximately 280 acres, and serves more than 110,000 visitors annually. For walking and hiking, this area includes a trail system, two boardwalks providing access to four miles of beach, wildlife viewing facility, viewing scopes, one-half mile of dike roads (gravel), and one mile of asphalt entrance road. Future plans include re-alignment of the entrance road with a parallel, multi-purpose trail. In addition, we will expand this zone for public use in order to access the newly constructed wildlife viewing facility located at the northern edge of the "C" Pool impoundment (see next paragraph).

Refuge Barrier Spit (Southern/Impoundment Zone) (Map A-9): Comprising more than 900 acres of restored wetlands, this section of the Refuge currently provides two dike roads that serve as pedestrian trails (7.2 miles) through the Refuge, and provides wildlife viewing and photography opportunity, as well as seasonal public access to False Cape State Park. Visitors must pass through the Refuge Barrier Spit, Northern Zone in order to access this area and/or the State Park. No public vehicle traffic or parking is permitted in this area. This area serves more than 20,000 visitors annually. Public access is allowed to the wildlife viewing facility at the northern edge of "C" Pool (see section "c" below).

Refuge West Side (Map A-9): The Asheville Bridge Creek Environmental Education Center (ABCEEC) provides pedestrian activities via a short self-guided interpretive trail and a wildlife viewing/activity pier. The Frank Carter Impoundments on Colchester Road provide for pedestrian activities (1.4 miles) and has a wildlife viewing platform.

We will construct two multi-purpose trails; one on Tract #244 at the corner of Sandbridge Road and New Bridge Road, and the other to be along the east side of Asheville Bridge Creek to the Horn Point Public Access Site. The former would be in conjunction with the newly proposed headquarters/Visitor Contact Station (HQ/VCS) (see Compatibility Determination titled "Operation of VCS and Public Parking").

(c) When would the use be conducted?
Refuge Barrier Spit (Northern/Public Use Zone): Year-round, one-half hour before sunrise to one-half hour after sunset. A temporary closure to these activities is implemented during any scheduled Refuge hunt dates.

Refuge Barrier Spit (Southern/Impoundment Zone): Open to pedestrian activities seasonally, from April 1 through October 31, from one-half hour before sunrise to a one-half hour after sunset. The Southern Zone oceanfront beach remains open to these activities year-round, except on scheduled public hunt dates.

These impoundments provide undisturbed resting and feeding for migratory waterfowl during the winter months; therefore they are closed to all pedestrian access from November 1 through March 31. Public access is available to the wildlife viewing facility, which lies approximately 500 yards past the public open/close boundary.

Refuge West Side: Year-round from one-half hour before sunrise to one-half hour after sunset, at all locations. Trails on the west side would remain open during hunting seasons, as the trails are not near the designated hunt zones.

(d) How would the use be conducted?
Such activities are allowed on established roads and trails that have been designed to accommodate such uses, in areas that are the least sensitive to human intrusion. These uses are conducted for the general public, as well as for organized groups, including schools and scout groups. Groups of 10 or more will be required to have permission to visit the Refuge for these activities, and a seasonal entrance fee from April 1 through October 31 will be charged to all, with the exception of school groups, scouts on merit badge projects assignments, or children under 16 years of age.

(e) Why is the use being proposed?
Wildlife observation and photography are two of the six priority public uses on National Wildlife Refuges. If compatible, they are to receive enhanced consideration over other secondary public uses. Pedestrian travel, including walking and hiking, are modes of transportation used to access areas for participating in the two identified priority public uses. Future road and trail development at the newly proposed headquarters/visitor contact station site will be designed to maximize resource protection, while providing safe and convenient access to nearby trails via these transportation modes. Realignment of the entrance road and the multi-use trail planned to parallel the entrance road will accommodate safer passage for visitors.

AVAILABILITY OF RESOURCES:

The resources necessary to provide and administer this use, at current use levels, is available within current and anticipated Refuge budgets. Staff time associated with administering this use is related to assessing and conducting trail maintenance, including gates and signs, monitoring potential impacts of the use on Refuge resources and visitors, and providing information to the public about the uses.

The Visitor Services Manager is available for public outreach. A Park Ranger will monitor visitor use and user interactions. The Park Ranger will conduct law enforcement activities to provide for visitor safety and resource protection. Maintenance staff performs the regular maintenance and repairs of Refuge roads and associated structures.

ANTICIPATED IMPACTS OF THE USE:

Pedestrian travel has the potential of impacting shorebird, waterfowl, marshbirds and other migratory bird populations feeding and resting near the trails and on beaches during certain times of the year. Use of upland trails is more likely to impact songbirds than other migratory birds. Human disturbance to migratory birds has been documented in many studies in different locations.

Direct Impacts
Direct impacts have an immediate affect on wildlife. We expect those impacts to include the presence of humans disturbing wildlife, which typically results in a temporary displacement without long-term effects on wildlife individuals or populations. Some species will avoid the areas people frequent, such as the developed trails and the buildings, while others seem unaffected by or even drawn to the presence of humans. Overall, those effects should not be significant, because most of the Refuge will experience minimal public use.

Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities includes: departure from site (Owen 1973, Burger 1981, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. The location of recreational activities impacts species in different ways. Miller et al. (1998) found that nesting success was lower near recreational trails, where human activity was common, than at greater distances from the trails. A number of species have shown greater reactions when

pedestrian use occurred off trail (Miller, 1998). In addition, Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern U.S. In regard to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived, in the late fall, than later in winter. She also found gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1997) found that singing behavior of some species was altered by low levels of human intrusion. Pedestrian travel can impact normal behavioral activities, including feeding, reproductive, and social behavior. Studies have shown that ducks and shorebirds are sensitive to pedestrian activity (Burger 1981, 1986). Resident waterbirds tend to be less sensitive to human disturbance than migrants, and migrant ducks are particularly sensitive when they first arrive (Klein 1993). In areas where human activity is common, birds tolerated closer approaches than in areas receiving less activity.

Indirect Impacts
Laskowski et al. (1993), studied behavior of snowy egrets, female mallards, and greater yellowlegs on Back Bay NWR within 91.4 meters of impoundment dikes used by the general public. Behavior of snowy egrets was recorded during August and September 1992 to represent post-breeding marsh and wading birds. Mallards were monitored during migration (November 1992) and during the winter January (1993). Greater yellowlegs' behavior was observed during the northward shorebird migration (May 1993). Behavior was monitored during the typical public activities of walking, bicycling, and driving a vehicle past the sample sites.

The study found that snowy egret resting behavior decreased and alert behavior increased in the presence of humans. Preening decreased when humans were present, but this change was not significant. Feeding, walk/swim, and flight behaviors were not related to human presence. Female mallards in November increased feeding, preening and alert behaviors in the presence of humans. Resting, walk/swim, and flight behavior were not influenced by human presence. In January, female mallard resting and preening behavior were not influenced by the presence of humans. However, feeding, alert, walk/swim, and flight behaviors were related to human presence. Greater yellowlegs increased alert behavior in the presence of humans. No other behaviors were affected. Maintenance behavior (combined feeding, resting, and preening) decreased when humans were present for all study species. In addition, this decrease was accompanied by an increase in escape behavior by each species. Maintenance behavior of mallards in January decreased in the presence of vehicles and combined disturbance. Escape behavior increased when vehicles were present. Maintenance behavior of greater yellowlegs declined when bicycles and vehicles were present but was not influenced by pedestrian presence.

During a five year study which involved nine different species of birds, researchers found only minimal evidence that intrusion affected bird distributions (Gutzwiller and Anderson 1999). This study also found that the species affected by intrusion were not consistent from year to year or within study areas and could be due to habituation of intrusion (Gutzwiller and Anderson 1999).

People can be vectors for invasive plants by moving seeds or other propagules from one area to another. Once established, invasive plants can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring and treatment when necessary. Our staff will work at eradicating invasive plants and educating the visiting public. Also, opening Refuge lands to public use can often result in littering, vandalism, or other illegal activities on the Refuge.

Cumulative Impacts
Impacts may be minor when we consider them alone, but may become important when we consider them collectively. Our principal concern is repeated disruptions of nesting, resting, or foraging birds. Our knowledge and observations of the affected areas show no evidence that uses cumulatively will adversely affect the wildlife resource. Although we do not expect substantial cumulative impact from these uses in the near term, it will be important for Refuge staff to monitor those uses and, if necessary, respond to conserve high-quality wildlife resources.

Refuge staff, in collaboration with volunteers, will monitor and evaluate the effects of these uses to discern and respond to any unacceptable impacts on wildlife or habitats. To mitigate those impacts, the Refuge will continue to close areas to the public to protect wildlife during critical life periods.

Future road and trail development at the newly proposed headquarters/visitor contact station site will be accomplished on a previously disturbed agricultural site. Realignment of the entrance road and developing a multi-use trail will all occur in an area that has already been developed primarily to accommodate priority public uses and to deliver utilities to the current headquarters. Therefore, little wildlife value will be lost due to newly proposed construction projects. We expect no additional effects from providing these uses on the Refuge.

PUBLIC REVIEW AND COMMENT:

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

No off-road or off-trail access will be permitted, except for emergency or administrative purposes, for the current motor vehicle access permit program for North Carolina residents, and for hunters.

Groups of 10 or more will be required to have permission to visit the Refuge for these activities, and a seasonal entrance fee from April 1 through October 31 will be charged to all, with the exception of school groups, scouts on merit badge projects assignments, or children under 16 years of age.

JUSTIFICATION:

Walking and hiking have been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. We do not expect this use to materially interfere with or detract from the mission of the National Wildlife Refuge System, nor diminish the purposes for which the refuge was established. It will not pose significant adverse effects on Refuge resources, nor interfere with public use of the Refuge, nor cause an undue administrative burden.

Visitors participating in these uses, which facilitate wildlife observation and photography, will provide compatible recreational opportunities for visitors to observe wildlife habitats firsthand, and learn about wildlife and wild lands at their own pace in an unstructured environment. Authorization of these uses will result in a greater constituency for achieving Refuge goals, and, ultimately, the Service mission.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

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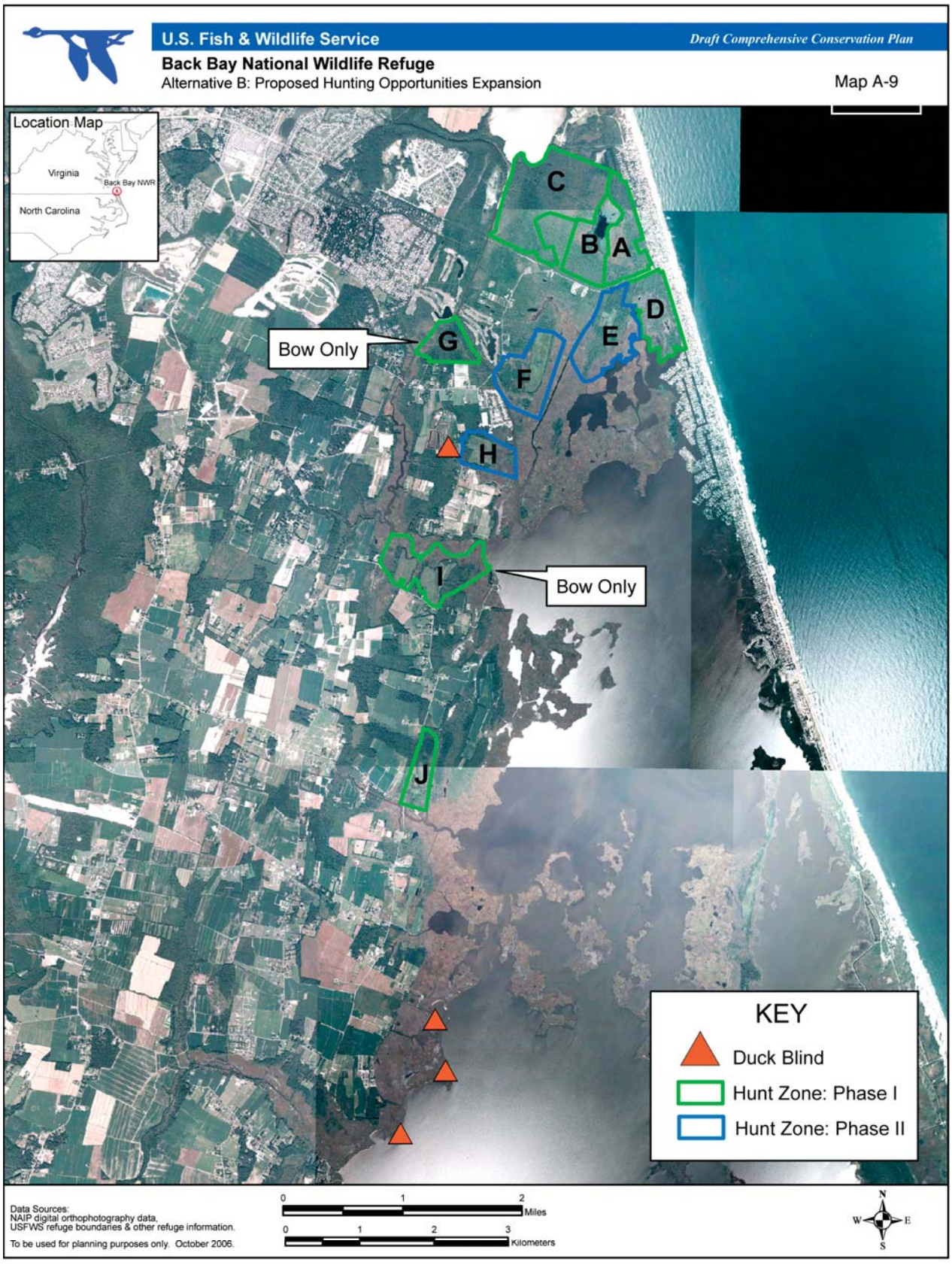

Back Bay National Wildlife Refuge

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Bicycling

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes _____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Bicycling

NARRATIVE

Like walking and hiking, biking is another means to observe wildlife and take photographs. Our dike roads and beach are suitable areas for biking and observing wildlife. Also, the 1997 MOU with Virginia Department of Conservation and Recreation states that the refuge allow public access to False Cape State Park, which is five miles south of the Refuge. Vehicles are not allowed through the Refuge to the State Park; therefore, visitors must walk, hike or bike. This use does not have negative impacts on the Refuge mission and does not require additional resources to allow.

COMPATIBILITY DETERMINATION

USE: Bicycling

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is the use? Is the use a priority public use?
The use is bicycling on Back Bay National Wildlife Refuge. Bicycling is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where would the use be conducted?
Biking is allowed in any public use "zone" of the Refuge. This includes the beach (excluding the North Mile) and trails at the current headquarters/visitor contact station (VCS) on the barrier spit, at canoe/kayak launch facilities and at the proposed new headquarters/VCS and associated trails at Tract #244. This use is not permitted in areas managed for habitat conservation or wildlife protection.

(c) When would the use be conducted?
This use is allowed whenever the zones identified in "b" above are open for public access. Open periods are from one-half hour before sunrise to one-half hour after sunset as follows:

- beach and VCS area to the south end of D-Pool (head of east and west dikes) – year round
- dike trails south of D-Pool – April 1 through October 31
- canoe/kayak launches – April 1 through October 31
- proposed new visitor contact station and trails – year round

(d) How would the use be conducted?
Bicycling can facilitate priority public uses; most commonly observing the natural landscape and taking photos from a bicycle. Riders stop to observe associated animal and plant communities. The use mainly occurs in groups with an average group size of 2-4 riders. Any group of bicyclists exceeding 10 requires a permit to promote safety with other users.

Travel is limited to designated trails with gravel surfaces and where road width can accommodate the safe passage of other users. Designated trails also have sufficient viewing distance for cyclists to detect the approach of other users and maneuver to accommodate them. Cyclists either enter the Refuge at public entry points or transport bicycles by vehicle and park at designated parking sites.

Cycling is conducted in accordance with the stipulations necessary to ensure compatibility. Safety and information signs will be installed at Refuge entry points and at appropriate sites where designated roads intersect other roads and trails. Brochures and maps depicting the roads open for this use will be available at Refuge headquarters and kiosks.

Roads are maintained in such a manner as is practical to minimize environmental effects such as erosion and sedimentation and to provide safe conditions for travel. Existing potholes that promote off-road detours will be filled with gravel. Roads will be monitored and maintained.

(e) Why is the use being proposed?
Although bicycling is not directly a priority public use, it is a means/mechanism to conduct priority public uses, just like walking and hiking. Cycling on the Refuge would provide an increased opportunity for the public to participate in priority public uses. Cycling is less physically demanding than pedestrian access and provides a more expedient mode of travel to view the Refuge's diverse biological assets. At current levels of use and restricted to designated roads with hardened and modified surfaces, cycling causes minimal surface disturbance. Designated roads at the southern end of the Refuge provide good opportunities to view beach, dunes, forested, and marsh communities.

Outfitters, academic institutions and civic organizations (including the Boy Scounts, who conduct environmental education tours on bicycles) have led public biking tours of/through the Refuge. The Refuge anticipates these organizations will continue to request to lead such tours for groups.

AVAILABILITY OF RESOURCES:

The resources necessary to provide and administer this use, at current use levels, is available within current and anticipated Refuge budgets. Staff time associated with administering this use is related to assessing and conducting trail maintenance, including kiosks, gates and signs, monitoring potential impacts of the use on Refuge resources and visitors, and providing information to the public about the use.

The Visitor Services Manager is available for public outreach. A Park Ranger will monitor visitor use and user interactions. The Park Ranger will conduct law enforcement activities to provide for visitor safety and resource protection. Maintenance staff performs the regular maintenance and repairs of Refuge roads and associated structures.

ANTICIPATED IMPACTS OF THE USE:

There is some wildlife disturbance associated with bicycling on the Refuge; however, it is believed not to be at an increased rate when compared to pedestrian use. This is the same for trail/road maintenance. Impacts on habitat from bike tires is also negligible. There is also an inherent greater risk to the public from bicycling. On gravel roads riders can fall, causing personal and property damage to themselves or other Refuge users.

Biking on Refuge trails has the potential of impacting shorebird, waterfowl, marshbirds and other migratory bird populations feeding and resting near the trails and on beaches during certain times of the year. Use of upland trails is more likely to impact songbirds than other migratory birds. Human disturbance to migratory birds has been documented in many studies in different locations.

Direct Impacts
Direct impacts have an immediate affect on wildlife. We expect those impacts to include the presence of humans disturbing wildlife, which typically results in a temporary displacement without long-term effects on wildlife individuals or populations. Some species will avoid the areas people frequent, such as the developed trails and the buildings, while others seem unaffected by or even drawn to the presence of humans. Overall, those effects should not be significant, because most of the Refuge will experience minimal public use.

Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities includes: departure from site (Owen 1973, Burger 1981, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. The location of recreational activities impacts species in different ways. Miller et al. (1998) found that nesting success was lower near recreational trails, where human activity was common, than at greater distances from the trails. A number of species have shown greater reactions when pedestrian use occurred off trail (Miller, 1998). In addition, Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern U.S. In regard to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived, in the late fall, than later in winter. She also found gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1997) found that singing behavior of some species was altered by low levels of human intrusion. Pedestrian travel can impact normal behavioral activities, including feeding, reproductive, and social behavior. Studies have shown that ducks and shorebirds are sensitive to pedestrian activity (Burger 1981, 1986). Resident waterbirds tend to be less sensitive

to human disturbance than migrants, and migrant ducks are particularly sensitive when they first arrive (Klein 1993). In areas where human activity is common, birds tolerated closer approaches than in areas receiving less activity.

Indirect Impacts
Laskowski et al. (1993), studied behavior of snowy egrets, female mallards, and greater yellowlegs on Back Bay NWR within 91.4 meters of impoundment dikes used by the general public. Behavior of snowy egrets was recorded during August and September 1992 to represent post-breeding marsh and wading birds. Mallards were monitored during migration (November 1992) and during the winter January (1993). Greater yellowlegs' behavior was observed during the northward shorebird migration (May 1993). Behavior was monitored during the typical public activities of walking, bicycling, and driving a vehicle past the sample sites.

The study found that snowy egret resting behavior decreased and alert behavior increased in the presence of humans. Preening decreased when humans were present, but this change was not significant. Feeding, walk/swim, and flight behaviors were not related to human presence. Female mallards in November increased feeding, preening and alert behaviors in the presence of humans. Resting, walk/swim, and flight behavior were not influenced by human presence. In January, female mallard resting and preening behavior were not influenced by the presence of humans. However, feeding, alert, walk/swim, and flight behaviors were related to human presence. Greater yellowlegs increased alert behavior in the presence of humans. No other behaviors were affected. Maintenance behavior (combined feeding, resting, and preening) decreased when humans were present for all study species. In addition, this decrease was accompanied by an increase in escape behavior by each species. Maintenance behavior of mallards in January decreased in the presence of vehicles and combined disturbance. Escape behavior increased when vehicles were present. Maintenance behavior of greater yellowlegs declined when bicycles and vehicles were present but was not influenced by pedestrian presence.

The presence of bicycles and vehicles increased escape behavior. Snowy egrets and female mallards increased movement between subplots and to areas within the study area but further from the disturbance.

During a five year study which involved nine different species of birds, researchers found only minimal evidence that intrusion affected bird distributions (Gutzwiller and Anderson 1999). This study also found that the species affected by intrusion were not consistent from year to year or within study areas and could be due to habituation of intrusion (Gutzwiller and Anderson 1999).

People can be vectors for invasive plants by moving seeds or other propagules from one area to another. Once established, invasive plants can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring and treatment when necessary. Our staff will work at eradicating invasive plants and educating the visiting public. Also, opening Refuge lands to public use can often result in littering, vandalism, or other illegal activities on the Refuge.

Cumulative Impacts
Impacts may be minor when we consider them alone, but may become important when we consider them collectively. Our principal concern is repeated disruptions of nesting, resting, or foraging

birds. Our knowledge and observations of the affected areas show no evidence that biking on refuge trails will adversely affect the wildlife resource. Although we do not expect substantial cumulative impact from biking in the near term, it will be important for Refuge staff to monitor, and, if necessary, respond to conserve high-quality wildlife resources.

Refuge staff, in collaboration with volunteers, will monitor and evaluate the effects of biking to discern and respond to any unacceptable impacts on wildlife or habitats. To mitigate those impacts, the Refuge will continue to close areas to the public to protect wildlife during critical life periods.

PUBLIC REVIEW AND COMMENT:

As part of the CCP process for Back Bay NWR this compatibility determination will undergo extensive public review, including a comment period of 30 days following the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

_X_ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Cycling to facilitate priority public uses is only compatible on the roads designated and described above.
- Access routes will not significantly impact threatened or endangered species.
- Signs necessary for visitor information, safety, and traffic control will be installed.
- The Refuge will conduct an outreach program to promote public awareness and compliance with Refuge public use regulations.
- Camping and overnight parking are prohibited.
- Cycling is not allowed during the white tail deer/feral hog hunting season (October) for public safety.
- To promote safety with other users and encourage a nature viewing experience, group size limit exceeding 10 cyclists will require a permit.
- All routes designated for public access will be annually inspected for maintenance needs. Road and trail conditions that require immediate maintenance will be identified and appropriate action will be taken to correct such conditions. Prompt action will be taken to correct any conditions that risk public safety.
- Routine law enforcement patrols will be conducted throughout the year. The patrols will promote compliance with Refuge regulations, monitor public use patterns and public safety. Conditions that are or will risk public safety will be identified and appropriate action will be promptly taken to correct such conditions.

JUSTIFICATION:

This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established. It will not pose significant adverse effects on Refuge resources, will not interfere with public use of the Refuge, nor cause an undue administrative burden. It is a means to conduct priority public uses.

Signature: Refuge Manager Jarrod Brandwein 9/1/2010
(Signature and Date)

Concurrence: Regional Chief Anthony D Léger 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

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603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Launching of Non-Trailered Vessels

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Launching of Non-Trailered Vessels

NARRATIVE

The Refuge does not have the infrastructure to support trailers in our parking areas; however, it is within Refuge operational capacity to permit the launching of vessels that fit on or in a vehicle. Non-trailered vessels tend to be smaller in size, or non-motorized, which are hand launched (i.e. canoe/kayaks). Like walking, hiking, and biking, canoe/kayaking is another means to observe wildlife and take photographs. Smaller boats, not intended for fast speeds, are utilized to access the Long Island hunt zone and to fish Back Bay. Non-motorized boats do not have a negative impact on water quality of the Refuge. We currently provide car top boat launch facilities at two locations on the Refuge, with three more proposed in the CCP.

COMPATIBILITY DETERMINATION

USE: Launching of Non-Trailered Vessels

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is the launching of non-trailered vessels. This use is not considered a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Launching is allowed at five locations (Map A-10); the existing canoe/kayak launch at the headquarters/Visitor contact Station, the existing canoe/kayak launch on Horn Point Road, and the proposed canoe/kayak launches on Muddy Creek Road at Beggar's Creek, on Sandbridge Road at Asheville Bridge Creek and on Sandbridge Road at Hell's Point Creek.

(c) When would the use be conducted?
The canoe/kayak launch at the existing headquarters/Visitor contact Station is currently open year-round. The canoe/kayak launch on Horn Point Road is currently open from April 1 through October 31 of each year. The planned canoe/kayak launch at Asheville Bridge Creek will be open

from April 1 through October 31, until the time when the administrative headquarters is moved to that locale. The planned Hell's Point Creek and Beggar's Creek canoe/kayak launches will be open for public use from April 1 though October 31 of each year. Use will be permitted one-half hour before sunrise to one-half hour after sunset. For launches seasonally opened, Special Use Permits can be issued for use during closed seasons.

(d) How would the use be conducted?
Visitors to these sites are only allowed to launch boats that fit in or on top of their vehicle. No trailers are permitted due to limited parking. No personal watercrafts (PWCs) are allowed to launch, even if not on a trailer. Canoe/Kayak outfitters, or guides, will be charged a fee and granted a Special Use Permit to utilize a multi-boat trailer.

(e) Why is this use being proposed?
This use allows for a mode of travel on water to view the Refuge's diverse biological assets. At current levels of use, canoes and kayaks would cause minimal resource disturbances. This use provides a means to conduct wildlife-dependent recreational activities under the NWRS Improvement Act of 1997 (i.e., fishing, wildlife observation, photography, hunting). Also, as part of the Refuge boundary expansion in the late 1980's, the Refuge agreed to the City of Virginia Beach to increase public access to Back Bay through cooperative access sites.

AVAILABILITY OF RESOURCES

Providing/Managing this use, at all locations, is within the available Visitor Services Program staff resources because visitors utilizing this use "come-and-go" just like a visitor walking the trails to observe wildlife. Compliance with site regulations is within the regular duties of the Station Law Enforcement Officer. However, the facilities constructed to provide this use require initial start-up and additional maintenance costs, of which the former would need to be appropriated by Congress.

Anticipated costs are:

- Materials to develop/enhance the existing and proposed sites
  - Horn Point Road – $11,000
  - Hell's Point Creek - $200,000
  - Asheville Bridge Creek - $5,000
  - Beggar's Creek - $200,000

- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (coordination with City and contractors) - 24 weeks start-up = **$38,400**; 4 weeks/yr. after start-up = **$6,400**

- Deputy Refuge Manager (GS-13) (review proposals, budgeting) - 8 weeks start-up = **$15,000**; 2 weeks/yr. after start-up = $**3,750**

- Refuge Manager (GS-14) (coordination, etc.) – 4 weeks start-up = **$8,320**

- Maintenance Worker (WG-09) (construct and maintain blind; maintain facilities) - 4 weeks start-up = **$3,800**; 4 weeks/yr. after start-up = **$3,800**

- Law Enforcement Officer (GS-09) (enforcement patrols) 6 weeks/yr. = **$6,300**

ANTICIPATED IMPACTS OF THE USE

Any time a public access site is opened, there is potential for increased littering and loitering. This impact is reduced by providing necessary amenities for trash and locked gates to restrict access when closed.

For songbirds, Gutzwiller et al. (1997) found that singing behavior of some species was altered by low levels of human intrusion. Boat launching may minimally impact normal behavioral activities, including feeding, reproductive, and social behavior; however the areas identified for this activity already have a long history of human disturbance and related habitat degradation. Studies have shown that ducks and shorebirds are sensitive to human activity (Burger 1981, 1986). Resident waterbirds tend to be less sensitive to human disturbance than migrants, and migrant ducks are particularly sensitive when they first arrive (Klein 1993). In areas where human activity is common, birds tolerated closer approaches than in areas receiving less activity.

The Horn Point Launch site is closed to boat launching during the peak bird migration season of November through March. In any case, there is a significant seasonal reduction of boat launching activity on the bay during these months due to colder weather conditions and a related substantial drop in boating tourism and recreation on the bay.
Motor boats can erode sensitive marsh shoreline with their wakes, disturb nesting birds and re-suspend bottom sediments, which reduce water quality and SAV production. These impacts are reduced by prohibiting trailered boats and personal watercrafts that tend to be bigger and faster. Non-motorized boats do not have a negative impact on water quality of the Refuge.

Providing greater boating access to Back Bay at appropriate Refuge locations allows greater opportunity for the public to view and photograph wildlife in a natural setting, and provides expanded environmental education opportunities.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

_____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

No trailered boats and no personal watercrafts will be allowed to launch. Additional funding must be provided to develop two of the proposed launch sites (see Availability of Resources above).

JUSTIFICATION

As part of the Refuge boundary expansion in the late 1980's, the Refuge agreed to the City of Virginia Beach to increase public access to Back Bay through cooperative access sites on lands acquired by the Refuge. The Refuge currently provides car top boat launch facilities at two locations on the Refuge. Like walking, hiking, and biking, canoe/kayaking is another means to observe wildlife and take photographs. Smaller boats, not intended for fast speeds, are utilized to access the Long Island hunt zone and to fish Back Bay. Non-motorized boats do not have a negative impact on water quality of the Refuge.

This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established. It will not pose significant adverse effects on Refuge resources, will not interfere with public use of the Refuge, nor cause an undue administrative burden. It is a means to conduct priority public uses.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

LITERATURE CITED:

Burger, J. 1981. The effect of human activity on birds at a coastal bay. Biological Conservation. 21:231-241.

Burger, J. 1986. The effect of human activity on shorebirds in two coastal bays in northeastern United States. Environmental Conservation. 13:123-130.

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Gutzwiller, K.J., S.H. Anderson. 1999. Spatial extent of human-intrusion effects on subalpine bird distributions. The Condor. 101: 378-389.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. Wildlife Society Bulletin. 19:242-248.

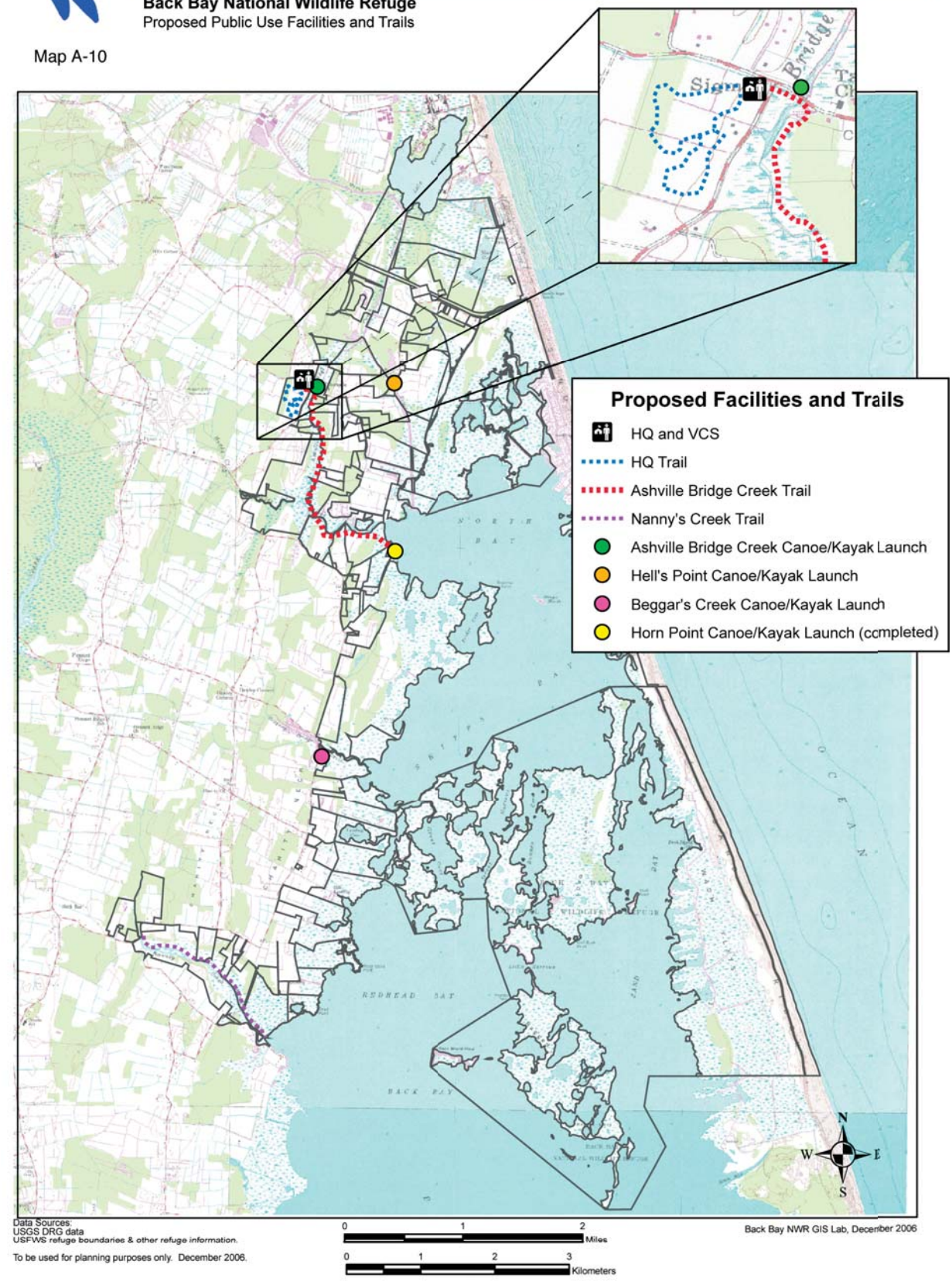
Korschen, C.E., L.S. George, and W.L. Green. 1985. Disturbance of diving ducks by boaters on Comprehensive Conservation Plan - 215 - Appendix G: Final Compatibility Determinations a migrational staging area. Wildlife Society Bulletin. 13:290-296.

Compatibility Determination– Launching of Non-Trailered Vessels

Draft Comprehensive Conservation Plan

Back Bay National Wildlife Refuge
Proposed Public Use Facilities and Trails

Map A-10



Draft Comprehensive Conservation Plan & Environmental Assessment

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: False Cape State Park Access (Through Refuge)

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: False Cape State Park Access (Through Refuge)

NARRATIVE

False Cape State Park is located to the south of Back Bay NWR, with its only access from Virginia Beach being through the Refuge. In 1996, the Service and Virginia Department of Conservation and Recreation signed a Memorandum of Understanding (MOU), which describes stipulations for providing both public access and access for official business to False Cape State Park. This "Access Agreement" includes stipulations for operating a public transit system, and where and when access is granted through the Refuge. To uphold our commitment to the MOU, which facilitates a cooperative partnership with False Cape State Park, we allow this use.

COMPATIBILITY DETERMINATION

USE: False Cape State Park Access (Through Refuge)

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is providing public access and access to Park employees to False Cape State Park. This is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Public access, and access for official business, to False Cape State Park is allowed on the east and west dike roads, and the beach.

(c) When would the use be conducted?
Access via one of the two dikes is available twelve months a year during refuge hours. Decisions as to which dike will be opened or closed is based upon wildlife surveys and seasonal management practices. The opening and closing of a dike access route is closely coordinated with the park and generally covers weekly or monthly periods. State park employees are not restricted by 50 CFR 26.34.

(d) How would the use be conducted?
The use is conducted according to the 1996 Memorandum of Understanding (MOU) signed by the Regional Director of the Service and the Governor of Virginia (Attachment A.2). In order to minimize wildlife disturbances, administrative and public access is provided with stipulations on how many trips and where trips can occur through the Refuge. In summary, these stipulations are as follows:

Table A.1. Number of Vehicle Trips[1] Per Day

Month	East Dike Admin. Access	West Dike Admin. Access	Beach Admin. Access	Public Dike Access	Public Beach Access
January	Closed	8	32	Closed	Open
February	Closed	8	30	Closed	Open
March	Closed	16	24	Closed	Open
April	Closed	38	Minimized[2]	West Open	Open
May	Closed	38	Minimized	West Open	Open
June	40	Closed	Minimized	East Open	Open
July	44	Closed	Minimized	East Open	Open
August	38	Closed	Minimized	East Open	Open
September	40	Closed	Minimized	East Open	Open
October	40	Closed	Minimized	East Open	Open
November	10	Closed	34	Closed	Open
December	Closed	8	34	Closed	Open

[1] *Trips is used to describe a single event when vehicular travel via an access route has the potential to disturb wildlife. No public vehicles are allowed through the Refuge.*

[2] *The goal is to minimize motor vehicle disturbance; however, other Motor Vehicle Access Permit*

Program permits make it difficult to completely close the beach to disturbance as they maintain limited access during these months. It is preferred to access the Park via a dike access route for these months.

Public access coincides with the closure of our dike roads in the winter. During this time, the public can access False Cape State Park via the beach. April through October, the public can also access the Park via Refuge dike roads. The MOU also specifies operation of a public tram (i.e. transit) to the Park, which runs April through October. These trips are included in the total number of trips per day.

(e) Why is this use being proposed?
False Cape State Park is located to the south of Back Bay NWR with its only access from Virginia Beach being through the Refuge. To administer park operations, it is necessary for Park staff to travel through the Refuge to/from work. Several Park staff live on property, and therefore traverse the Refuge to manage their households. In 1996, the Service and Virginia Department of Conservation and Recreation signed a Memorandum of Understanding (MOU), which describes stipulations for both administrative and public access to False Cape State Park. Public access through the Refuge does provide wildlife-dependent recreational opportunities for Park visitors. For information regarding pubic compatibility, see the determination titled, Wildlife Observation, Photography, Environmental Education, and Interpretation.

AVAILABILITY OF RESOURCES

Additional vehicular traffic degrades our dike roads faster with this use; however, the Park assists with road maintenance. Additional cost for stone and labor to maintain our dike roads is as follows:

- Maintenance Worker (WG-09) (road and loader maintenance) - 2 week/yr. = **$1900**

ANTICIPATED IMPACTS OF THE USE

Allowing access to False Cape State Park does incur wildlife disturbances; however, the 1996 MOU was developed and agreed upon to greatly minimize negative impacts to wildlife. Impacts include flushing migratory birds off resting and feeding areas, which reduces their energy reserves during migration. This disturbance is slightly greater with vehicular access than pedestrian access; however, access routes are established to reduce impacts. Additional vehicular traffic also degrades our dike roads faster with this use; however, the Park assists with road maintenance.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

_____ **Use is Not Compatible**

__X__ **Use is Compatible With the Following Stipulations**

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

False Cape State Park staff must adhere to the 1996 MOU regarding the number and location of vehicle trips. Park staff shall notify the Refuge Manager requesting any modifications.

JUSTIFICATION

False Cape State Park is located to the south of Back Bay NWR, with its only access from Virginia Beach being through the Refuge. In 1996, the Service and Virginia Department of Conservation and Recreation signed an MOU, which describes stipulations for providing both public and administrative access to False Cape State Park. To uphold our commitment to the MOU, we continue to allow this use. In addition, this activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established.

This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established. It will not pose significant adverse effects on Refuge resources, will not interfere with public use of the Refuge, nor cause an undue administrative burden.

Signature: Refuge Manager Jared Bamberger 9/1/2010
(Signature and Date)

Concurrence: Regional Chief Anthony D Léger 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

ATTACHMENT A.2 1996 MEMORANDUM OF UNDERSTANDING (MOU)

MEMORANDUM OF UNDERSTANDING

BETWEEN THE

U.S. DEPARTMENT OF THE INTERIOR,

FISH AND WILDLIFE SERVICE

AND THE

COMMONWEALTH OF VIRGINIA

REGARDING ACCESS THROUGH THE

BACK BAY NATIONAL WILDLIFE REFUGE TO THE

FALSE CAPE STATE PARK

NOVEMBER 7, 1996

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
U.S. FISH AND WILDLIFE SERVICE
AND THE
COMMONWEALTH OF VIRGINIA

This Memorandum of Understanding (MOU) is made and entered into by the United States Department of the Interior, Fish and Wildlife Service (Service), represented by the Regional Director, Region 5, and the Commonwealth of Virginia, acting through its Department of Conservation and Recreation (DCR), represented by its Director.

I. INTRODUCTION

A. History

The Back Bay National Wildlife Refuge (Refuge) and the False Cape State Park (Park) are co-located on a narrow stretch of barrier spit in the southeastern corner of Virginia. The Park is located south of the Refuge and is not served by public roads. Access to the Park traditionally included foot, bicycle, and limited motor vehicle travel over the Refuge dike system and along the beach. Access to the Park through the Refuge has been an issue since the creation of the Park, as no formal right-of-way was established. Limited vehicular access was provided through annual Refuge special use permits.

In 1993, the Refuge was required, as a result of a nationwide lawsuit, to conduct compatibility determinations on all secondary uses of the Refuge. One such determination found that travel over the dikes by people on foot, on bicycles, and in vehicles disturbed migratory birds at critical times and, therefore, the use was seasonally incompatible. Access was restricted by the Service during those periods.

In March 1995, Congress, through the Senate Committee on Environment and Public Works, encouraged the Service and the Commonwealth to settle this ongoing dispute. The Committee "strongly urges the Fish and Wildlife Service and the State to negotiate a new, multi-year agreement that is consistent with the authorized purposes of the Back Bay National Wildlife Refuge and that provides adequate access to False Cape State Park."

B. Purpose

This MOU is based on the understanding that the co-existence of these two adjacent properties creates cumulative benefits for wildlife and the public that are far greater than could be achieved separately. The agreement is designed to allow public access to the Park through the Refuge, while minimizing disturbance to wildlife. The MOU also facilitates the cooperative management of this unique ecosystem for the benefit of the citizens of Virginia and the United States.

The conditions in this MOU are based on the management and development parameters for both the Park and Refuge as outlined in their respective long range plans. The MOU shall remain in place so long as these management parameters do not change or until it is terminated as per the conditions outlined in Section III.D of this document. Special use permits will be reissued by the Service to the Park every five years under the conditions of this MOU. Through the MOU, the Service and DCR seek:

1. To provide a safe and rewarding experience for the public.

2. To ensure that migratory bird populations and other wildlife and natural heritage resources of the Back Bay ecosystem are afforded protection critical to their health and survival.

3. To provide efficient and effective management operations at both the Park and the Refuge.

4. To promote and encourage high quality environmental education and other natural resource programs at the Park and the Refuge.

C. Responsibilities/Authorities

1. The mission of the Service is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. The purposes for which the Refuge was established are:

a. As a refuge and breeding ground for migratory birds and other wildlife.

b. For the use as an inviolate sanctuary, or for any other management purpose, for migratory birds.

c. For the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

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2. The mission of DCR is to conserve, enhance, and advocate wise use of the Commonwealth's unique natural, recreational, historic, scenic, and cultural resources. The purposes for which the Park was established are to:

a. Provide low impact, day-use and overnight recreation opportunities.

b. Provide environmental education and research opportunities on a unique barrier ecosystem.

c. Conserve significant natural heritage communities and resources; protect and interpret the Park's natural, cultural, and historical resources.

3. This MOU is made and entered into pursuant to the provisions of the following statutes:

a. Fish and Wildlife Coordination Act, 16 U.S.C. 661.

b. Fish and Wildlife Act, 16 U.S.C. 742.

c. National Wildlife Refuge System Administration Act, 16 U.S.C.

d. Refuge Recreation Act, 16 U.S.C. 460.

e. Virginia's Powers of the Department §10.1-104(A)(2) of the Code of Virginia (1950).

f. Virginia's Conveyance or Lease of Lands and other Properties §10.1-109 of the Code of Virginia (1950).

4. Nothing in this agreement abrogates the statutory requirements and responsibilities of either agency.

II. **AGREEMENT**

A. The Commonwealth and the Service agree that:

1. Public use of the Refuge impoundment/dike system can cause disturbance to migratory birds. Management of the impoundments for migratory birds must be both flexible and dynamic to provide high quality habitat for shore and wading birds and waterfowl. Disturbance to migratory birds will be minimized/avoided through the use of alternate access routes into the Park over the Refuge dikes and beach and via consolidation of trips through the Refuge. Access scheduling will consider seasonal wildlife usage, management practices, and weather-related events.

2. The level of access through the Refuge to the Park authorized by this MOU will be implemented through the issuance of multi-year permits at five year intervals. Access to the Park will be permitted along designated dike routes and/or the beach. Selection of a designated access route will be based upon weekly wildlife surveys and seasonal management practices. By alternating routes, limited access along at least one of the dikes will be available at all times. The selection of the dike access route will be closely coordinated with the Park, clearly marked for visitors, and generally cover weekly or monthly periods.

3. A visitor transportation system or "tram" will be incorporated into Park and Refuge management to reduce the number of disturbances and the duration of each disturbance. As demand for access increases, it will become necessary to rely on a visitor transportation system, both to limit disturbance to wildlife and to promote a higher quality experience for all visitors. The conveyance should use environmentally-sensitive alternative fuels, as technologically feasible. The Commonwealth and the Service will jointly schedule the use of the visitor transportation system.

4. The Commonwealth will enhance management capabilities at the Barbours Hill impoundment area and will turn primary management authority for this area over to the Service. The Service will manage this area in consultation with the Virginia Department of Game and Inland Fisheries. The enhanced management capability of the Barbours Hill area will improve 217 acres of migratory bird habitat. This additional acreage will further offset the functional loss of habitat on the Refuge caused by the access to the Park. Hunting activities and wildlife observation may be permitted on the Barbours Hill impoundment area to the extent that they are compatible with migratory bird management.

5. A long-term objective of the DCR and the Service is to protect the natural beach ecosystem of both properties during critical periods of the year. This MOU initiates a process to limit access along the Refuge beach during the seasons when shorebirds, wading birds, and sea turtles utilize this area.

6. An additional objective of both agencies is to provide coordinated, quality environmental education experiences for Park and Refuge visitors.

7. Expenses associated with maintaining the tram and travel corridor dikes shall be shared by the Service and the DCR.

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The "tram operating plan" (see Section II.D.2) will be developed before the tram is put into service. This plan will identify the usage, logistics, and maintenance requirements for the tram. Each agency's maintenance obligations will be described in a Cooperative Agreement that will address both dike and tram maintenance cost sharing.

8. Vehicle access through the Refuge to the Park will be permitted through Special Use Permits based upon the following guidelines. Attachment 1 provides a more detailed description of the desired number of trips per day at full Park development to meet the reasonable needs for the management of the Park. The Special Use Permit will reflect numbers allowed at maximum development, but the actual number of vehicle trips per day will incrementally increase to these numbers until the Park attains its full development plan. Non-vehicular public access through the Refuge to the Park will also be permitted at the levels identified in Attachment 1 along these same routes.

NUMBER OF VEHICLE TRIPS[1] PER DAY

MONTH	EAST DIKE	WEST DIKE	BEACH
January	closed[2]	4	32
February	closed	4	30
March	closed	16	24
April	closed	38	minimized[3]
May	closed	38	minimized
June	40	closed	minimized
July	44	closed	minimized
August	38	closed	minimized
September	40	closed	minimized
October	40	closed	minimized
November	6	closed	34
December	closed	4	34

[1] "Trips" is used to describe a single event when vehicular travel via an access route has the potential to disturb wildlife. A disturbance may be multiple vehicles, as long as they are traveling together (i.e., not intermittent).

[2] Access via one of the two dike routes will be available 12 months a year. Decisions as to which dike will be open or closed will be based upon wildlife surveys and seasonal management practices. The opening and closing of a dike access route will be closely coordinated with the Park and will generally cover weekly or monthly periods.

[3] Disturbance to wildlife along the beach access route is a concern during certain months of the year. Other permits make it

difficult to close the beach to disturbance at this time. It is the long term goal of the Service to minimize disturbance along the beach resulting from through-traffic. It is hoped this can be done by transporting visitors to the Park via a dike access route for these months.

B. The Service agrees:

1. To support the mission and purposes of the Park to the extent allowable by the purposes of the Refuge.

2. To permit limited access to the Park through the Refuge for employees, visitors, Park cooperators, and Park contractors at the levels indicated in Section II.A.8 above. Access conditions will be described in a Special Use Permit (Attachment 3) issued every five years based on the continuing conditions of this MOU. The access will be permitted 365 days a year, with interior dike access available daily. Access will be managed and controlled with alternate route selection dependent on seasonal wildlife usage, management practices, and weather related events. In cases of severe weather or any other emergency, the health and well being of people (e.g., visitors, permittees, resident staff and their families) will take priority. Access restrictions will be suspended for the duration of the emergency.

3. To manage any and all habitat acreage for which primary management responsibility is transferred to the Service by the Commonwealth.

4. To provide technical assistance on the dike rehabilitation project at Barbours Hill.

C. The Commonwealth agrees:

1. To support the mission and purposes of the Refuge to the extent allowable by the purposes of the Park.

2. To coordinate access for Park business based on the levels indicated in Section II.A.8 above and ongoing communications about special conditions.

3. To approve and adopt the Development Plan for the False Cape State Park (Attachment 2) as the parameters within which the Park will be operated and developed.

4. To designate all areas of the Park as a Natural Area Preserve (Attachment 4), other than those areas already

developed, those designated for development in the Development Plan for False Cape State Park (Attachment 2), and those restricted for inclusion by law.

5. To convey primary management responsibility of the Barbours Hill waterfowl management area to the Service, to be managed in consultation with the Virginia Department of Game and Inland Fisheries (Attachment 5). Barbours Hill will be improved to provide for timely management of this acreage commensurate with the existing impoundment management plan on the Refuge. The minimum required to accomplish this is:

a. Raise the dike along the west boundary to a height that will allow for the complete flooding of the acreage considered as part of the transferred area.

b. Construct a clay core, or other structurally sound seepage barrier, in the dike to ensure adequate holding capacity.

c. Widen and slope the dike to safely accommodate a "people mover" and other vehicular traffic and to facilitate safe maintenance and structural integrity.

d. Replace two water control structures with the size necessary to control water levels and of a type existent on the Refuge.

e. Implement an invasive species control program within the impoundments and surrounding dikes for a maximum of five years or until invasive species have been brought under control and high concentration areas have been eliminated.

f. Share the maintenance expenses of the improved dike, as identified in Section II.A.7.

D. To carry out the purposes of this MOU, the Service and the Commonwealth further agree:

1. To seek out available sources of funding (including private sector participation and voluntary contributions) to secure an alternative fuel conveyance for a visitor transportation system.

2. To develop and execute a "tram operating plan" that will include maintenance and operation, fee collection, and cost sharing.

3. To manage the Refuge and the Park according to the

respective management plans.

4. To develop and execute a Back Bay/False Cape Cooperative Management Plan with the objective of enhancing the quality of a visit for our constituents (environmental education, law enforcement, etc.).

5. To have on-site managers meet annually to discuss the management implications of this MOU and to prepare an action plan for the following year.

6. To continue and coordinate hunt programs for recreational and wildlife management purposes.

III. IMPLEMENTATION

A. Points of Contact:

Refuge Manager Back Bay National Wildlife Refuge 4005 Sandpiper Road Virginia Beach, VA 23453	Park Manager False Cape State Park 4001 Sandpiper Road Virginia Beach, VA 23453
(757) 721-2412	(757) 426-7128

B. Projects and Work Orders

Projects, work orders, contracts, and other activities that require a transfer of funds between the two agencies will be prepared as cooperative agreements. These agreements will specify the duration, nature, and form of any deliverables. They will not include any recovery of indirect (overhead) costs and may be executed between any elements of the two agencies that are authorized to obligate funds. Reimbursable agreements for project-level activities will not be attached to this agreement.

C. Amendments and Annexes

This agreement can be amended by mutual consent of both parties. Significant changes will be distributed for public review for 30 days prior to implementation, or other time frames that may be required pursuant to the National Environmental Policy Act. Amendments will be added as Attachments.

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List of Annexes:

Attachment 1 - Table of Proposed Maximum Access Through Back Bay National Wildlife Refuge to False Cape State Park

Attachment 2 - False Cape State Park Development Plan

Attachment 3 - Special Use Permit

Attachment 4 - False Cape State Park Natural Area Preserve Designation Description and Map

Attachment 5 - Barbours Hill Plat and Description

D. Termination

This MOU shall be effective upon execution and shall be implemented through the concurrent issuance of renewable, five-year Special Use Permits (SUP). Either party may terminate the MOU after a 90 day notice for reasons of: [1] abandonment of the project; [2] failure to utilize lands for the intended/stated purposes; [3] any other material breach of the conditions of this MOU (particularly those conditions agreed to in parts II.A, II.B, II.C, and II.D) and its affiliated SUP, unless cured within said period; [4] any change in applicable Federal or State law materially affecting the activities authorized hereunder. Should new information, needs, or disagreements arise, every effort will be made to renegotiate and amend the agreement before resorting to termination.

Ronald E Lambertson

egional Director

. Fish and
dlife Service

-7-96

George Allen

Governor

Commonwealth of Virginia

November 7, 1996
Date

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603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Biological Research

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Biological Research

NARRATIVE

Back Bay NWR does not have the resources to conduct all the necessary biological surveys and studies to manage all resources to carrying capacity. Therefore, we encourage research by outside entities to assist us in collecting and providing biological data for our use. All research proposals are evaluated for their benefits to the Refuge mission and issued a Special Use Permit if found beneficial. All research projects require the principal investigator to provide summary reports of findings and acknowledge the Refuge for their participation.

COMPATIBILITY DETERMINATION

USE: Biological Research

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITY(IES): The Refuge was established by Executive Order No. 7907 on June 6, 1938 and land is acquired under the Migratory Bird Conservation Act (16 U.S.C. 715-715d, 715e, 715f-715r) of February 18, 1929, (45 Stat. 1222), as amended, and the Emergency Wetlands Resources Act of 1986 (Public Law 99-645; 100 Stat. 3582), as amended.

PURPOSES FOR WHICH THE REFUGE WAS ESTABLISHED:

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The use is research conducted by non-Service personnel on the Back Bay National Wildlife Refuge (Back Bay NWR/the Refuge). It is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
The locations of the research will vary, depending on the research project being conducted. The entire Refuge is open and available for scientific research. A 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 locations are limited to those areas of the refuge that are absolutely necessary for conducting the research and that do not create a significant negative impact to Refuge operations and wildlife use.

(c) When would the use be conducted?
The timing of the research depends entirely on the research project needs. We allow scientific research on the Refuge throughout the year, as long as that use does not present a significant negative impact to wildlife use and Refuge management operations. Some projects could be short-term in design, requiring one or several visits over the course of a few days or weeks. Others could be multiple year studies that require more frequent visits to the location. The timing of each use is limited to the minimum required for completion – the Special Use Permit will state the expected time/duration of the research project. If a research project occurs during a Refuge hunting program, 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 work will depend entirely on the individual research project. We will carefully scrutinize the objectives, methods, and approach of each research project before allowing it to occur on the Refuge. We do not permit a research project that lacks an approved study plan and protocol, compromises public health and safety or presents a significant negative impact to Refuge wildlife resources. This permitted research use must be regulated and governed by the conditions and other terms of a Refuge Special Use Permit (SUP). The SUP will provide any needed protection to Refuge policies, mission, wildlife populations, and natural habitats. In addition, all research projects require the primary investigator to submit written summary reports of all findings, and acknowledge the Refuge's participation.

(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 public. Such studies further our understanding of the natural environment that we are responsible for managing. Research is therefore an important part of the adaptive management process that often results in improved management of Refuge habitats and wildlife populations. Much of the information that research generates can be applied to management practices both on and adjacent to the Refuge. Past and ongoing Refuge research projects have studied: public use impacts to migratory waterfowl use in the impoundment complex; plant species composition and communities; feral pig population dynamics; resident Canada goose genetics and population distribution; Anuran population composition; migrating songbird population distribution; sand dune movements; rare plant presences and distribution; nutritional value of waterfowl and shorebird foods in coastal impoundments; impoundment management techniques; water quality monitoring; submerged aquatic vegetation abundance and distribution; Avian Influenza migratory bird monitoring; and Cottonmouth snake biology. Many of these are, or have been, multi-year studies.

The Service encourages and supports research and management studies on refuge lands that will improve and strengthen decisions for managing natural resources. The Refuge Manager encourages and seeks research that clearly relates to approved refuge objectives, improves habitat management, and promotes adaptive management. Priority research addresses information on better managing the Nation's biological resources that generally are important to agencies of the Department of Interior, the National Wildlife Refuge System, and State Fish and Game Agencies, and that address important management issues, or demonstrate techniques for managing species or habitats.

Back Bay NWR also considers research for other purposes that may not relate directly to Refuge-

specific objectives, but contribute to the broader enhancement, protection, use, preservation or management of native populations of fish, wildlife and plants, and their natural diversity in the Northeast Region and/or the Atlantic Flyway. All proposals must comply with Service policy on compatibility.

Refuge support for research that relates directly to Refuge objectives may take the form of funding, in-kind services (i.e. housing, use of other Refuge facilities, vehicles, boats, or equipment), and the direct assistance of Refuge staff in collecting field data, providing historical records, conducting management treatments, and/or providing other assistance as appropriate.

AVAILABILITY OF RESOURCES:

Back Bay NWR incurs the bulk of the cost for research in staff time to review research proposals, coordinate with researchers, and write special use permits (SUP). In some cases, a research project may require only one day of staff time to write a SUP. In other cases, a research project may take many weeks, because the Refuge staff must coordinate with students and advisors and accompany researchers on site visits.

The estimated average annual costs associated with such administration and implementation of outside research proposals on Back Bay NWR are:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review proposals, coordinate with researchers, assist with implementation, special use permits, etc.) - 3 weeks/yr. = **$4,850**
- Deputy Refuge Manager (GS-13) (review proposals, budgeting, housing and vehicle coordination, etc.) - 4 days/yr. = **$1,500**
- Refuge Manager (GS-14) (coordination, budgeting, etc.) - 2 days/yr. = **$835**
- Administrative Assistant (GS-06) (office administration/permits) – 1 week/yr. = **$900**
- Maintenance Worker (WG-09) (vehicle, boat, housing maintenance) - 1 week/yr. = **$1,200**

Total Estimated Cost = **$8,650**

In some cases, the costs may be less; particularly if there is not a need for implementation and maintenance assistance from Refuge personnel (i.e. manpower and/or equipment).

ANTICIPATED IMPACTS OF THE USE:

The Service encourages approved research to further the understanding of natural resources. Research by non-Service personnel adds greatly to the information base for refuge managers to make proper decisions. Some level of disturbance is expected with all research activities because researchers may be entering areas that are normally closed to the public, traveling off designated trails, collecting samples and/or handling wildlife. However, the special use permit will detail special conditions designed to minimize such negative impacts. Allowing non-Service personnel to conduct research should have little impact on Service interests if the research proposal is

completed properly by the researcher, and if Refuge personnel spell out the appropriate special conditions as part of the research proposal review and SUP preparation process. Violations of the special conditions in the Refuge SUP can result in suspension and termination of the research. If researchers conduct their projects with professionalism and integrity, the knowledge gained far outweighs potential adverse impacts.

PUBLIC REVIEW AND COMMENT:

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

_____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The Refuge requires all researchers to submit a detailed Research Proposal that follows Fish & Wildlife Service guidelines (see Attachment A.3) and Service Policy (FWS Refuge Manual Chapter 4, Section 6). Researchers must allow the Refuge at least 45 days to review submitted proposals before the research can begin. If the research involves the collection of wildlife, the Refuge must be allowed 60 days to review the proposal. Researchers must obtain all necessary state and federal scientific, collecting or other required permits before commencing their research. We will prioritize and approve proposals based on the need, benefit, compatibility, and funding required for the research.

As detailed in the special conditions of their SUP, researchers are required to submit a final report to the refuge upon completing their work. A copy of any published papers, summary data, and/or documents that are the end-products of the research study, must also accompany this final report. For long-term studies, interim progress reports will be required on (at least) an annual basis. We also expect that research will be published in peer-reviewed publications. All reports, presentations, posters, articles or other publications will acknowledge the Refuge System and Back Bay NWR, as partners in the research. All posters will adhere to Service graphics standards. This should ensure that the research community, partners, and the public understand that the research could not have been conducted without the presence of the Refuge and its operational support, as well as that of the Refuge System.

Back Bay NWR will issue SUPs for all research conducted by non-Service personnel. The SUP will list the special conditions necessary to ensure compatibility, and identify a schedule for annual progress reports and the submittal of a final report or scientific paper.

The Refuge may also ask for input and review of Research Proposals by Service Regional Refuge Biologists, other Service divisions, Virginia State agencies, or academic experts.

JUSTIFICATION:

This program as described is determined to be compatible. Any potential negative impacts of research activities on Back Bay NWR resources will be minimized by the restrictions included in the SUP special conditions. In addition, the research study design and researcher activities will be regulated and monitored by Refuge staff.

The Service encourages approved research to further our understanding of refuge natural resources and management. Research by non-Service personnel adds greatly to the information base for refuge managers to make proper decisions and practice adaptive management. 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. In most cases it should supplement them.

Signature: Refuge Manager Sarah Bransom 9/1/2010
(Signature and Date)

Concurrence: Regional Chief Anthony D Léger 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

LITERATURE CITED:

U.S. Fish and Wildlife Service. 1985. *Refuge Manual.* Washington, D.C.: United States Government Printing Office.

ATTACHMENT A.3. BACK BAY NATIONAL WILDLIFE REFUGE STUDY PROPOSED GUIDELINES

A study proposal is a justification and description of the work to be done, and includes cost and time requirements. The proposals must be specific enough to serve as blueprints for the investigation. They must spell out in advance systematic plans for the investigation at a level of detail commensurate with the cost and scope of the project and the needs of management. Please submit proposals electronically as a Microsoft® Word® document or hard copy to the refuge manager.

The following list provides a general outline of first-order headings/sections for study proposals.

- Cover Page
- Table of Contents (for longer proposals)
- Abstract
- Statement of Issue
- Literature Summary
- Objectives/Hypotheses
- Study Area
- Methods and Procedures
- Quality Assurance/Quality Control
- Specimen Collections
- Deliverables
- Special Requirements, Concerns, Necessary Permits
- Literature Cited
- Peer Review
- Budget
- Personnel and Qualifications

Cover Page
The cover page must contain the following information.

- Title of Proposal
- Current Date
- Investigator's(s')—name, title, organizational affiliation, address, telephone and fax numbers and e-mail address of all investigators or cooperators.
- Proposed Starting Date
- Estimated Completion Date
- Total Funding Support Requested from the U.S. Fish and Wildlife Service
- Signatures of Principal Investigator(s) and other appropriate institutional officials

Abstract
The abstract should contain a short summary description of the proposed study, including reference to major points in the sections "Statement of Issue," "Objectives," and "Methods and Procedures."

Statement of Issue
Provide a clear precise summary of the problem to be addressed and the need for its solution. This section should include statements of the importance, justification, relevance, timeliness, generality, and contribution of the study. Describe how any products will be used, including any anticipated commercial use. What is the estimated probability of success of accomplishing the objective(s) within the proposed timeframe?

Literature Summary
This section should include a thorough but concise literature review of current and past research that pertains to the proposed research, especially any pertinent research conducted at the Back Bay National Wildlife Refuge. A discussion of relevant legislation, policies, and refuge planning and management history, goals, and objectives should also be included.

Objectives/Hypotheses
A very specific indication of the proposed outcomes of the project should be stated as objectives or hypotheses to be tested. Project objectives should be measurable. Provide a brief summary of what information will be provided at the end of the study and how it will be used in relation to the problem. These statements should flow logically from the statement of issue and directly address the management problem.

Establish data quality objectives in terms of precision, accuracy, representativeness, completeness, and comparability as a means of describing how good the data need to be to meet the project's objectives.

Study Area
Provide a detailed description of the geographic area(s) to be studied and include a clear map delineating the proposed study area(s) and showing specific locations where work will occur.

Methods and Procedures
This section should describe as precisely as possible, how the objectives will be met or how the hypotheses will be tested. Include detailed descriptions and justifications of the field and laboratory methodology, protocols, and instrumentation. Explain how each variable to be measured directly addresses the research objective/ hypothesis. Describe the experimental design, population, sample size, and sampling approach (including procedures for sub-sampling). Summarize the statistical and other data analysis procedures to be used. List the response variables and tentative independent variables or covariates. Describe the experimental unit(s) for statistical analysis. Also include a detailed project time schedule that includes start, fieldwork, analysis, reporting, and completion dates.

Quality Assurance/Quality Control
Adequate quality assurance/quality control (QA/QC) procedures help ensure that data and results are credible and not an artifact of sampling or recording errors; of known quality; able to stand up to external scientific scrutiny; and accompanied by detailed method documentation. Describe the procedures to be used to insure that data meet defined standards of quality and program requirements, errors are controlled in the field, laboratory, and office, and data are properly handled, documented, and archived. Describe the various steps (e.g. personnel training, calibration

of equipment, data verification and validation) that will be used to identify and eliminate errors introduced during data collection (including observer bias), handling, and computer entry. Identify the percentage of data that will be checked at each step.

Specimen Collections
Clearly describe the kind (species), numbers, sizes, and locations of animals, plants, rocks, minerals, or other natural objects to be sampled, captured, or collected. Identify the reasons for collecting, the intended use of all the specimens to be collected, and the proposed disposition of collected specimens. For those specimens to be retained permanently as voucher specimens, identify the parties responsible for cataloging, preservation, and storage and the proposed repository.

Deliverables
The proposal must indicate the number and specific format of hard and/or electronic media copies to be submitted for each deliverable. The number and format will reflect the needs of the refuge and the refuge manager. Indicate how many months after the project is initiated (or the actual anticipated date) that each deliverable will be submitted. Deliverables are to be submitted or presented to the refuge manager.

Deliverables that are required are as follows.

Reports and Publications
Describe what reports will be prepared and the timing of reports. Types of reports required in fulfillment of natural and social science study contracts or agreements include:

1. Progress report(s) (usually quarterly, semiannually, or annually): (may be required)
2. Draft final and final report(s): (always required).

A final report must be submitted in addition to a thesis or dissertation (if applicable) and all other identified deliverables. Final and draft final reports should follow refuge guidelines (attachment A.2).

In addition, investigators are encouraged to publish the findings of their investigations in refereed professional, scientific publications and present findings at conferences and symposia. Investigator publications will adhere to Service design standards. The refuge manager appreciates opportunities to review manuscripts in advance of their publication.

Data Files
Provide descriptions of any spatial (GIS) and non-spatial data files that will be generated and submitted as part of the research. Non-spatial data must be entered onto Windows CD-ROMs in Access or Excel. Spatial data, which includes GPS-generated files, must be in a format compatible with the refuge's GIS system (ArcGIS 8 or 9, Arcview 3.3, or e00 format). All GIS data must be in UTM 19, NAD 83. A condition of the permit will be that the Service has access to and may utilize in future mapping and management all GIS information generated.

Metadata
For all non-spatial and spatial data sets or information products, documentation of information (metadata) describing the extent of data coverage and scale, the history of where, when, and why the data were collected, who collected the data, the methods used to collect, process, or modify/ transform the data, and a complete data dictionary must also be provided as final deliverables. Spatial metadata must conform to U.S. Fish and Wildlife Service (FGDC) metadata standards.

Oral Presentations
Three types of oral briefings should be included: pre-study, annual, and closeout. These briefings will be presented to refuge staff and other appropriate individuals and cooperators. In addition, investigators should conduct periodic informal briefings with refuge staff throughout the study whenever an opportunity arises. During each refuge visit, researchers should provide verbal updates on project progress. Frequent dialogue between researchers and refuge staff is an essential element of a successful research project.

Specimens and Associated Project Documentation
A report on collection activities, specimen disposition, and the data derived from collections, must be submitted to the refuge following refuge guidelines.

Other:
Researchers must provide the refuge manager with all of the following.

1. Copies of field notes/ notebooks/ datasheets
2. Copies of raw data (in digital format), including GIS data, as well as analyzed data
3. Copies of all photos, slides (digital photos preferred), videos, films
4. Copies of any reports, theses, dissertations, publications or other material (such as news articles) resulting from studies conducted on refuge.
5. Detailed protocols used in study
6. Aerial photographs
7. Maps/GIS
8. Interpretive brochures and exhibits
9. Training sessions (where appropriate)
10. Survey forms
11. Value-added software, software developed, models

Additional deliverables may be required of specific studies.

Special Requirements, Permits, and Concerns
Provide information on the following topics where applicable. Attach copies of any supporting documentation that will facilitate processing of your application.

Refuge Assistance
Describe any refuge assistance needed to complete the proposed study, such as use of equipment or facilities or assistance from refuge staff. It is important that all equipment, facilities, services, and logistical assistance expected to be provided by the Fish and Wildlife Service be specifically identified in this section so all parties are in clear agreement before the study begins.

Ground Disturbance
Describe the type, location, area, depth, number, and distribution of expected ground-disturbing activities, such as soil pits, cores, or stakes. Describe plans for site restoration of significantly affected areas.

Proposals that entail ground disturbance may require an archeological survey and special clearance prior to approval of the study. You can help reduce the extra time that may be required to process such a proposal by including identification of each ground disturbance area on a USGS 7.5-minute topographic map.

Site Marking and/or Animal Marking
Identify the type, amount, color, size, and placement of any flagging, tags, or other markers needed for site or individual resource (e.g. trees) identification and location. Identify the length of time it is needed and who will be responsible for removing it. Identify the type, color, placement of any tags placed on animals (see special use permit for stipulations on marking and handling of animals)

Access to Study Sites
Describe the proposed method and frequency of travel to and within the study site(s). Explain any need to enter restricted areas. Describe the duration, location, and number of participants, and approximate dates of site visits.

Use of Mechanized and Other Equipment
Describe any vehicles, boats, field equipment, markers, or supply caches by type, number, and location. You should explain the need to use these materials and if or how long they are to be left in the field.

Safety
Describe any known potentially hazardous activities, such as electro-fishing, scuba diving, whitewater boating, aircraft use, wilderness travel, wildlife capture or handling, wildlife or immobilization.

Chemical Use
Identify chemicals and hazardous materials that you propose using within the refuge. Indicate the purpose, method of application, and amount to be used. Describe plans for storage, transfer, and disposal of these materials and describe steps to remediate accidental releases into the environment. Attach copies of Material Safety Data Sheets.

Animal Welfare
If the study involves vertebrate animals, describe your protocol for any capture, holding, marking, tagging, tissue sampling, or other handling of these animals (including the training and qualifications of personnel relevant to animal handling and care). If your institutional animal welfare committee has reviewed your proposal, please include a photocopy of their recommendations. Describe alternatives considered, and outline procedures to be used to alleviate pain or distress. Include contingency plans to be implemented in the event of accidental injury to or death of the animal. Include state and federal permits. Where appropriate, coordinate with and inform state natural resource agencies.

Literature Cited
List all reports and publications cited in the proposal.

Peer Review
Provide the names, titles, addresses, and telephone numbers of individuals with subject-area expertise who have reviewed the research proposal. If the reviewers are associated with the investigator's research institution or if the proposal was not reviewed, please provide the names, titles, addresses, and telephone numbers of 3 to 5 potential subject-area reviewers who are not associated with the investigator's institution. These individuals will be asked to provide reviews of the proposal, progress reports, and the draft final report.

Budget
The budget must reflect both funding and assistance that will be requested from the U.S. Fish and Wildlife Service and the cooperator's contributions on an identified periodic (usually annual) basis.

Personnel Costs
Identify salary charges for principal investigator(s), research assistant(s), technician(s), clerical support, and others. Indicate period of involvement (hours or months) and pay rate charged for services. Be sure to include adequate time for data analysis and report writing and editing.

Fringe Benefits
Itemize fringe benefit rates and costs.

Travel
Provide separate estimates for fieldwork and meetings. Indicate number of trips, destinations, estimated miles of travel, mileage rate, air fares, days on travel, and daily lodging and meals charges. Vehicle mileage rate cannot exceed standard government mileage rates if federal funds are to be used. Charges for lodging and meals are not to exceed the maximum daily rates set for the locality by the Federal Government (contact Back Bay NWR for appropriate rates).

Equipment
Itemize all equipment to be purchased or rented and provide a brief justification for each item costing more than $1,000. Be sure to include any computer-related costs. For proposals funded under US Fish and Wildlife Service agreement or contract, the refuge reserves the right to transfer the title of purchased equipment with unit cost of $1,000 or more to the Federal Government following completion of the study. These items should be included as deliverables.

Supplies and Materials
Purchases and rentals under $1,000 should be itemized as much as is reasonable.

Subcontract or Consultant Charges
All such work must be supported by a subcontractor's proposal also in accordance with these guidelines.

Specimen Collections
Identify funding requirements for the cataloging, preservation, storage, and analyses of any collected specimens that will be permanently retained.

Printing and Copying
Include costs for preparing and printing the required number of copies of progress reports, the draft final report, and the final report. In general, a minimum of two (2) copies of progress reports (usually due quarterly, semiannually, or as specified in agreement), the draft final report, and the final report are required.

Indirect Charges
Identify the indirect cost (overhead) rate and charges and the budget items to which the rate is applicable.

Cooperator's Contributions
Show any contributing share of direct or indirect costs, facilities, and equipment by the cooperating research institution.

Outside Funding
List any outside funding sources and amounts.

Personnel and Qualifications
List the personnel who will work on the project and indicate their qualifications, experience, and pertinent publications. Identify the responsibilities of each individual and the amount of time each will devote. A full vita or resume for each principal investigator and any consultants should be included here.

INTERIM FINAL REPORT GUIDELINES

Draft final and final reports should follow Journal of Wildlife Management format, and should include the following sections.

- Title Page
- Abstract
- Introduction/ Problem statement
- Study Area
- Methods (including statistical analyses)
- Results
- Discussion
- Management Implications
- Management Recommendations
- Literature Cited

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Outdoor Events

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Outdoor Events

NARRATIVE

Non-competitive outdoor events that are appropriate on the Refuge include those that incorporate compatible uses, such as walking, biking, or canoe/kayaking. These events would not be hosted by the Refuge, but rather the Refuge would participate as a partner in the event. Each request has different logistics, and therefore, would be evaluated for impacts on the Refuge mission, and a Special Use Permit is issued unless found to be detrimental to the Refuge mission.

COMPATIBILITY DETERMINATION

USE: Outdoor Events

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES
Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is non-competitive outdoor events; such as foot, bike or canoe/kayak events or fundraisers, fishing derbies, youth scavenger hunts, or virtual geo-caching. These uses are not considered priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Outdoor events are allowed in any public use "zone" of the Refuge under terms specified in a Special Use Permit. This includes the beach (excluding the North Mile) and trails at the current headquarters/visitor contact station on the barrier spit, at canoe/kayak launch facilities, and at the proposed new headquarters/visitor contact station and associated trails. This use is not permitted in more environmentally sensitive areas managed for habitat conservation or wildlife protection.

(c) When would the use be conducted?

This use is allowed whenever the zones identified in "b" above are open for public access or during closed periods if determined not to have a significant impact on natural resources. For example, we consider this use at a canoe/kayak launch facility during the closed season, just as we would permit commercial canoe/kayak operations. These events are not allowed during public hunt dates. Open periods are as follows:

- beach (excluding the "north mile") and VCS area to the south end of D-Pool (head of east and west dikes) – year round
- dike roads south of D-Pool – April 1 through October 31
- canoe/kayak launches – April 1 through October 31
- proposed new visitor contact station and trails – year round

(d) How would the use be conducted?
Each request must be presented in writing with details of who, what, where, when, why, and how the event will be conducted. Each request has different logistics, and therefore, would be evaluated for impacts on the Refuge mission. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted. Refuge staff will ensure compliance with the Permit.

(e) Why is this use being proposed?
Back Bay NWR annually receives multiple requests to conduct outdoor events. Every time the request is made, we initially evaluate the impacts of the request, and if found to be minimal, conduct a compatibility determination. Many determinations are found to be compatible. This process takes away from other priority management and administrative activities; and therefore, we propose to streamline this process by conducting one determination that generally covers this use.

Although special events may not directly contribute to the achievement of the Refuge purposes or the National Wildlife Refuge System mission, such event can contribute to the public's understanding and appreciation of the Refuge's natural resources.

AVAILABILITY OF RESOURCES

Permitting this use is within the resources available to administer our Visitor Services Program. Additional staff costs are incurred to review each request, coordinate with the outside entity and process a Special Use Permit, if necessary. Compliance with the terms of the Permit is within the regular duties of the Station Law Enforcement Officer. Anticipated costs are:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) - 1 day/yr.

= **$325**

- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (review requests, coordinate with entity, process SUP) - 3 days/yr. = **$975**
- Refuge Manager (GS-14) (review and approval) - 1 day/yr. = **$416**
- Law Enforcement Officer (GS-09) (enforcement patrols) 1 day/yr. = **$208**
- Administrative Assistant (GS-06) (issue SUP) – 1 day/yr. = **$180**

ANTICIPATED IMPACTS OF THE USE

There will be no significant negative impacts from this use; otherwise a Special Use Permit will not be issued for a specific request.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

_____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Each request must be presented in writing with details of who, what, where, when, why, and how the commercial operation will be conducted. Each request will then be evaluated for impacts to the Refuge. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted.

JUSTIFICATION

We currently allow walking, hiking, biking, fishing, hunting, wildlife observation, photography, environmental education and interpretation. Special outdoor events may not directly contribute to the achievement of the Refuge purposes or the National Wildlife Refuge System mission, but can contribute to the public's understanding and appreciation of the Refuge's natural resources. Therefore, a group event is compatible as long as it is conducted safely, and does not conflict with a priority public use, within the confines of open public use areas. It is deemed this activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established.

Signature: Refuge Manager Jared Brandwein 9/11/2018
(Signature and Date)

Concurrence: Regional Chief Anthony D Tegen 09/16/2020
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Ground Military, Police and Fire Training

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		X
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Ground Military, Police and Fire Training

NARRATIVE

The Virginia Beach/Norfolk area of Virginia has a large navy and other military presence, and is considered the east coast hub for navy operations. As a member of the Virginia Beach community, we support the needs of military and police. In addition, this use complies with Homeland Security Presidential Directive #13 which directs the Department of Interior to cooperate on inter-agency efforts to secure our maritime borders and further establishes policy, guidelines, and implementation actions involving federal, state, local, and private sector entities. Although the use does not directly contribute to the public's understanding and appreciation of natural or cultural resources, or is beneficial to our natural or cultural resources, it does not conflict with or prohibit other existing uses, including wildlife-dependent uses. Each request is treated individually, and a Special Use Permit is issued, unless found to be detrimental to the Refuge mission.

COMPATIBILITY DETERMINATION

USE: Ground Military, Police and Fire Training

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is ground military, police, and fire training. This use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Use is conducted on Refuge lands and beach front for military and police training. Also, Refuge-owned buildings that are no longer suitable or needed for Refuge purposes is permissible for military, police and fire training.

(c) When would the use be conducted?
Military beach use activities is allowed during nighttime hours, when the Refuge is closed to the public, between September 1 and April 31. As the Refuge is also proposing to allow individuals to night-time surf fish on the beach, under a Special Use Permit (select weeks October through February), night-time surf fishing will not be allowed unless and until the Refuge's current access regulations as expressed in 50 CFR 26.34 are changed to permit such access, and such fishing may

be suspended to accommodate military exercises. Military beach activities would be prohibited from May 1 to August 31 to minimize any nighttime disturbance during sea turtle nesting season.

Training on Refuge lands, excluding the beachfront, could take place year round during daylight or nighttime hours. Each request is then evaluated for impacts to the Refuge. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit is issued outlining the framework in which this use can be conducted. Fire training has stipulations regarding weather conditions before any type of burning would be allowed.

(d) How would the use be conducted?
Different branches of the U.S. military occasionally request to utilize the Refuge beach for navigation, spotting, landing and portaging watercraft across Refuge beach areas into Back Bay. This type of activity typically happens three times a year during night hours when the Refuge is closed to visitation. During this training, the number of military trainees is usually very small, often not even exceeding twelve individuals. Usually access by one or two vehicles are required or the units merely land a boat at the beach ramp area and portages, through the headquarters area into Back Bay under cover of darkness where they continue their training.

Police training typically consists of building entry, and raid training. During this training no "live" ammunitions would be stipulated along with other conditions on the special use permit. This training along with fire training would only be authorized in buildings no longer utilized for Refuge operations or housing. Fire department training could consist of the un-utilized building being burned down under a controlled training operation. A burn plan must be prepared and approved by the Refuge Manager for burning buildings.

Each request must be presented in writing with details of who, what, where, when, why, and how the operation will be conducted. Each request will then be evaluated for impacts to the Refuge. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted.

(e) Why is this use being proposed?
While this use is not a priority public use, it is important for the military, local police and fire agencies to have places to train to maintain their professional training skills. By allowing this use it strengthens relationships between the USFWS and these agencies. This use will not interfere with normal Refuge operations aside from minimal administration issuing special use permits. Some training, such as prescribed burning of buildings, would provide valuable training opportunities for the local fire department, while the Refuge would benefit with reducing the demolition cost associated with building removal. Potential impacts of this activity are analyzed below.

AVAILABILITY OF RESOURCES

Permitting this use is within the resources available by Visitor Services and Administrative staff budgets. Additional staff costs are incurred to review each request, coordinate with the outside entity and process a Special Use Permit, if necessary. Compliance with the terms of the Permit is within the regular duties of the Station Law Enforcement Officer. Anticipated costs are:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) -

1/2 day/yr. = **$175**

- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (review requests, coordinate with entity, process SUP) - 1 days/yr. = **$325**
- Refuge Manager (GS-14) (review and approval) - 1 day/yr. = **$416**
- Law Enforcement Officer (GS-09) (enforcement patrols) 1 day/yr. = **$208**
- Administrative Assistant (GS-06) (issue SUP) – 1 day/yr. = **$180**

Costs associated with local police and fire department requests would likely be higher. Factors include justifying the permanent damaging or demolition of buildings, and increased biological costs of verifying no species would be impacted by the buildings use or removal. Anticipated costs are:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) - 3 day/yr. = **$975**
- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (review requests, coordinate with entity, process SUP) - 2 days/yr. = **$650**
- Refuge Manager (GS-14) (review and approval) - 3 day/yr. = **$1248**
- Law Enforcement Officer (GS-09) (enforcement patrols) 1 day/yr. = **$208**
- Administrative Assistant (GS-06) (issue SUP) – 1 day/yr. = **$180**

While these costs are higher, the benefit of this training to the local agencies and the relationship between the agencies and the USFWS should surpass the costs associated. Costs are offset as justification to remove the unused building is still necessary if done through a private contract and federal funds instead of allowing the local police and fire departments to remove the building as training.

ANTICIPATED IMPACTS OF THE USE

The prescribed burning of buildings would result in the discharge of air pollutants, (e.g., smoke, carbon monoxide, and particulate matter) which are subject to, and must comply with, all applicable federal, state, interstate, and local air pollution control requirements. Refuge concerns revolve principally around effective smoke management that ensures the public's air quality and visibility is not reduced, particularly in the vicinity of homes and vehicle travel routes. The consideration of wind speed, direction, and mixing heights is all-important to managing smoke. In planning these activities, we would consider these factors. There will be no significant negative impacts from this use as the special use permits would strictly limit conditions around the permits' issuance; otherwise a Special Use Permit will not be issued for a specific request.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

____ **Use is Not Compatible**

__X__ **Use is Compatible With the Following Stipulations**

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Each request must be presented in writing with details of who, what, where, when, why, and how the operation will be conducted. Each request will then be evaluated for impacts to the Refuge. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted.

JUSTIFICATION

Allowing training exercises on Refuge property benefits local agencies and the relationship between the agencies and the USFWS. In general, the use does not conflict with Refuge goals and objectives, and in some cases could benefit the Refuge by reducing costs associated with demolition of unused buildings. Therefore, although this use typically is not undertaken to benefit Refuge natural and cultural resources, it obviously provides a benefit to the Refuge in relationships with local agencies who we may call on in time of need. Military exercises contribute to national security.

This use has been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. We do not expect this use to materially interfere with or detract from the mission of the National Wildlife Refuge System, nor diminish the purposes for which the refuge was established. It will not pose significant adverse effects on Refuge resources, nor interfere with public use of the Refuge, nor cause an undue administrative burden.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

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Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Commercial Filming

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Commercial Filming

NARRATIVE

One of the stated goals of the National Wildlife Refuge System is to "foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats". As long as this use complies with stipulations in a Special Use Permit, and there is no significant negative impact to the natural resources or public uses on the Refuge, this use is appropriate. Allowing commercial filming is not outlined in an approved plan; however in general, the use does not conflict with Refuge goals and objectives. Each request has different logistics, and therefore, will be evaluated for impacts on the Refuge mission, and a Special Use Permit is issued unless found to be detrimental to the Refuge mission.

Although this use typically is not undertaken primarily to promote or benefit Refuge natural and cultural resources, it can indirectly promote the Refuge when filming for news or artistic purposes. In addition, it can be good public relations for allowing local crews to conduct this use. The Service recognizes that a higher awareness and appreciation of the diversity of fish, wildlife, and plants and the interconnectedness of life on earth strengthens public support for conservation. Refuges can play an important role in raising people's understanding of wildlife and ecological processes.

COMPATIBILITY DETERMINATION

USE: Commercial Filming

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is commercial filming. This use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Commercial filming is allowed in any public use "zone" of the Refuge under terms specified in a Special Use Permit. This includes the beach (excluding the North Mile) and trails at the current headquarters/visitor contact station on the barrier spit, at canoe/kayak launch facilities, and at the proposed new headquarters/visitor contact station and associated trails. This use is be permitted in more environmentally sensitive areas managed for habitat conservation or wildlife protection.

(c) When would the use be conducted?
This use is allowed whenever the zones identified in "b" above are open for public access or during closed periods if determined not to have a significant impact on natural resources. For example, we will consider this use at a canoe/kayak launch facility during the closed season, just as we would permit commercial canoe/kayak operations. Open periods are as follows:

- beach (excluding the "north mile") and VCS area to the south end of D-Pool (head of east and west dikes) – year round
- dike roads south of D-Pool – April 1 through October 31
- canoe/kayak launches – April 1 through October 31
- proposed new visitor contact station and trails – year round

(d) How would the use be conducted?
Each request must be presented in writing with details of who, what, where, when, why, and how the commercial operation will be conducted. Each request has different logistics, and therefore, would be evaluated for impacts. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, and we can determine that the use contributes to the achievement of the Refuge purposes or the National Wildlife Refuge System mission, a commercial filming permit, signed by the Regional Director will be issued outlining the framework in which this use can be conducted. Refuge staff will ensure compliance with the Permit.

(e) Why is this use being proposed?
At least once per year (often more), Back Bay NWR receives a request to conduct this use. Every time the request is made, we initially evaluate the impacts of the request, and if found to be minimal, conduct a compatibility determination. Many determinations are found to be compatible. This process takes away from other priority management and administrative activities; and therefore, we propose to streamline this process by conducting one determination that generally covers this use.

AVAILABILITY OF RESOURCES

Permitting this use is within the resources available to administer our Visitor Services Program. Additional staff costs are incurred to review each request, coordinate with the outside entity and process a Special Use Permit, if necessary. Compliance with the terms of the Permit is within the regular duties of the Station Law Enforcement Officer. Anticipated costs are:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) - 1 day/yr. = **$325**
- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (review requests, coordinate with entity, process SUP) - 3 days/yr. = **$975**
- Refuge Manager (GS-14) (review and approval) - 1 day/yr. = **$416**
- Law Enforcement Officer (GS-09) (enforcement patrols) 1 day/yr. = **$208**
- Administrative Assistant (GS-06) (issue SUP) – 1 day/yr. = **$180**

ANTICIPATED IMPACTS OF THE USE

There will be no significant negative impacts from this use, and this use also will not negatively impact other uses; otherwise, recommendation for approval of the application will not be forwarded to the Director (see Stipulations below). This use will only be allowed in areas already open for public use; therefore, additional wildlife disturbances will be minimal, and minor disruptions to other refuge users during filming are possible.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

_____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Each request must comply with 43 CFR Part 5 and Public Law 106-206 of May 2000.
Each request must be presented in writing within 30 days of the start date, with details of who, what, where, when, why, and how the commercial operation will be conducted. The form in Attachment A.3 is prescribed for an application for permission to make a motion picture, television production, or sound track on areas administered by the U.S. Fish and Wildlife Service. Each request will then be evaluated for impacts to the Refuge. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, the request must be forwarded and approved by the Director of the Fish and Wildlife Service before the use can occur.

A bond shall be furnished, or deposit made in cash or by certified check, in an amount to be set by the official in charge of the area to insure full compliance with all of the following conditions:

i. Utmost care will be exercised to see that no natural features are injured, and after completion of the work the area will, as required by the official in charge, either be cleaned up and restored to its prior condition or left, after clean-up, in a condition satisfactory to the official in charge.

ii. Credit will be given to the Department of the Interior and the Service involved through the use of an appropriate title or announcement, unless there is issued by the official in charge of the area a written statement that no such courtesy credit is desired.

iii. Pictures will be taken of wildlife only when such wildlife will be shown in its natural state or under approved management conditions if such wildlife is confined.

iv. [Reserved]

v. Any special instructions received from the official in charge of the area will be complied with.

vi. Any additional information relating to the privilege applied for by this application will be furnished upon request of the official in charge.

If the application is approved, insurance coverage naming the federal government as a co-insured in the amount of $1 million for general liability would be required.

The Refuge shall also collect any costs incurred as a result of filming activities, including but not limited to administrative and personnel costs. All costs recovered shall be in addition to any use fee.

JUSTIFICATION

There is a considerable amount of history and natural habitat that exists on the Refuge. Allowing commercial filming is not outlined in an approved plan; however in general, the use does not conflict with Refuge goals and objectives. And, although this use typically is not undertaken for the purpose of promoting or benefitting Refuge natural and cultural resources, it can indirectly promote the Refuge when filming for artistic or news purposes. In addition, it can be good public relations for allowing local crews to conduct this use. There is also existing Departmental and agency policy and guidance that allows for, and supports this activity. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established. In addition, this activity will fulfill one or more purposes of the Refuge or the National Wildlife Refuge System.

50 CRF Part 29: We may only authorize public or private economic uses on the Refuge in accordance with 16 U.S.C. 715s, where we determine that the use contributes to the achievement of the Refuge purposes or the National Wildlife Refuge System mission.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

ATTACHMENT A.4

Date_____

To the head of the_____

Service, Department of the Interior_____
(Area)

(1) Permission is requested to make, in the area mentioned above, a_____

_____

(2) The scope of the filming (or production or recording) and the manner and extent thereof will be as follows:

Weather conditions permitting, work will commence on approximately _____

and will be completed on approximately_____

(Fully describe the scope of the filming)_____

_____
(An additional sheet should be used if necessary.)

(3) The undersigned accepts and will comply with the following conditions:

i. Utmost care will be exercised to see that no natural features are injured, and after completion of the work the area will, as required by the official in charge, either be cleaned up and restored to its prior condition or left, after clean-up, in a condition satisfactory to the official in charge.

ii. Credit will be given to the Department of the Interior and the Service involved through the use of an appropriate title or announcement, unless there is issued by the official in charge of the area a written statement that no such courtesy credit is desired.

iii. Pictures will be taken of wildlife only when such wildlife will be shown in its natural state or under approved management conditions if such wildlife is confined.

iv. [Reserved]

v. Any special instructions received from the official in charge of the area will be complied with.

vi. Any additional information relating to the privilege applied for by this application will be furnished upon request of the official in charge.

_____
(Applicant)

For_____
(Company)

Bond Requirement $_____

Approved: _____
(Date)

_____
(Title)

[22 FR 1987, Mar. 26, 1957, as amended at 36 FR 2972, Feb. 13, 1971]

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Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Weddings and Other Ceremonies

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Weddings and Other Ceremonies

NARRATIVE

One of the stated goals of the National Wildlife Refuge System is to "foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats". As long as this use complies with stipulations in a Special Use Permit, and there is no significant negative impact to the natural resources or public uses on the Refuge, this use is appropriate.

Although this use typically is not undertaken to promote or benefit Refuge natural and cultural resources, it can expose the public to the Refuge and allows the opportunity to provide appreciation of the Refuge's natural and cultural resources. Allowing ceremonies is not outlined in an approved plan; however in general, the use does not conflict with Refuge goals and objectives. Each request has different logistics, and therefore, would be evaluated for impacts on the Refuge mission, and a Special Use Permit is issued unless found to be detrimental to the Refuge mission.

COMPATIBILITY DETERMINATION

USE: Weddings and Other Ceremonies

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is performing weddings and other ceremonies. This use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
Weddings and other ceremonies are allowed in any public use "zone" of the Refuge. This includes the beach (excluding the North Mile) and trails at the current headquarters/visitor contact station on the barrier spit, at canoe/kayak launch facilities, and at the proposed new headquarters/visitor contact station and associated trails. This use is not permitted in more environmentally sensitive areas managed for habitat conservation or wildlife protection.

(c) When would the use be conducted?
This use is allowed whenever the zones identified in "b" above are open for public access, or in compliance with stipulations set forth in the Special Use Permit. Open periods are as follows:

- beach (excluding the "north mile") and VCS area to the south end of D-Pool (head of east and west dikes) – year round
- dike roads south of D-Pool – April 1 through October 31
- canoe/kayak launches – April 1 through October 31
- proposed new visitor contact station and trails – year round

(d) How would the use be conducted?
Each request must be presented in writing with details of who, what, where, when, why, and how the commercial operation will be conducted, and must comply with the stipulations listed below. Each request has different logistics, and therefore, would be evaluated for impacts on the Refuge mission. Using professional judgment, as long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit will be issued outlining the framework in which this use can be conducted. Refuge staff will ensure compliance with the Permit.

(e) Why is this use being proposed?
At least once per year (often more), Back Bay NWR receives a request to conduct this use. Every time the request is made, we initially evaluate the impacts of the request, and if found to be minimal, conduct a compatibility determination. Many determinations are found to be compatible. This process takes away from other priority management and administrative activities; and therefore, we propose to streamline the process with one determination that generally covers this use.

AVAILABILITY OF RESOURCES

Permitting this use is within the resources available to administer our Visitor Services Program. Additional staff costs are incurred to review each request, coordinate with the outside entity and process a Special Use Permit, if necessary. Compliance with the terms of the Permit is within the regular duties of the Station Law Enforcement Officer. Anticipated costs are:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) - 1 day/yr. = **$325**
- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (review requests, coordinate with entity, process SUP) - 3 days/yr. = **$975**
- Refuge Manager (GS-14) (review and approval) - 1 day/yr. = **$416**
- Law Enforcement Officer (GS-09) (enforcement patrols) 1 day/yr. = **$208**
- Administrative Assistant (GS-06) (issue SUP) – 1 day/yr. = **$180**

ANTICIPATED IMPACTS OF THE USE

There will be no significant negative impacts from this use; any ceremony request that does not comply with the stipulations below or is determined to pose a risk of significant negative impacts will not be approved and no Special Use Permit will be issued.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

_____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Each request must be presented in writing with details of who, what, where, when, why, and how the commercial operation will be conducted. Each request will then be evaluated for impacts to the Refuge.

Ceremonies are limited to a maximum of 50 participants. Standard SUP stipulations would apply, along with; no throwing of rice or flowers, no fires or lit candles, no vehicles on the beach, no dune access. No closure of any portion of the Refuge to accommodate such ceremonies. Ceremonies are permitted along the Refuge oceanfront, or at any other Refuge location with developed facilities for public access, such as Refuge piers, trails, and wildlife viewing stations, as long as the proposed use does not conflict with public use of those areas.

Bond requirement is at the discretion of the Refuge Manager, based on an analysis of the nature and scope of the event, and the associated level of risk for resource damage and anticipated cost of any restoration or repair of any damage. The permittee is responsible for site cleanup immediately following any ceremonial event. The Refuge Manager shall inspect the site prior to release of any bond.

As long as there is no significant negative impact to natural resources or visitor services, or violation of Refuge regulations, a Special Use Permit may be issued and the use allowed.

JUSTIFICATION

Back Bay NWR is located in a remote portion of an urban, coastal area. Allowing various ceremonies are not outlined in an approved plan; however in general, these one-time uses do not conflict with Refuge goals and objectives. Individuals that request this use must already have an appreciation for the outdoors, whether it is the beach, bay or wooded areas, or just the fresh air. Therefore, although this use typically is not undertaken to benefit Refuge natural and cultural resources, it obviously provides participants an appreciation, or at least exposure to outdoor environments. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Parking and Connecting Access to Horseback Riding

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Parking and Connecting Access to Horseback Riding

NARRATIVE

In the Draft CCP/EA, Alternative C proposes to provide a parking area/trail head at the proposed new HQ/VCS (Tract 244) for horse trailers and connecting access to adjacent neighborhood horse trails. Horseback riding on the Refuge barrier spit is not appropriate (see Horseback Riding Appropriateness checklist). In order for this use to be compatible, our administrative HQ facility needs to be moved to that locale, riding on the Refuge would need to be kept to a minimum to connect to neighborhood trails, horses would have to be diapered (to eliminate effects of droppings), and a proper parking facility would need to be constructed.

COMPATIBILITY DETERMINATION

USE: Parking and Connecting Access to Horseback Riding

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is to provide parking and connecting access to neighborhood horseback riding. This is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
In the Draft CCP/EA, Alternative C proposes to provide a parking area/trail head at the proposed new headquarters and Visitor Contact Station on Tract 244 for horse trailers and connecting access to adjacent City and neighborhood horse trails.

(c) When would the use be conducted?
This use would not be permitted until (1) the City and neighborhood trails are established, and (2) our administrative headquarters facility was established at or adjacent to Tract 244. The use would be allowed on Refuge property from sunrise to sunset, and according to rules and regulations established by the City and the neighborhood developers, and approved for Refuge use.

(d) How would the use be conducted?
The use would be conducted in cooperation with the City of Virginia Beach and neighborhood developers adjacent to the Refuge. In order to adequately manage this use, our administrative headquarters facility needs to be moved to that locale and riding on the Refuge will be kept to a minimum, connecting trails with the most direct route possible. Horses would be required to be diapered (to eliminate effects of droppings) and a proper parking facility and comfort station provided. No use fee would be required, as we would not require one to access the new Visitor Contact Station area. However, donations would be encouraged.

(e) Why is this use being proposed?
Back Bay NWR is constantly pressured to open the Refuge to horseback riding. The primary reason public horseback riding is found inappropriate on the barrier spit is because the Refuge does not have the infrastructure and staff resources to manage the use. With additional resources to provide this use, it can be managed, in cooperation with the City.

AVAILABILITY OF RESOURCES

The Refuge currently does not have the resources to provide this use. Funding from private sources or the City of Virginia Beach would likely be required to provide the parking and comfort facilities for this use, as considerable Refuge funding increases are not likely. Minimum funding needed is estimated at $200,000. Once facilities are established, staff resources needed to manage the use fit within the Station's budget.

ANTICIPATED IMPACTS OF THE USE

The area proposed for a parking and staging area on the western boundary of the Refuge on Tract 244 is previously farmed land that currently has minimal wildlife values other than as a buffer zone between new developments and the Refuge. Providing a connection for access to future non-Refuge trails would not result in adverse impacts to habitat. Potential impacts that may be predicted from uncontrolled horseback travel on Refuge habitat include: soil compaction and erosion, downstream sedimentation, trampling and mortality of fragile plant communities, habitat loss/deterioration, wildlife disturbance, hydrologic changes and a shift in plant communities along trails. These potential impacts as reported in the literature and through in-field investigation and observation at another Northeast Refuge are listed below:

Impacts to plants: Horse travel can impact plants on trails by directly crushing them. Indirectly, horses can impact plants by compacting soils diminishing soil porosity, aeration and nutrient availability (Kuss 1986). Hammitt and Cole (1998) note, compaction limits the ability of plants to re-vegetate affected areas. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Moist and wet soil conditions are common in Canaan Valley particularly during spring and early summer and can occur on upland trails that have been incised and are channeling water.

Horse use may cause local impacts to plants and soils when confined. West Virginia Conservation Officer Harold Spencer observed that tying horses to trees damaged plants and soils. Confined horses in Canaan Valley ate the bark of nearby trees. This occurred at upland camps where horses were left for extended periods (Spencer 2002). According to Cole (1983), bark damage from

tethering horses to trees can result in insect invasions and girdling that can ultimately kill the tree. Soil compaction and erosion at these sites was also cited as a problem, especially where it exposed tree roots (Cole 1983). Erosion from horse hooves may increase root exposure.

Soil Impacts: Horses cause soil compaction, particularly when soils are wet which can directly affect plant growth and survival (Kuss 1986). Horseback riding has been found to cause braided trails in excessively muddy trail sections (Summer 1986). Weaver and Dale (1978) found horse use caused a greater loss of vegetation cover, wider and deeper trails, and greater soil compaction when compared to hiker use on meadow and forest trail conditions. Horses may cause trail erosion by loosening the soil and increasing soil particle detachment under both wet and dry trail conditions (Deluca et al 1998).

Field investigations of trails in Canaan Valley have documented extensive damage displaying classic examples of the erosive nature of Mauch Chunk derived soils after years of unregulated use. In addition, many trails are now trapping and channeling water creating more erosive conditions.

Kuss (1986) found that increasing moisture content of soils reduces the ability of the soil to support traffic. Summer (1986) recommended that horse trails be established on dry, well-drained sites. Routine maintenance to remove water and repair existing erosion is required to sustain horseback travel on most routes on the Main Tract (Rizzo 2002, Zeedyk 2002).

Invasive Species: Exposed soil and an abundance of sunlight along roads and trails provide ideal conditions for the establishment of invasive plant species. Invasive plant species may be transported through the presence of non-native plant seeds in feed hay. This concern has initiated strict requirements for "weed free" hay in some natural areas. At Yellowstone National Park and Green Mountain and Fingerlakes National Forests in New York only processed feed (pelletized or cubed hay) or certified "weed seed free" hay is allowed in the back country (Oliff 2001, Zimmer 2001).

Hydrologic Impacts: Roads and trails used for horseback travel can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert water from their original drainage patterns. This results in some drainages becoming dry while others accelerate erosion by being forced to carrying more water. Zeedyk (2002) documented many instances in Canaan Valley where existing trails were channeling water away from historic wetlands and in some cases causing erosion and sedimentation of bog and other wetland communities. These problems have profoundly if not irreversibly altered the extent, depths, characteristics and function of the wetlands on the Main Tract (Zeedyk 2002).

Wildlife Impacts: Horseback travel can cause disturbances to wildlife. Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year such activities occur. Whittaker and Knight (1998) note that wildlife response can include attraction, habituation and avoidance. These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat.

Trails can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where American robins were found near trails and specialist species (i.e. grasshopper sparrows) were found farther from trails. Nest predation was also found to be greater near trails (Miller et. al 1998).

Disturbance can cause shifts in habitat use, abandonment of habitat and increase energy demands on affected wildlife (Knight and Cole 1991). Flight in response to disturbance can lower nesting productivity and cause disease and death. Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through unintentional harassment.

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more impacts during breeding season and winter months.

Wildlife disturbance from horse use has been cited for trail closures in West Virginia. A trail was closed at the Bluestone Wildlife Management Area due to anticipated impacts of disturbance to wild turkey populations (Silvester 2001).

Impacts to wildlife may be indirectly caused through erosion and subsequent sedimentation of streams and vernal pools. Increased sediment loads can reduce aquatic vegetation and dissolved oxygen concentrations (Sadoway 1986). Sedimentation can directly kill aquatic invertebrates in which impacts the success of amphibian larvae and adults (Sadoway 1986). Observations by Refuge staff in 2002 document numerous occurrences of amphibian egg masses that failed after becoming coated in sediment from eroding trails and roads nearby. Bartgis and Berdine (1991) report that sedimentation was damaging habitat in Canaan Valley and could cause impacts to the rare plants, water quality and possibly affect habitat of the southern water shrew (*Sorex palustris punctulatus*), a state Species of Concern.

User Conflicts: Conflicts between trail users are commonly reported in the literature (Knight and Gutzwiller 1995, Ramthun 1995, Watson et. al 1994, Chavez et al. 1993). Conflicts range from concerns over personal safety to certain user groups feeling that they should be given priority over other groups based on a past history or other reasons. Providing safe routes for wildlife-oriented activities is an important consideration for wildlife observation trails on the Refuge. Safety considerations include ability of multiple modes of access to use a trail without creating dangerous conditions, ability to maintain a trail to allow safe use and timing of various uses such as wildlife observation.

This use would provide a positive impact on public relations and community cooperation with the City.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION (CHECK ONE BELOW):

___ **Use is Not Compatible**

_X_ **Use is Compatible With the Following Stipulations**

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

In order for the use to be compatible, the City and neighborhood trails need to be established and our administrative headquarters facility needs to be moved to that general locale. Horses would have to be diapered (to eliminate effects of droppings) and a proper parking facility is constructed.

JUSTIFICATION

Horseback riding provides a means to observe wildlife and take photos, just like walking, hiking, and biking. Establishing a separate trail to conduct this use is compatible, with the appropriate infrastructure to support it. This proposed use would be in partnership with the City of Virginia Beach, as they too are looking for areas to provide this use. This activity will not materially interfere with or detract from the mission of the NWRS or purposes for which Back Bay NWR was established.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/16/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: 09/16/2020
(Date)

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603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Cooperative Farming

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		X
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 9/2/2010

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Cooperative Farming

NARRATIVE

The Refuge Cooperative Farming Program is an integral component of the Refuge's overall habitat restoration and management efforts. In lieu of paying rent for the use of Refuge farm fields, the cooperators support the accomplishment of Refuge habitat management objectives by performing farming-related services associated with our annual habitat management program and activities.

With the City of Virginia Beach experiencing an explosive development boom, wooded habitats have been disappearing rapidly. Refuge staff have decided that the Refuge can best contribute to the overall landscape picture by replacing some lost wooded habitats, with more valuable, and less common, mast-producing native trees that used to exist prior to the agricultural and housing conversions of the past fifty years. The cooperators have assisted with field preparation, planting, mowing, disking, and invasive species control to help establish new native forest restoration areas that were originally agricultural.

The use of cooperative farming as an interim measure will keep fields open in preparation for conversion to native plant communities and will keep the fields relatively invasive-free in preparation for conversion to native plants.

COMPATIBILITY DETERMINATION

USE: Cooperative Farming

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES:

Executive Order No. 7907 on June 6, 1938; Migratory Bird Conservation Act (16 U.S.C. 715-715r); Emergency Wetlands Resources Act of 1986 (100 Stat. 3582-91).

REFUGE PURPOSES:

- "…as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "….for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "… the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…" (16 U.S.C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats with in the United States for the benefit of present and future generations of Americans" (Pub. L. 105-57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The use is cooperative farming. Cooperative farming is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?
We allow this use on existing and newly acquired Refuge lands that were in an agricultural state at the time of acquisition. In some cases, the property acquisition was contingent on permitting the existing farming program to continue (for a limited time). Where we do not require farming to accomplish Refuge purpose(s), we cease farming and strive to restore natural habitats.

(c) When would the use be conducted?
Farming occurs all year long via planting and harvesting of corn and soybeans only. Corn is typically planted in late spring and harvested in late summer through early fall. Soybeans are planted in late spring/early summer, and harvested in late fall through early winter. Application of fertilizer, lime, and pesticides occurs before and after planting, but prior to harvest.

In this Comprehensive Conservation Plan, the Refuge cooperative farming program is to be phased out entirely within five years, unless habitat management objectives are not met or other unforeseen circumstances arise (see letter "e" below). This is to meet provisions of the National Wildlife Refuge System Improvement Act concerning compatibility and the biological integrity, diversity and environmental health of the Refuge System (Integrity Policy). The Integrity Policy directed that refuge habitats be managed to support historic conditions, defined as the "composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human related changes to the landscape." Further, the policy states that "we do not allow refuge uses or management practices that result in the maintenance of non-native plant communities unless we determine there is no feasible alternative for accomplishing refuge purpose(s)."

(d) How would the use be conducted?
The Refuge manages the farming program through a written cooperative agreement with a local farmer, and follow Refuge Manual guidance (US Fish and Wildlife Service. 2001) in selecting the farmer with whom we enter into an agreement. The Agreement will be revisited and, if necessary be revised on a biannual basis (every two years); after which it will be signed by both the Cooperative Farmer and the Refuge Manager. Field rental rates are determined by taking the average of rental rates from the local area.

Rather than making cash payments, the cooperator conducts farming-related services on Refuge habitats that are managed to meet the needs of migrating and wintering water-birds. Those services are calculated at an agreed-upon cost that will be annually deducted from the Refuge rent. Farming-related services eligible for inclusion into the agreement are: planting, disking, mowing, root-raking and applying herbicide. The cooperative farming agreement is a component of the Refuge's Annual Habitat Management Program. Activities conducted by the cooperator help meet Refuge habitat management objectives.

The Refuge follows best management practices during implementation of the cooperative farming program. Forested or grass buffers are established between all farm fields and any adjacent wetlands, deep ditches and streams. "No-till" practices are also employed to the maximum extent possible. Pesticide Use Proposals for application of all pesticides are prepared, and only those that are shown to not impact fish and wildlife resources are approved.

In keeping with FWS policy and our own conviction, we will not seek approval to use genetically modified (GMO) crops; principally because of the potential conflicts they pose with native species and adjacent, private non-GMO crops of this area.

(e) Why is this use being proposed?
Originally established as a 4,570-acre National Wildlife Refuge in 1938, Back Bay NWR began expanding during the late 1980s through today to its current 9,200 acres. When fully acquired, the Refuge will total 11,007 acres. Much of the acquired acreage was natural Back Bay wetlands; however, a considerable portion now includes former or current agricultural (row crop) lands. The Refuge proposes to use cooperative farming as an interim measure to keep fields in an early-successional state, in preparation for conversion to vanishing native plant communities

(principally forest and shrub-scrub habitats) or for wetland restoration projects (moist-soil units/ impoundments). US Army Corp of Engineers regulations require that the ground be turned over at least once every 4-5 years if restoration work is to be authorized. Otherwise the land reverts to a prior-converted wetlands status that precludes disturbance to such formerly farmed soils. This effectively eliminates a number of wetlands restoration options involving any disturbance to the topsoil. Keeping the land in a farming status prevents the loss of these options. In addition, these lands, if taken out of agricultural production and not immediately prepared for native habitat restoration, may become infested with invasive plant species, making reclamation of these fields much more difficult and expensive. These have been the primary justifications for cooperative farming since its inception in the early 1990's (soon after establishment of the relatively new Refuge acquisition boundary).

Our cooperative farming program is an integral component of our overall habitat restoration and management efforts; however, because we are still in the process of fully restoring former agricultural fields, we are not in the position to undertake new restoration of the existing 101 acres still in row crop production. We propose to keep lands in agricultural production until we can successfully restore them to native wetlands or forest habitats. We believe this can be accomplished in a five year period with the continued assistance provided through the cooperative farming agreements.

Acquiring land from willing sellers often is contingent on maintaining an existing farming operation. This is amenable because as Back Bay NWR acquires new lands or as we identify currently-owned tracts for restoration, we may need to use the cooperative farming program as an interim measure prior to habitat restoration (as described above).

In addition, the existing agricultural fields do have value as foraging areas for birds throughout the year. Large numbers of Canada geese (~500) and Snow geese (~1,500) have been observed feeding on waste grain in corn and soybean fields after their harvests. A variety of songbirds including the Eastern meadowlark, have been observed feeding in corn and soybean stubble, as well as growing soybeans fields.

When viewed in the context of the overall Refuge purpose, habitat management status and capabilities of Back Bay NWR, cooperative farming as is practiced at Back Bay NWR, and for the limited duration proposed, contributes to the purposes of the Refuge and the mission of the Refuge System. It does so by adding to the Refuge's ability to successfully restore and manage native habitats over the long term.

AVAILABILITY OF RESOURCES:

With the exception of staff time necessary to administer it, the cooperative farming program is self-sustaining. The disking, planting, mowing, herbicide application, and other farming practices are conducted in exchange for use of the 101 acres for agricultural production.

ANTICIPATED IMPACTS OF THE USE:

Impacts from implementing a cooperative farming program are primarily of a positive nature; however, there are minimal negative impacts from this use. These negative impacts, although present, are minimized by requiring farmers to implement best management practices (see Stipulations To Ensure Compatibility below). Below is an outline of impacts.

POSITIVE IMPACTS

Short-term:

- Farmer's equipment resources are available to Refuge for habitat management needs.
- Increased habitat management acreages achieved annually, allowing Refuge to accomplish its goals and mission.
- Increased wetlands and forested habitat restoration acreage achieved.
- Waste grain provides an additional fall and winter food for migratory waterfowl, game bird and migratory songbird populations.
- Reduces occurrence of invasive or other pest species (since farmer controls them).

Long-term:

- Increased water-bird use of Refuge habitat resources.
- Healthier migratory bird populations during the fall and winter seasons.
- Keeps land in a prior-converted (PC) state by having soil turned over annually; since that action keeps restoration possibilities open that involve soil disturbance.

NEGATIVE IMPACTS

Short-term:

- Minimal turbidity to the Back Bay Watershed.
- Diminished biodiversity in farmed areas.
- Possible increased nutrient-loading into the Back Bay Watershed.

Long-term:

- Declining water quality.
- Discouragement of submerged aquatic vegetation (SAV) recovery in Back Bay.

PUBLIC REVIEW AND COMMENT:

A public notice announcing the availability of this determination for a 21-day public review and comment period was printed in The Virginian Pilot and posted via the following outlets on December 21, 2006:

The Virginia Pilot
Pungo Civic League Membership
Back Bay Restoration Foundation Membership
BBNWR Visitor Contact Station
Friends of Back Bay NWR

In addition, it was brought to our attention to have this draft determination sent to the Virginia Beach Farm Bureau and Virginia Beach Department of Agriculture. This was done on December 29, 2006, and therefore provided the same 21-day comment period for these entities.

During the public comment period, we received two letters; one each from the Virginia Beach Farm Bureau and Virginia Beach Agriculture Advisory Commission. Both letters expressed similar opinions that cooperative farming should remain a long-term use of the Refuge. Both groups also had concerns regarding changing drainage patterns and that eliminating cooperative farming would negatively impact future land acquisitions. Lastly, the Farm Bureau expressed concern for fire safety and requested a buffer be maintained between natural re-growth or reforested areas and individual homes.

The Biological Integrity Policy requires refuge land management programs to contribute primarily and directly to attainment of Refuge System goals and objectives. Although secondary benefits exist, unfortunately, farming's primary objective is raising agricultural crops for the farmer and therefore is not compatible over the long term. However, we recognize that there may be some cooperative farming occurring on the Refuge beyond the five-year window described. If new lands are acquired, for example, they may be temporarily enrolled in a cooperative farming program while plans are made and implemented to restore them to native habitats.

The Refuge Manager will provide responses to the two groups who wrote letters commenting on the draft determination, explaining the final decision.

DETERMINATION (CHECK ONE BELOW):

____ Use is Not Compatible

__X__ Use is Compatible With the Following Stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The program will adhere to the general conditions for cooperative farming programs listed in the Refuge Manual (6 RM 4 Exhibit 1). In addition, all Refuge farming operations are to be carried out in accordance with best available farming and soil conservation practices.

Other stipulations outlined in each Cooperative Farming Agreement are:

- Insecticide applications may only occur upon demonstration of an infestation, must have the approval of the Refuge Manager, and must adhere to the listing of herbicides and pesticides approved for use by FWS on Refuge lands;
- The cooperator is required to provide a one page "Annual Summary Report of Lime, Fertilizer, Pesticide and Planting Dates;"
- Cooperator agrees not to discourage, in any way, field feeding by Canada and snow geese. If significant crop damage occurs, the Refuge will renegotiate the agreement to compensate the cooperator for lost revenue;
- The use of genetically modified (GM) plants and seed are prohibited; and,
- All farming activities must maintain a minimum distance from all ditches and waterways.

JUSTIFICATION:

The Refuge Cooperative Farming Program is an integral component of the Refuge's overall habitat restoration and management efforts. In lieu of paying rent for the use of Refuge farm fields, the cooperators support the accomplishment of Refuge habitat management objectives by performing farming-related services associated with our annual habitat management program and activities. We have converted approximately 75 acres into native hardwoods or shrubs through planting or natural revegetation and plan on converting an additional 139 acres of old field/early successional habitat into native hardwoods; while well over 1,000 acres have been restored to wetlands status as the Frank Carter Impoundments (26a.) and five other wetlands restoration projects (1,000a.). Refuge biologists have used the cooperative farming agreement to help achieve these habitat management activities. With the City of Virginia Beach experiencing an explosive development boom, wooded habitats have been disappearing rapidly. Refuge staff have decided that the Refuge can best contribute to the overall landscape picture by replacing some lost wooded habitats, with more valuable, and less common, mast-producing native trees that used to exist prior to the agricultural and housing conversions of the past fifty years. The cooperators have assisted with field preparation, planting, mowing, disking, and invasive species control to help establish new native forest restoration areas that were originally agricultural. In addition, cooperative farmers have helped establish and maintain new Refuge wetland restoration sites, and maintain the existing 880 acre impoundment complex.

The use of cooperative farming as an interim measure will keep fields open in preparation for conversion to native plant communities and will keep the fields relatively invasive-free in preparation for conversion to native plants.

The Refuge has also maintained the support of the local farming community through the cooperative farming program. Support of the local farming community will assist in the purchase of additional lands within the Refuge acquisition boundary that are currently in an agricultural state.

In accordance with 50 CFR 29.1, cooperative farming, as described in this compatibility determination, contributes to the mission, purposes, goals, and objectives of Back Bay NWR and the National Wildlife Refuge System mission.

Signature: Refuge Manager _____ 9/1/2010
(Signature and Date)

Concurrence: Regional Chief _____ 09/17/2010
(Signature and Date)

Mandatory 10-year re-evaluation date: January 2017

LITERATURE CITED:

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FINDINGS OF APPROPRIATENESS FOR THOSE SECONDARY USES WHICH WERE FOUND NOT APPROPRIATE

- Commercial Fishing
- Horseback Riding
- Launching of Trailered Vessels
- Picnicking
- Swimming, Surfing, and Sunbathing on the Refuge Beach
- Off-Road Vehicle Access (excluding Motor Vehicle Access Permit Program)
- Dog Walking

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Commercial Fishing–Bay Side Property

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X[1]	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes _____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** _____

Refuge Manager: Sara Zambrano Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

1 The Refuge only has jurisdiction over commercial fishing on its bay side property; it does not have jurisdiction over commercial fishing on its oceanfront property.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Commercial Fishing – Bay Side Property

NARRATIVE

The Refuge does not have the resources to administer this use on the bay-side property.

As noted, the Refuge does not have jurisdiction over commercial fishing on its oceanfront property; however, commercial fishing off the beach is allowed by specific individuals as mandated by the Motor Vehicle Access Permit Program authorized by Congressional law.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Horseback Riding

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** _____

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Horseback Riding

NARRATIVE

The Refuge does not have the parking space to support trailers in our parking areas, therefore trailers are prohibited. The entrance road can not safely accommodate cars, horses, hikers and bikers. In addition, the north end of the Refuge beach ("North Mile") is closed to all public uses. If this use was found appropriate and compatible, Back Bay NWR would be the only area in Virginia Beach to allow "public" horseback riding. Therefore, it can be expected to be a heavy use; which Refuge staff do not have the resources to manage properly. It would add significantly to the workload of law enforcement, visitor services, and maintenance staff. Horseback riding requires active and frequent management and monitoring, as well as trails maintenance (see below impacts). Finally, horseback riding is not considered to be a "Big 6 Activity" by the U.S. Fish & Wildlife Service. Refuges are encouraged to support and increase Big 6 Activities (Interpretation, Environmental Education, Hunting, Fishing, Wildlife Photography and Wildlife Observation). Permitting horseback riding would be contrary to this policy.

Some of the above limitations to horseback riding of the existing Refuge infrastructure are addressed elsewhere in this CCP, however, critical issues can be summarized in this document. Potential impacts of horseback travel include: soil compaction and erosion, downstream sedimentation, trampling and mortality of fragile plant communities, habitat loss/deterioration, wildlife disturbance, hydrologic changes, invasive plant species introductions, and a shift in plant communities along trails. These potential impacts are listed below, as reported in the literature and through investigations and observations at another northeastern (Region 5) refuge (Canaan Valley National Wildlife Refuge [Canaan Valley NWR]):

Impacts to plants: Horse travel can negatively impact beneficial plants on trails by directly crushing them. Indirectly, horses can impact plants by compacting soils; thereby diminishing soil porosity, aeration and nutrient availability (Kuss. 1986). Hammitt and Cole (1998) note, compaction limits the ability of plants to re-vegetate affected areas. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss. 1986). Moist and wet soil conditions are common on Back Bay NWR, particularly during spring and early summer. Wet soil conditions can also occur on upland trails that have been incised by horse's hooves and channel rain-water.

Horse use may cause local impacts to plants and soils when confined. West Virginia Conservation Officer Harold Spencer observed that tying horses to trees damaged plants and soils. Confined horses in the Canaan Valley NWR ate the bark of nearby trees. This occurred at upland camps where horses were left for extended periods (Spencer. 2002). According to Cole (1983), bark damage from tethering horses to trees can result in insect invasions and girdling that can ultimately kill the tree. Weaver and Dale (1978) found horse use caused a greater loss of vegetation cover.

Soil Impacts: Soil compaction and erosion at camping and tethering sites was also cited as a

problem in West Virginia, often resulting in exposure of tree roots (Cole. 1983). Erosion from horse hooves may increase root exposure. Horses cause soil compaction, particularly when soils are wet which can directly affect plant growth and survival (Kuss. 1986). Horseback riding has been found to cause braided trails in excessively muddy trail sections (Summer. 1986). Weaver and Dale (1978) found horse use caused wider and deeper trails, and greater soil compaction; when compared to hiker use on meadow and forest trail conditions. Horses may cause trail erosion by loosening the soil and increasing soil particle detachment under both wet and dry trail conditions (Deluca et al. 1998). Field investigations of horse trails in Canaan Valley have documented extensive damage from years of unregulated use; many trails are trapping and channeling water and eroding away.

Kuss (1986) found that increasing moisture content of soils reduces the ability of the soil to support traffic. Summer (1986) recommended that horse trails be established on dry, well-drained sites. Routine maintenance to remove water and repair existing erosion is required to sustain horseback travel on most routes (Rizzo. 2002; Zeedyk, 2002).

Invasive Species: Exposed soil and an abundance of sunlight along roads and trails provide ideal conditions for the establishment of invasive plant species. Invasive plant species may be transported through the presence of non-native plant seeds in feed hay, as well as browsing on non-natives. This concern has initiated strict requirements for "weed free" hay in some natural areas. At Yellowstone National Park and Green Mountain and Fingerlakes National Forests in New York only processed feed (pelletized or cubed hay) or certified "weed seed free" hay is allowed in the back country (Oliff. 2001; Zimmer. 2001).

Hydrologic Impacts: Roads and trails used for horseback travel can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert surface water from their original drainage patterns. This results in some drainages becoming dry, while others accelerate erosion as they transport more water. Zeedyk (2002) documented many instances in Canaan Valley where existing trails were channeling water away from historic wetlands and in some cases causing erosion and sedimentation of bog and other wetland communities. These problems have profoundly, if not irreversibly, altered the extent, depths, characteristics and function of involved wetlands (Zeedyk. 2002).

Wildlife Impacts: Horseback travel can cause disturbances to wildlife. Disturbances vary with the wildlife species involved and the type, level, frequency, duration and time of year such activities occur. Whittaker and Knight (1998) note that wildlife response can include attraction, habituation and avoidance. These responses can have negative impacts to wildlife; such as mammals becoming habituated to humans, making them easier targets for hunters. Human-induced avoidance by wildlife can prevent animals from using otherwise suitable habitat.

Trails can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998; Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails; American robins were found near trails and specialist species (i.e. grasshopper sparrows) were found farther from trails. Nest predation was also found to be greater near trails (Miller et. al. 1998).

Disturbance can cause shifts in habitat use, abandonment of habitat and increased energy demands on affected wildlife (Knight and Cole 1991). Flight in response to regular disturbances can lower nesting productivity and cause disease and death to resident birds. Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans

in wildland areas can dramatically change the normal behavior of wildlife mostly through unintentional harassment.

Seasonal sensitivities can compound the effect of disturbances to wildlife. Examples include regularly flushing birds during nesting; or causing mammals to flee during winter months; resulting in the consumption of stored fat reserves necessary to survive. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more impacts during breeding seasons and winter months.

Wildlife disturbance from horse use has been cited as a reason for trail closures in West Virginia. A trail was closed at the Bluestone Wildlife Management Area due to anticipated negative impacts to wild turkey populations (Silvester 2001).

Impacts to wildlife may be indirectly caused through erosion and subsequent sedimentation of streams and vernal pools. Increased sediment loads can reduce aquatic vegetation and dissolved oxygen concentrations (Sadoway 1986). Sedimentation can directly kill aquatic invertebrates; which negatively impacts the success of amphibian larvae and adults (Sadoway 1986). Observations by Canaan Valley NWR staff in 2002 document numerous occurrences of amphibian egg masses that failed after becoming coated with sediments from nearby eroding trails and roads. Bartgis and Berdine (1991) report that sedimentation was damaging habitat in Canaan Valley and could cause impacts to the rare plants, water quality and habitat of the Southern water shrew (Sorex palustris punctulatus), a state Species of Concern. Fish species also suffer mortality and disease as a result of stream sedimentation.

User Conflicts: Conflicts between trail users (hikers, bikers, horse-back riders, wildlife photographers and birdwatchers) are commonly reported in the literature (Knight and Gutzwiller 1995, Ramthun 1995, Watson et. al 1994, Chavez et al. 1993). Conflicts range from concerns over personal safety to certain user groups feeling that they should be given priority over other groups based on a past history or other reasons. Providing safe routes for wildlife-oriented activities is an important consideration for wildlife observation trails on the Refuge. Safety considerations include ability of multiple modes of access to use a trail without creating dangerous conditions, ability to maintain a trail to allow safe use and timing of various uses such as wildlife observation.

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603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Launching of Trailered Vessels

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** _____

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Launching of Trailered Vessels

NARRATIVE

The Refuge supports priority public uses of Back Bay, such as hunting and fishing; however, the Refuge does not have the infrastructure to support trailers in our parking areas to facilitate these uses. In addition, trailered vessels tend to be larger, motorized vessels, which have greater tendencies to erode sensitive marsh shoreline with their wakes, disturb nesting birds, and re-suspend bottom sediments. These effects reduce water quality and SAV production, which is contrary to Refuge goals and objectives. Also, large, recreational motorboats can diminish quality wildlife-dependent experiences due to the noise disturbance.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Picnicking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** ____

Refuge Manager: [signature] Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Picnicking

NARRATIVE

Back Bay NWR does not provide the amenities for picnicking activities, such as picnic tables, shelters, excessive trash containers, grills, etc. In addition, we do not have the resources to manage a large picnic area or program. However, the determination that picnicking is not an appropriate use does not preclude visitors from bringing food for nutrition/safety while participating in wildlife-dependent recreation.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Swimming, Surfing, and Sunbathing on the Refuge Beach

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		X
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes _____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** _____

Refuge Manager: _____ Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Swimming, Surfing, and Sunbathing on the Refuge Beach

NARRATIVE

Back Bay NWR has 5 miles of beach habitat along the Virginia Beach coast. The Refuge already receives 100,000 visitors annually, of which 75% occurs in the summer when tourists are in town for "fun in the sun." The beach was closed to these uses in the late 1980's to protect the beach habitat for wildlife. There is approximately 50 miles of public beach in Virginia Beach to conduct these uses. The Refuge does not have the facilities or staff to manage these uses.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Off-Road Vehicle Access (excluding Motor Vehicle Access Permit Program)

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?		X
(d) Is the use consistent with public safety?		X
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		X
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ____ No X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** ____

Refuge Manager: Jared Bransheim Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Off-Road Vehicle Access (not in Motor Vehicle Access Permit Program)

NARRATIVE

50 CFR Sec 26.34 General Rules (n) states that "Entry on foot, bicycle or motor vehicle on designated routes is permitted one half-hour before sunrise to one-half hour after sunset for the purposes of nature observation and study, photography, hiking, surf fishing, and bicycling." Furthermore, 50 CFR Sec 26.334 (s)(3) states "Registered motor vehicles and motorized bicycles (mopeds) are permitted on the paved refuge access roads and parking lot at refuge headquarters. All other motorized vehicular use is prohibited, except as specifically authorized pursuant to this rule."

The use of motorized vehicles that are off-road would therefore be prohibited. The use of off-road vehicles is also not appropriate because they cause habitat destruction and disturbance to wildlife. The Refuge also lacks the staff resources to manage this use.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Dog Walking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?		X
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		X
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ("no" to [a]), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to [b], [c], or [d]) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** _____

Refuge Manager: Jared Brandwein Date: 9/1/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Back Bay NWR

Use: Dog Walking

NARRATIVE

The Refuge has re-examined and evaluated our existing policy on dog walking to better meet the needs of our public while also minimizing wildlife disturbances. Since the Refuge mission consists of providing habitats for wintering and migrating birds that include waterfowl, shorebirds, wading birds, marshbirds and landbirds, minimizing those uses that provide the greatest potential conflicts and disturbances to those migratory bird species is a priority. Dogs have been shown by recent research to displace native migratory bird species from the natural habitats that Back Bay NWR was established to provide (Banks & Bryan. 2007; Fernandez-Juricic and Telleria. 2000).

Minimizing negative impacts to other associated wildlife species (deer, raccoon, fox, opossum, black bear, bobcat and coyote) that also share many of these same habitats is also a responsibility of Refuge staff. Research has revealed that dog presence results in definite predator-type defense reactions by these native wild mammals, including avoidance/vacating the area (Lima et al.1999; Mitchell & Banks. 2005; Lenth, et al. 2006.)

This determination does not extend to the use of (dog) retrievers by waterfowl hunters engaged in legal waterfowl hunting in those areas of Back Bay NWR that are opened to waterfowl hunting in the future.

Hunting with a retriever is a much less frequent occurrence than general dog walking , which presumably could occur daily and result in far greater negative impacts to wildlife and habitat. Furthermore, hunting is a priority public use of the National Wildlife Refuge System, and the use of retriever dogs helps to facilitate the use while minimizing potential negative impacts during waterfowl hunts.

COMPATIBILITY DETERMINATION

USE: Dog Walking

REFUGE NAME: Back Bay National Wildlife Refuge

ESTABLISHING AND ACQUISITION AUTHORITIES

Executive Order No. 7907 dated June 6, 1938; Migratory Bird Conservation Act (16 USC 715-715r); Emergency Wetlands Resources Act (100 Stat. 3582-91).

REFUGE PURPOSES

- "...as a refuge and breeding ground for migratory birds and other wildlife" (E.O. 7907).
- "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d, Migratory Bird Treaty Act).
- "... the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions..." (16 U.S. C. 3901b. 100 Stat. 3583, Emergency Wetlands Resources Act).
- The Back Bay NWR Station Management Plan (1993) expanded the role of the Refuge to include management emphases on other migratory bird groups, including threatened and endangered species, shorebirds, wading birds, marsh birds and songbirds/landbirds.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (Pub. L. 105–57; 111 Stat. 1252)

DESCRIPTION OF USE

(a) What is this use? Is it a priority public use?
The use is dog-walking. Dog-walking at Back Bay NWR consists of one or more visiting public accompanied by one or more dogs on a leash, casually walking along Refuge parking areas, beaches, nature trails and roadways. Dog-walking is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

Dog-walking should not be confused with the use of (dog) retrievers by waterfowl hunters in those areas of Back Bay NWR that will be opened for waterfowl hunting in the future. Although waterfowl hunting is not currently permitted on the Refuge, there are plans to introduce that priority public use.

(b) Where would the use be conducted?
Dog-walking has been permitted in recent years in the following three areas:

1. On all public trails located on the barrier spit of Back Bay NWR; from the entrance, extending south to the south end of D-Pool (head of east and west dike roads).

2. On the Refuge beach from the southern end of the closed section of beach ("North Mile"), south to an imaginary line extending from the south end of D-Pool eastwardly to the ocean.

3. At the Horn Point canoe/kayak launch facility on Horn Point Road.

Habitats involved include woodlands, emergent marshes, shrublands, open water and open fields. All of these areas are frequently used by migratory landbirds, shorebirds, waterfowl, wading birds and marshbirds, together with deer, raccoon, fox, bobcat and opossum. Under the new determination, dog-walking will no longer be permitted at any locations of Back Bay NWR, including the above three.

(d) When would the use be conducted?
Dog-walking has been permitted during the winter through early spring period, in the headquarters, adjacent nature trails and beach areas, where migratory bird use was low. The public and their leashed dogs have been in those areas from one-half hour before sunrise to one-half hour after sunset between October 1 and March 31. This use has been terminated so that dog-walking is no longer be permitted in any Refuge locations.

(e) How would the use be conducted?
Since dog-walking is no longer be permitted, Refuge regulations (including 50 CFR) will be revised to reflect this change from our current policy. Public signing will also reflect the change at the Refuge entrance. A Refuge brochure/flyer will be developed for visitor information and education, specifically informing them about this regulation change Refuge staff patrols by foot and vehicle will be conducted daily to advise visitors of the new regulation, monitor visitor activity, and as necessary, conduct enforcement.

(f) Why is this use being proposed?
This use is no longer being proposed. Rather, as a past use, dog walking is now eliminated Banks and Bryan (2007, p.611) "clearly demonstrate that dog walking in woodland leads to a 35% reduction in bird diversity and 41% reduction in (bird) abundance …. These results argue against access by dog walkers to sensitive conservation areas." Back Bay NWR is considered to be such a "sensitive conservation area." The researchers cited in this document provide strong evidence that the mere presence of dogs creates significant negative impacts to migratory bird and native wildlife species, particularly in areas such as Back Bay NWR, that support moderate to high concentrations of wildlife.

AVAILABILITY OF RESOURCES

Ceasing this use is within the resources available to administer our Visitor Services Program. Some material costs will be incurred by the Refuge, in terms of administrative changes to 50 CFR, new signage and changes to Refuge brochures that detail Refuge regulations and policies. Compliance with the dog prohibition is within the regular duties of the Station Law Enforcement Officer.

ANTICIPATED IMPACTS OF THE USE

The amount of available information (some included in this document) now supports the belief that the presence of dogs constitutes a significant negative impact to Refuge wildlife populations; particularly where significant wildlife concentrations exist, whether these populations be migratory birds or native mammals. Sime (1999) studied this issue closely and determined that there can be an increase in wildlife disturbances from dog walking due to normal dog behavior (i.e. jumping, barking, and running free off a leash). In the abstract portion of the paper Sime (1999) summarizes as follows: "At some level, domestic dogs still maintain instincts to hunt and/or chase …. Even if the chase instinct is not triggered, dog presence in and of itself has been shown to disrupt many wildlife species. Authors of many wildlife disturbance studies concluded that dogs with people, dogs on-leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals …. In addition, dogs can force movement by ungulates (avoidance or evasion during pursuit), which is in direct conflict with overwinter survival strategies which promote energy conservation." This unnecessary expenditure of needed overwintering calories by waterbirds on Back Bay NWR is also a major concern to Refuge biologists. Abraham (2006) also stresses that recurrent flushing of wildlife may result in decreased fertility, degraded health, increased stress, inefficient energy expenditure, and lowered capacity to survive and reproduce.

Sime (1999) continues by stating, "Dogs are noted predators of various wildlife species in all seasons. Domestic dogs can potentially introduce diseases (distemper, parvovirus, and rabies) and transport parasites into wildlife habitats. While dog impacts to wildlife likely occur at the individual scale, the results may still have important implications for wildlife populations. For most wildlife species, if a 'red flag' is raised by pedestrian-based recreational disturbance, there could also be problems associated with the presence of domestic dogs."

Jones and Stokes (1977) showed that dog depredation can have serious detrimental impacts on local concentrated nesting bird populations. Data collected on bird flushings by dogs indicate that dog-induced shorebird flushes do occur and may be detrimental to declining bird populations (Soluri. 1994; Gill. 1994).

Domestic dogs have demonstrated the ability to act as predators on deer and other wildlife species when presented with the opportunity (Lowry & McArthur. 1978; Progulske & Baskett. 1958). As a result, these wildlife species tend to regard dogs as predators; their normal behavioral patterns are disrupted by the perception (scent) and presence of even leashed dogs.

Dogs are also used throughout Virginia for the hunting of deer, fox, bear and raccoon; further emphasizing the perception of those wildlife species of dogs as threats and predators. Knowledge of such predator presence elicits negative behavioral responses from such native land mammals that disrupts their normal behavioral biology and affects their health and well-being (Massopust a. R. K. A. 1984; Roseberry. 1980). In some cases the presence of a dog can inhibit the ability of a fox to secure food (Mitchell & Banks. 2005), leading to malnutrition or worse.

A comparison of wildlife activity levels in areas that prohibit dogs versus areas that permitted dogs was conducted by Lenth, et al (2006). This Study determined that altered patterns of habitat utilization by several native wildlife species occurred along trails that dogs utilized. This effect extended from 50 meters (for bobcat, squirrels, rabbits, chipmunks and mice) to 100 meters (for

mule deer) off the trail. These altered habitat use patterns did not occur along trails that dogs were not permitted on. The projected result is that those habitats that dogs are permitted in do not receive the wildlife use that they should. Such denied use of habitats to the resident wildlife population results in additional stressors on the health and well-being of those wildlife species. Finally, dog waste has created sanitation issues and an unsightly environment for other Refuge visitors and staff along Refuge trails, lawns and fields.

Dog-walking should not be confused with the use of retrievers by waterfowl hunters in those areas of Back Bay NWR that will be opened for waterfowl hunting in the future. Retrievers are highly trained animals that stay close to the waterfowl hunter/hunting party, in an enclosed duck hunting blind. The hunting party and dog is usually surrounded by water and remain confined to the blind until given the command to retrieve a downed duck or goose. Such retriever use ensures a minimal "crippling loss" of migratory waterfowl. As such, it is an effective and efficient conservation tool used in a priority public use only during the specific waterfowl hunting season.

PUBLIC REVIEW AND COMMENT

As part of the CCP process for Back Bay NWR this compatibility determination was made available for a 30-day public review and comment period with the release of the Draft CCP/EA.

DETERMINATION

__X__ Use is not compatible

____ Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Dogs will no longer be permitted on Back Bay National Wildlife Refuge at any time of year, whether leashed or not. This compatibility determination does not extend to the use of (dog) retrievers by waterfowl hunters (as described above) engaged in legal waterfowl hunting in those areas of the Refuge that will be opened to waterfowl hunting in the future.

JUSTIFICATION

The Refuge has re-examined and evaluated our existing policy on dog walking to better meet the needs of our public while also minimizing wildlife disturbances. Since the Refuge mission consists of providing habitats for wintering and migrating birds that include waterfowl, shorebirds, wading birds, marshbirds and landbirds, minimizing those uses that provide the greatest potential conflicts and disturbances to those migratory bird species is a priority. Dogs have been shown by recent research to displace native migratory bird species from natural habitats (Banks & Bryan. 2007; Fernandez-Juricic and Telleria. 2000) that Back Bay NWR was established to provide.

Minimizing negative impacts to other wildlife species (deer, raccoon, fox, opossum, black bear,

bobcat and coyote) that share many of these same habitats is also a responsibility of Refuge staff. Research has revealed that dog presence results in definite predator-type defense reactions by these native wild mammals, including avoidance/vacating the area (Lima et al.1999; Mitchell & Banks. 2005; Lenth, et al. 2006.) Although there is some demand for dog-walking on the Refuge, permitting dog-walking to continue in the face of this new evidence is no longer compatible with the purposes for our establishment and/or our management goals and objectives. The prohibition of dog-walking on Back Bay NWR will minimize adverse impacts to Refuge wildlife that perceive dogs as predators, particularly the migratory waterbird, deer, raccoon, fox and bobcat components of the Refuge wildlife population.

Signature: Refuge Manager [signature] 9/1/2010
(Signature and Date)

Concurrence: Regional Chief [signature] 09/16/2010
(Signature and Date)

10 Year date: 09/16/2020

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Appendix B



USFWS

Scattered numbers of the Northern pintail migrate through and winter in Back Bay NWR

Wilderness Review

Introduction

The purpose of a wilderness review is to identify and recommend for Congressional designation National Wildlife Refuge System (NWRS) lands and waters that merit inclusion in the National Wilderness Preservation System (NWPS). Wilderness reviews are a required element of comprehensive conservation plans and conducted in accordance with the refuge planning process outlined in 602 FW 1 and 3, including public involvement and the National Environmental Policy Act compliance.

There are three phases to the wilderness review process: (1) inventory, (2) study, and (3) recommendation. Lands and waters that meet the minimum criteria for wilderness are identified in the inventory phase. These areas are called wilderness study areas (WSAs). In the study phase, a range of management alternatives are evaluated to determine if a WSA is suitable for wilderness designation or management under an alternate set of goals and objectives that do not involve wilderness designation.

The recommendation phase consists of forwarding or reporting the suitable recommendations from the Director through the Secretary and the President to Congress in a wilderness study report. The wilderness study report is prepared after the record of decision for the final CCP has been signed. Areas recommended for designation are managed to maintain wilderness character in accordance with management goals, objectives, and strategies outlined in this final CCP until Congress makes a decision or the CCP is amended to modify or remove the wilderness proposal. If the final determination in a CCP is that a WSA is not suitable, we document the decision in the CCP and end the study process. We will manage unsuitable areas following the management direction outlined in this CCP.

In 1974, 2,400 acres within the Back Bay National Wildlife Refuge (NWR) were identified as proposed wilderness (Map B-1). The proposed wilderness encompassed approximately 2,000 acres of marsh islands and a mainland marsh unit adjacent to the islands, and 165 acres of a mainland forested unit. In the process of this Wilderness Review we will evaluate all lands within the current Refuge boundary to determine if the proposed wilderness continues to meet the minimum criteria and if any other lands meet the same criteria.

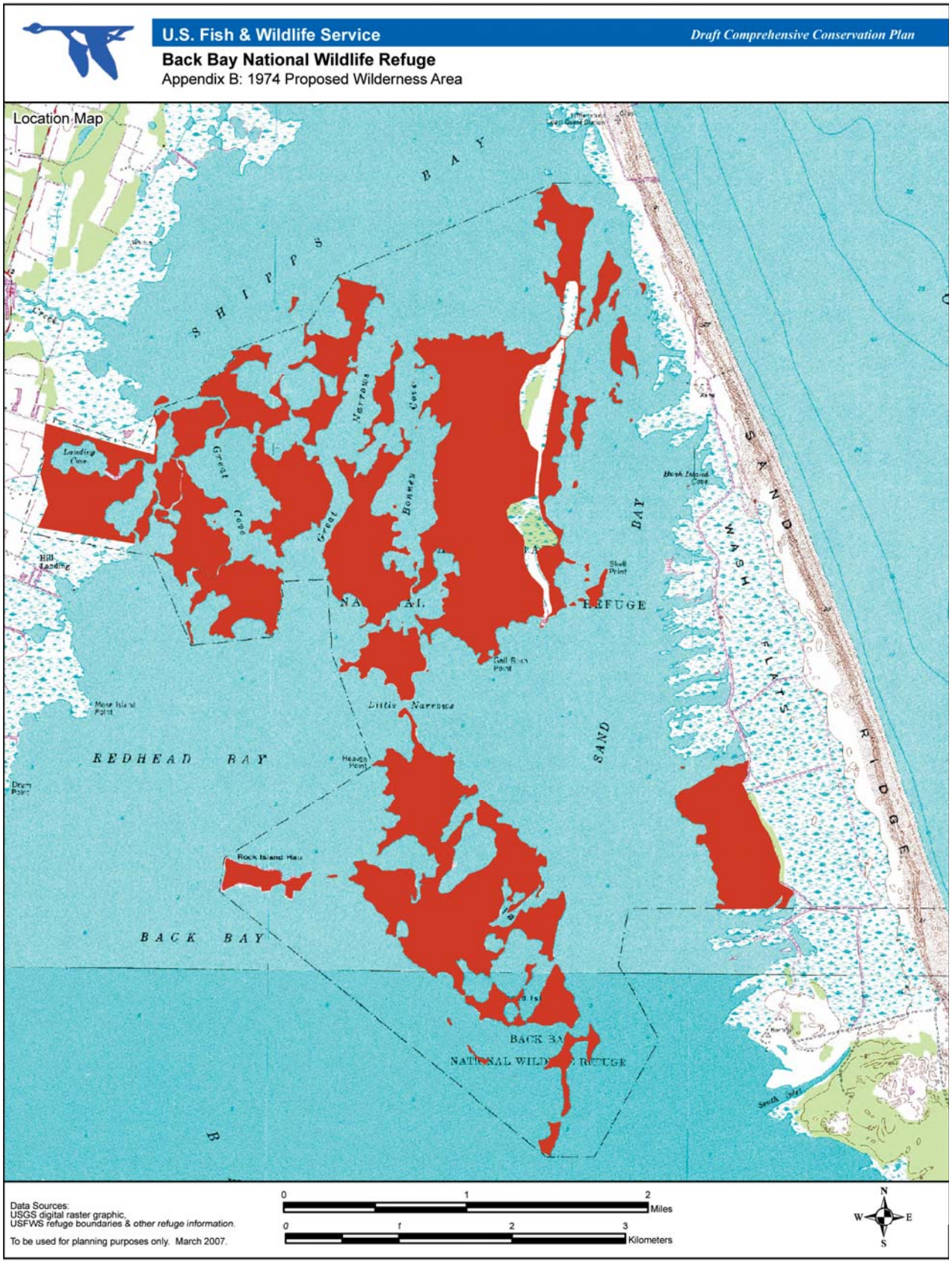
Back Bay NWR staff and Region 5, Regional Office personnel met at the Refuge from April 11 through April 29 to gather information and conduct an inventory of the Refuge's lands and waters. This process required combining selective site visits and site knowledge with existing land status maps, photographs, available land use information and road inventory data to determine if the Refuge lands and waters met the minimum criteria for wilderness. Aerial and non-aerial photographs were used to document the imprint of man's work, road locations, and other surface disturbances. The photographs used for this review are included at the end of this Appendix.

Wilderness Review Team

1) Carolina Ferro Vasconcelos – Assistant Planner, Eco intern, Hadley, RO
2) John Gallegos – Refuge Biologist, Back Bay NWR
3) Jared Brandwein – Refuge Manager, Back Bay NWR
4) Tom Bonetti – Lead Planner, Hadley, RO

Appendix B

Map B-1



Back Bay National Wildlife Refuge

Wilderness Inventory Phase I:

The wilderness inventory is a broad look at the planning area to identify WSAs. A WSA is an area of undeveloped Federal land that retains its primeval character and influence, without permanent improvements or human habitation and further meets the minimum criteria for wilderness as identified in Section 2(c) of the Wilderness Act. A WSA must be a roadless area or island, meet the size criteria, appear natural, and provide for solitude or primitive recreation.

Minimum Wilderness Criteria

A WSA is required to be roadless, meet the size criteria, appear natural, and provide for solitude or primitive recreation.

1. Roadless

Roadless refers to the absence of improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use. A route maintained solely by the passage of vehicles does not constitute a road. Only Federal lands and waters are eligible to be considered for Wilderness designation and inclusion into the NWPS.

2. Size

Roadless areas or roadless islands meet the size criteria if any one of the following standards applies.

- An area with over 5,000 contiguous acres. State and private lands are not included in making this acreage determination.
- A roadless island of any size. A roadless island is defined as an area surrounded by permanent waters or that is markedly distinguished from the surrounding lands by topographical or ecological features.
- An area of less than 5,000 contiguous Federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.
- An area of less than 5,000 contiguous acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another Federal wilderness managing agency such as the Forest Service, National Park Service, or Bureau of Land Management.

3. Naturalness

A WSA must meet the naturalness criteria. The Wilderness Act, Section 2(c), defines wilderness as an area that "... generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable." The area must appear natural to the average visitor rather than "pristine." The presence of historic landscape conditions is not required. An area may include some human impacts provided they are substantially unnoticeable in the unit as a whole. Significant human-caused hazards, such as the presence of unexploded ordnance from military activity, and the physical impacts of refuge management facilities and activities are also considered in evaluation of the naturalness criteria. An area may not be considered unnatural in appearance solely on the basis of the "sights and sounds" of human impacts and activities outside the boundary of the unit. The cumulative effects of these factors in conjunction with land base size, physiographic and vegetative characteristics were considered in the evaluation of naturalness.

4. Solitude or Primitive and Unconfined Recreation

In addition to meeting the roadless, size and naturalness criteria, a WSA must provide outstanding opportunities for solitude or primitive and unconfined recreation. The area does not have to possess outstanding opportunities for both solitude and primitive and unconfined recreation, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be open to public use and access to qualify under this criteria; Congress has designated a number of wilderness areas in the Refuge System that are closed to public access to protect resource values.

Opportunities for solitude refer to the ability of a visitor to be alone and secluded from other visitors in the area. Primitive and unconfined recreation means non-motorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk; self reliance; and adventure. These two "elements" are not well defined by the Wilderness Act, but, in most cases, can be expected to occur together. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential. Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

5. Supplemental Values

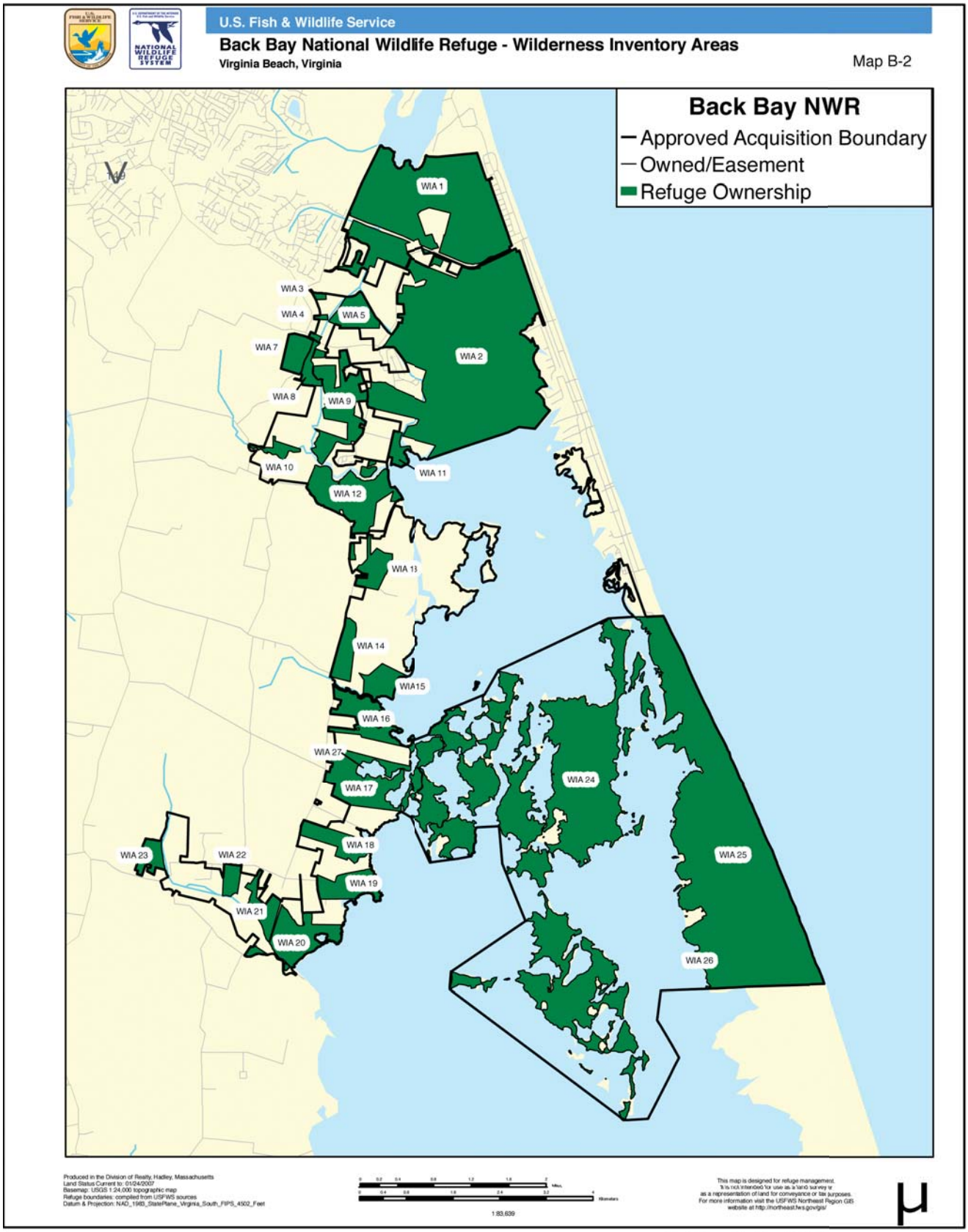
The Wilderness Act states that an area of wilderness may contain ecological, geological, or other features of scientific, educational, scenic or historical value. Supplemental values of the area are optional, but the degree to which their presence enhances the area's suitability for wilderness designation should be considered. The evaluation should be based on an assessment of the estimated abundance or importance of each of the features.

Wilderness Inventory methodology

The Back Bay NWR Wilderness Inventory was divided into two separate and distinct steps. In step one; we inventoried all Federal lands within the Back Bay NWR that were not proposed for Wilderness designation in 1974, including those lands that have been acquired. In step two; we inventoried the lands within Back Bay NWR that were proposed for Wilderness designation in 1974.

Wilderness Inventory Phase Step One: Inventory of all Federal lands within the Back Bay National Wildlife Refuge that were not proposed Wilderness in 1974

These fee title lands were initially assessed based on the size criteria. The Federal lands within the Back Bay National Wildlife Refuge that were not proposed Wilderness in 1974 were divided into twenty four separate blocks (Map B-2). The blocks, which we tentatively called Wilderness Inventory Areas (WIA), are bordered by major roads or bodies of water which are not owned in fee title. Several of the large WIAs contained improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use. Before we refined the boundaries of each WIA to eliminate the road systems, we calculated the acreage of each WIA. Further refinement would have increased the number, and reduced the size of each WIA. The largest block that was found during our initial review was 1,884.4 acres. Because the largest block was less than 5,000 acres, we determined that none of WIAs met the size criteria for a WSA (Table B.1). The Federal lands within the Back Bay National Wildlife Refuge that were not proposed Wilderness in 1974 will not be considered further for possible Wilderness designation in this CCP.



Back Bay National Wildlife Refuge

Wilderness Inventory Phase II: Inventory of all lands within the Back Bay National Wildlife Refuge that were proposed for Wilderness designation in 1974

The lands within the Back Bay NWR that were proposed for Wilderness designation in 1974 total of 2,400 acres, and consist of a large assemblage of roadless islands and two mainland units, Green Hills and Landing Cove. The proposed designation of these lands was based on allowing the continuation of controlled burning as a wildlife management practice to meet the objectives of the Refuge. Certain Refuge lands within the 1974 proposed wilderness area were not proposed for wilderness designation. They include: three goose pastures on Long Island that were maintained with the use of motorized equipment; and a bridge and motor trail on Long Island. The three goose pastures totaling approximately 59 acres are no longer maintained for goose browse by the Refuge. The pastures have reverted to shrub species such as: wax myrtle and salt bush, *panicum* grass species, broom sedge, holly, and sweet gum. The bridge and motor trail on Long Island no longer exist. The bridge remnants now consist of a few deteriorating pilings. For the purposes of this review, these areas were considered as part of the lands within the Back Bay NWR that were proposed for Wilderness designation in 1974.

WIA-24 Island Assemblage

The Refuge islands, totaling 2000 acres are located within the bay portion of the Refuge. Predominate island vegetation is black needle rush, cattail and invasive phragmites. There are two large island units known as Long Island and Ragged Island.

Long Island is the largest and least eroded of the island complex while Ragged Island is somewhat smaller and shows a high rate of erosion. Long Island is approximately 800 acres. This includes 55 acres of old fields that are slowly reverting back to woodland, 50 acres of (red maple) hardwood forest, while the remaining acreage consists of emergent black needlerush marshes, ponds, small guts and inlets. Ragged Island is approximately 700 acres of emergent needlerush marshes, scattered waxmyrtle and open water or "potholes." Long Island supports scattered hawthorns, and a mix of loblolly pine, waxmyrtle, hackberry, sweetgum, black cherry, persimmon, red cedar, groundsel/saltbush and a variety of oaks such as black and pin oaks. Several wetland sites on Long Island support unique Olney's three-square marshes and a floating spikerush marsh. They are the only known locations for these two unique marsh communities on Back Bay NWR, and thus, require protection. Surveys have revealed that Long Island is also unique in supporting one of the few breeding populations of seaside sparrows in this area.

The Refuge has been actively controlling Phragmites on Long Island and Ragged Island since 1987 through the use of "Rodeo" (glyphosate), an approved pesticide. Dense dead stands have been removed by controlled burns to promote the growth of native and more desirable species. Back Bay NWR biologists suspect that Long Island is one of the few areas where native phragmites can be found. Long Island also possesses an important cultural resource. An old cemetery site can be found within the woods edge adjacent to an old field, on northern Long Island, south of the "Boy Scout Bridge" canal.

Adjacent to both islands are numerous islets. These smaller land units have eroded and are no longer connected. The remaining islands are small units that are either isolated or are a complex of islands interspersed by coves. All of the islands within this area are roadless, meet the size criteria, and can provide some limited opportunities for primitive recreation.

Conditions outside the area of the Refuge islands have changed considerably since 1974. The population of Virginia Beach has increased more than 250% since 1970, from 172,000 to the current estimate of 440,000. The proliferation of boats and personal motorized watercraft (i.e. jet skis) on waters surrounding the islands has resulted in additional impacts related to "sights and sounds" than originally

Table B.1. Wilderness Inventory Areas

WIA #	Name	Size (acres)
1	Black Gut	824.29
2	North Bay Marshes	1884.4
3		5.89
4		4.43
5		83.14
6		4.76
7		60.53
8		31.08
9	Carter impoundment	217.66
10		26.11
11		33.39
12		249.02
13		76.66
14		70.96
15		69.18
16		137.21
17	Farm land (minus landing cove)	225.17
18		92.81
19		102.13
20		157.98
21		78.42
22		35.71
23		51.22
24*	Island Assemblage	2000
25	Beach and impoundment area (minus green hills)	1929.4
26*	Green Hills	165
27*	Mainland marsh unit (Landing Cove area)	136

**1974 Proposed Wilderness Areas*

evaluated thirty years ago. Non-native invasive plants such as phragmites are also much more dominant than before, and can require intensive management to maintain biological integrity and environmental health. In addition, due to island erosion and the intensive management efforts needed to control encroachment of invasive species, the Island Assemblage is affected by man's work rather than the forces of nature, and this work can be noticeable throughout the year.

Although the islands can provide some limited opportunities for primitive recreation, and even solitude in the winter months, there are no outstanding opportunities for solitude and/or primitive or unconfined recreation throughout the year. The islands no longer meet minimum criteria for solitude or primitive recreation.

WIA-26 Green Hills—mainland unit

Green Hills is a roadless forested block of approximately 165 acres that was added to the wilderness proposal of 1974 as a result of the public hearing during that time. These woodlands are generally low, reaching heights of 20 feet or less, due to the "salt pruning" of salt-laden winds from the ocean. Dominant species include live oak, loblolly pine, red cedar, laurel oak, red maple and sweetgum. A few pond pines can also be found in this area. To encourage nesting of the prothonotary warbler, nestboxes were placed on red maples within this area. It provides limited opportunities for primitive recreation, primarily deer and hog hunting. Located on the east side of the bay, it is bordered by the bay on the west and south and on the north by small eroded areas of basic marsh vegetation (marsh fingers). On the east a staff access road borders and separates this block of forest from the impoundment complex.

Green Hills does not currently meet the minimum criteria for size, as it is not an island and is drastically less than 5,000 acres. Its location and small size of 165 acres would make future preservation and use in an unimpaired condition mostly impractical, and therefore unsuitable for wilderness management.

WIA-27 Landing Cove—mainland unit

This roadless unit of approximately 136 acres is located on the west side of the bay, and adjacent to the islands on its east side. It has the same basic marsh vegetation as the islands, composed of cattails, black needle rush (predominant), and phragmites. On the west it is adjacent to the mainland, a new acquired farm fields. A strip of trees (pine) mixed with some shrubs (wax myrtle) separates the marsh area from the farm field. It could provide limited opportunities for primitive recreational activities. As with the Green Hills unit, the Landing Cove unit does not currently meet the minimum criteria for size. Landing Cove is not of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.

Wilderness Inventory Conclusion

The Service finds all Federal lands within the Back Bay NWR that were not proposed Wilderness in 1974 do not meet the minimum size criteria as defined by the Wilderness Act, and will not be considered further in this CCP for Wilderness designation.

The Service also finds that the lands within the Back Bay NWR that were proposed for Wilderness designation in 1974 do not meet the minimum criteria for size (mainland units), or for outstanding opportunities for solitude or primitive and unconfined recreation and naturalness (Island assemblage) as defined by the Wilderness Act. The lands proposed for wilderness designation in 1974 will not be considered further in the CCP for wilderness designation.

Land classification can be thought of as a continuous spectrum of land types ranging from urbanized land, on one end, to wilderness, on the other. In our society, all portions of the spectrum are important, and many land classifications

for public lands can compliment wilderness. Many of these classifications better fit the recreation desires of diverse users and are excellent alternatives to visiting wilderness. One such classification is a "Research Natural Area."

Research Natural Areas exist throughout the country on public lands. Unlike wilderness areas, recreation is not a primary use in these areas, but they supplement the educational and scientific values of wilderness areas. These areas are intended to serve as gene pools for rare and endangered species and as examples of significant natural ecosystems. Like wilderness areas, they also serve as important outdoor laboratories to study natural systems. The lands at Back Bay originally proposed for wilderness in 1974 would seem to be better suited as a designated Research Natural Area than as a proposed wilderness.

Definition of Wilderness:

"(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Appendix C



USFWS

Laughing gulls spend their summers and falls on Refuge beaches

Species and Habitats of Conservation Concern Known or Suspected on the Refuge

Species List—Birds Species and Relative Abundance

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Loons					
Red -throated Loon	*Gavia stellata*	U		U	U
Common Loon	*Gavia immer*	U	O	C	U
Grebes					
*Pied-billed Grebe	*Podilymbus podiceps*	C	U	C	C
Horned Grebe	*Podiceps auritus*	U		U	U
Red-necked Grebe	*Podiceps grisegena*	O		O	R
Fulmars, Petrels and Shearwaters					
Cory's Shearwater	*Colonectris diomedea*		R	R	
Greater Shearwater	*Puffinus gravis*		O	O	
Sooty Shearwater	*Puffinus carneipes*		O	O	
Storm-Petrels					
Wilson's Storm-Petrel	*Oceanites oceanicus*		O		
Boobies and Gannets					
Northern Gannet	*Sula bassanus*	C		C	C
Pelicans					
American White Pelican	*Pelecanus erythrorhynchos*	R		R	R
Brown Pelican	*Pelecanus occidentalis*	C	C	C	O
Cormorants					
Double-crested Cormorant	*Phalacrocorax auritus*	A	U	A	U
Great Cormorant	*Phalacrocorax carbo*	R		R	R
Bitterns, Herons and Egrets					
*American Bittern	*Botaurus lentiginosus*	U	U	U	U
*Least Bittern	*Ixobrychus exilis*	U	U	O	
*Great Blue Heron	*Ardea herodias*	C	C	C	C
Great Egret	*Casmerodius albus*	C	C	C	U
Snowy Egret	*Egretta thula*	C	C	C	U
Little Blue Heron	*Egretta caerulea*	U	C	C	U
Tricolored Heron	*Egretta tricolor*	U	U	U	R
*Cattle Egret	*Bubulcus ibis*	O	U	O	R
*Green Heron	*Butorides virescens*	U	U	U	O
*Black-crowned Night-Heron	*Nycticorax nycticorax*	U	U	U	O
*Yellow-crowned Night-Heron	*Nycticorax violaceus*	O	O	O	R
Ibises and Spoonbills					
White Ibis	*Eudocimus albus*	O	O	O	R
Glossy Ibis	*Plegadis falcinellus*	U	C	C	R

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
New World Vultures					
Black Vulture	*Coragypus atratus*	O	O	O	O
Turkey Vulture	*Cathartes aura*	C	C	C	O
Swans, Geese and Ducks					
Fulvous Whistling-Duck	*Dendrocygna bicolor*			R	R
Snow Goose	*Chen caerulescens*	U		C	A
*Canada Goose	*Branta canadensis*	C	U	U	C
Brant	*Branta bernicla*				R
Tundra Swan	*Cygnus columbianus*	U	R	U	C
*Gadwall	*Anas strepera*	C	O	C	C
Eurasian Wigeon	*Anas penelope*	R		R	R
American Wigeon	*Anas americana*	U		U	C
*American Black Duck	*Anas rubripes*	C	U	C	C
*Mallard	*Anas platyrhynchos*	C	U	C	C
*Blue-winged Teal	*Anas discors*	C	U	C	O
Northern Shoveler	*Anas clypeata*	U		U	U
Northern Pintail	*Anas acuta*	O	U	C	C
Green-winged Teal	*Anas crecca*	U		C	C
Canvasback	*Aythya valisineria*	R		R	R
Redhead	*Aythya americana*	R		R	R
Ring-necked Duck	*Aythya collaris*	O		O	U
Greater Scaup	*Aythya marila*	O		O	O
Lesser Scaup	*Aythya affinis*	U		U	U
King Eider	*Somateria spectabilis*			R	
Common Eider	*Comateria mollissima*			O	
Surf Scoter	*Melanitta perspicillata*	U		C	U
White-winged Scoter	*Melanitta fusca*	O		U	U
Black Scoter	*Melanitta nigra*	U		C	U
Long-tailed Duck	*Clangula hyemalis*	O		O	O
Bufflehead	*Bucephala albbeola*	O		U	U
Common Goldeneye	*Bucephala clangula*	O		O	O
Hooded Merganser	*Lophodytes cucullatus*	O	R	O	O
Common Merganser	*Mergus merganser*	R		R	R
Red-breasted Merganser	*Mergus serrator*	C	R	U	A
Ruddy Duck	*Oxyura jamaicensis*	U		U	U
Osprey, Kites, Hawks and Eagles					
*Osprey	*Pandion haliaetus*	C	C	C	R
Swallow-tailed Kite	*Elanoides forficatus*	O			

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Osprey, Kites, Hawks and Eagles (cont.)					
*Bald Eagle	*Haliaeetus leucocephalus*	U	U	O	U
Northern Harrier	*Circus cyaneus*	C	U	C	C
Sharp-shinned Hawk	*Accipiter striatus*	C	R	C	U
Copper's Hawk	*Accipiter cooperii*	O		U	U
Northern Goshawk	*Accipiter cgentilis*			R	
*Red-shouldered Hawk	*Buteo lineatus*	U	U	U	U
Broad-winged Hawk	*Buter platypterus*	O		O	
Red-tailed Hawk	*Buteo jamaicensis*	U	U	U	U
Rough-legged Hawk	*Buteo lagopus*			R	R
Falcons and Caracaras					
*American Kestrel	*Falco sparverius*	C	U	C	U
Merlin	*Falco columbarius*	U		C	O
Peregrine Falcon	*Falco mexicanus*	U	O	U	O
Gallinaceous Birds					
*Northern Bobwhite	*Colinus virginianus*	C	C	C	U
Rails					
Yellow Rail	*Coturnicops noveboracensis*	R	R	R	R
Black Rail	*Latterallus jamaicensis*	U	U	U	
*Clapper Rail	*Rallus longirostris*	U	U	U	O
*King Rail	*Rallus elegans*	U	U	U	U
*Virginia Rail	*Rallus limicola*	C	U	C	U
Sora	*Porzana carolina*	U	R	U	U
Rails Continued					
Purple Gallinule	*Porphyrula martinica*	R	R	R	
*Common Moorhen	*Gallinula chloropus*	O	O	O	O
American Coot	*Fulica americana*	U	R	U	U
Cranes					
Sandhill Crane	*Grus canadensis*	R		O	
Plovers					
Black-bellied Plover	*Pluvialis squatarola*	C	C	C	O
American Golden-Plover	*Pluvialis dominica*	O		O	
Wilson's Plover	*Charadrius wilsonia*	R	R	R	
Semipalmated Plover	*Charadrius semipalmatus*	C	U	C	U
Piping Plover	*Charadrius alexandrinus*	O	R	O	
*Killdeer	*Charadrius vociferus*	U	U	U	O

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Oystercatchers					
American Oystercatcher	*Haematopus palliatus*	R		R	
Stilts and Avocets					
Black-necked Stilt	*Himantopus mexicanus*	O	O	R	
American Avocet	*Recurvirostra americana*	O	R	O	
Sandpipers and Phalaropes					
Greater Yellowlegs	*Tringa melanoleuca*	A	C	C	U
Lesser Yellowlegs	*Tringa flavipes*	A	C	C	U
Solitary Sandpiper	*Tringa solitaria*	O	O	O	
Willet	*Catoptrophorus semipalmatus*	U	R	U	R
Spotted Sandpiper	*Actitis macularia*	U	O	U	R
Upland Sandpiper	*Bartramia longicauda*	O	O	O	
Whimbrel	*Numerius phaeopus*	U	O	U	R
Hudsonian Godwit	*Limosa haemastica*	R		R	
Marbled Godwit	*Limosa fedoa*	O	R	R	
Ruddy Turnstone	*Arenaria interpres*	C	O	C	R
Red Knot	*Calidris canutus*	U	O	U	R
Sanderling	*Calidris alba*	A	C	A	C
Semipalmated Sandpiper	*Calidris pusilla*	C	O	C	R
Western Sandpiper	*Calidris mauri*	U	U	C	O
Least Sandpiper	*Calidris minutilla*	C	R	C	O
White-rumped Sandpiper	*Calidris fuscicollis*	U	R	U	
Baird's Sandpiper	*Calidris bairdii*			R	
Pectoral Sandpiper	*Calidris melanotus*	U		U	R
Dunlin	*Calidris alpina*	U	U	C	U
Stilt Sandpiper	*Calidris himantopus*	R	O	O	
Buff-breasted Sandpiper	*Tryncites subruficollis*	R		R	
Ruff	*Philomachus pugnax*	R		R	
Short-billed Dowitcher	*Limnodromus griseus*	C	U	C	
Long-billed Dowitcher	*Limnodromus scolopaceus*	O	O	O	
Wilson's Snipe	*Gallinago delicata*	C	U	C	U
American Woodcock	*Scolopax minor*	U	O	U	U
Wilson's Phalarope	*Phalaropus tricolor*	R	R	R	
Red-necked Phalarope	*Phalaropus lobatus*	R	R	R	
Skuas, Jaegers, Gulls and Terns					
Pomarine Jaeger	*Stercorarius pomarinus*	R	R	R	
Parasitic Jaeger	*Stercorarius parasiticus*	R		R	R

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Skuas, Jaegers, Gulls and Terns (cont.)					
Laughing Gull	*Larus atricilla*	U	C	C	O
Little Gull	*Larus minutus*	R		R	
Black-headed Gull	*Larus ridibundus*		R	R	R
Bonaparte's Gull	*Larus philadelphia*	U		O	U
Ring-billed Gull	*Larus delawarensis*	A	A	A	A
Herring Gull	*Larus argentatus*	C	U	C	U
Iceland Gull	*Larus glaucoides*	R		R	R
Lesser Black-backed Gull	*Larus fuscus*	C	C	C	U
Glaucous Gull	*Larus hyperboreus*	R		R	R
Great Black-backed Gull	*Larus marinus*	C	O	C	C
Black-legged Kittiwake	*Rissa tridactyla*	R		R	R
Gull-billed Tern	*Sterna nilotica*	O	O	O	
Caspian Tern	*Sterna caspia*	U	O	U	
Royal Tern	*Sterna maxima*	C	C	C	R
Sandwich Tern	*Sterna sandvicensis*	U	U	U	
Roseate Tern	*Sterna dougallii*	R	R		
Common Tern	*Sterna hirundo*	U	C	C	O
Forster's Tern	*Sterna forsteri*	C	U	C	O
Least Tern	*Sterna antillarum*	U	U	U	
Black Tern	*Childonias niger*	O	O	O	
Black Skimmer	*Rynchops niger*	O	O	O	
Auks and Puffins					
Razorbill	*Alca torda*				R
Pigeons and Doves					
*Rock Dove	*Columba livia*	O	O	O	O
*Mourning Dove	*Zenaida macroura*	C	C	C	U
Cuckoos and Anis					
Black-billed Cuckoo	*Coccyzus erthropthalmus*	R	R	R	
*Yellow-billed Cuckoo	*coccyzus americanus*	U	U	U	
Owls					
*Barn Owl	*Tyto alba*	O	O	O	O
*Eastern Screech-Owl	*Otus asio*	U	U	U	U
*Great Horned Owl	*Bubo virginianus*	U	U	U	U
*Barred Owl	*Strix varia*	O	O	O	O
Short-eared Owl	*Asio flammeus*	R		R	R
Northern Saw-whet Owl	*Aegolius acadicus*			R	O

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Nightjars					
Common Nighthawk	*Chordeiles minor*	U	U		
*Chuck-will's-widow	*Caprimulgus carolinensis*	C	C	U	
Swifts					
*Chimney Swift	*Chaetura pelagica*	C	U	U	
Hummingbirds					
*Ruby-throated Hummingbird	*Archilochus colubris*	C	U	O	
Kingfishers					
*Belted Kingfisher	*Ceryle alcyon*	C	C	C	U
Woodpeckers					
*Red-headed Woodpecker	*Melanerpes erythrocephalus*	U	U	U	U
*Red-bellied Woodpecker	*Melanerpes carolinus*	U	U	U	U
Yellow-bellied Sapsucker	*Sphyrapicus varius*	O		O	O
*Downy Woodpecker	*Picoides pubescens*	U	U	U	U
*Hairy Woodpecker	*Picoides villosus*	O	O	O	O
*Northern Flicker	*Colaptes auratus*	C	U	C	U
*Pileated Woodpecker	*Dryocopus pileatus*	U	U	U	U
Flycatchers					
*Eastern Wood-Pewee	*Contoopus virens*	U	U	U	
Yellow-bellied Flycatcher	*Empidonax flaviventris*	R		R	
Acadian Flycatcher	*Empidonax virescens*	O		O	
Alder Flycatcher	*Empidonax alnorum*	O		O	
Willow Flycatcher	*Empidonax traillii*	O		O	
Least Flycatcher	*Empidonax minimus*			U	
*Eastern Phoebe	*Saorynis phoebe*	U	U	U	U
*Great Crested Flycatcher	*Myiarchus crinitus*	U	U	U	
Western Kingbird	*Tyrannus verticalis*			R	
*Eastern Kingbird	*Tyrannus tyrannus*	C	U	C	
Scissor-tailed Flycatcher	*Tyrannus forficatus*	R	R		
Shrikes					
Loggerhead Shrike	*Lanus ludovicianus*	R		R	R
Vireos					
*White-eyed Vireo	*Vireo griseus*	C	C	U	
Yellow-throated Vireo	*Vireo flavifrons*	U	U	O	
Blue-headed Vireo	*Vireo solitarius*	C		C	R
Warbling Vireo	*Vireo gilvus*	R			R
Philadelphia Vireo	*Vireo philadelphicus*			U	
*Red-eyed Vireo	*Vireo olivaceus*	C	C	C	

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Crows, Jays and Magpies					
*Blue Jay	*Cyanocitta cristata*	U	U	U	U
*American Crow	*Corvus brachyrhynchos*	C	C	C	C
*Fish Crow	*Corvus ossifraus*	C	C	C	C
Larks					
Horned Lark		R	R	R	R
Swallows					
*Purple Martin	*Progne subis*	C	C	C	
*Tree Swallow	*Tachycineta bicolor*	C	C	A	U
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	U	U	U	
Bank Swallow	*Riparia riparia*	U	U	U	
Cliff Swallow	*Hirundo pyrrhonota*	O	O	O	
*Barn Swallow	*Hirundo rustica*	C	U	C	
Titmice and Chickadees					
*Carolina Chickadee	*Parus carolinensis*	C	C	C	C
*Tufted Titmouse	*Parus bicolor*	U	U	U	U
Nuthatches					
Red-breasted Nuthatch	*Sitta canadensis*	R		O	R
*White-breasted Nuthatch	*Sitta carolinensis*	U	U	U	U
*Brown-headed Nuthatch	*Sitta pusilla*	U	U	U	U
Creepers					
Brown Creeper	*Certhia americana*	U		U	U
Wrens					
*Carolina Wren	*Thryothorus lodovicianus*	C	C	C	C
*House Wren	*Troglodytes aedon*	C	O	C	U
Winter Wren	*Troglodytes troglodytes*			U	U
Sedge Wren	*Cistothorus platensis*	U	O	U	U
*Marsh Wren	*Cistothorus palustris*	C	C	C	U
Kinglets					
Golden-crowned Kinglet	*Regulus satrapa*	C		U	U
Ruby-crowned Kinglet	*Regulus calendula*	C		C	U
Old World Warblers					
*Blue-gray Gnatcatcher	*Poliptila caerulea*	C	U	O	
Thrushes					
*Eastern Bluebird	*Sialia sialis*	C	C	U	U
Veery	*Hylocichla mustelina*	U		U	
Gray-cheeked Thrush	*Catharus ustulatus*	U		U	
Bicknell's Thrush	*Catharus bicknelli*	O		U	

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Thrushes (cont.)					
Swainson's Thrush	*Catharus ustulatus*	O		U	
Hermit Thrush	*Catharus guttatus*	U		U	U
*Wood Thrush	*Hylocichla mustelina*	U	U	U	
*American Robin	*Turdus migratorius*	A	C	A	U
Mimic Thrushes					
*Gray Catbird	*Dumetella carolinesis*	C	C	C	O
*Northern Mockingbird	*Mimus polyglottos*	C	C	C	U
*Brown Thrasher	*Toxostoma rufum*	C	C	C	U
Starlings					
*European Starling	*Sturnus vulgaris*	C	C	C	U
Pipits					
American Pipit	*Anthus rubescens*	O		O	O
Waxwings					
Cedar Waxwing	*Bombycilla cedorum*	U		U	U
Wood Warblers					
Tennessee Warbler	*Vermivora peregrina*	O		O	
Orange-crowned Warbler	*Vermiavora celata*	U		U	U
Nashville Warbler	*Vermivora ruficapilla*	O		O	
*Northern Parula	*Parula americana*	U	U	U	
*Yellow Warbler	*Dendroica petechia*	C	C	C	
Chestnut-sided Warbler	*Dendroica pensylvanica*	O		O	
Magnolia Warbler	*Dendroica magnolia*	U		U	
Cape May Warbler	*Dendroica tigrina*	O	C	R	
Black-throated Blue Warbler	*Dendroica caerulescens*	U		U	
*Yellow-rumped Warbler	*Dendroica coronata*	A		A	C
Black-throated Green Warbler	*Dendroica virens*	O		O	
Blackburnian Warbler	*Dendroica cerulea*	O		O	
*Yellow-throated Warbler	*Dendroica dominica*	O	O	O	
*Pine Warbler	*Dendroica striata*	C	U	U	O
*Prairie Warbler	*Dendroica discolor*	C	C	C	R
Palm Warbler	*Dendroica palmarum*	C	C	C	O
Bay-breasted Warbler	*Dendroica castanea*	R		U	
Blackpoll Warbler	*Dendroica striata*	C		C	
*Black-and-white Warbler	*Mmiotilta varia*	U	U	U	R
*American Redstart	*Setophaga ruticilla*	U	O	C	
*Prothonotary Warbler	*Protonotaria citrea*	C	U	C	
Worm-eating Warbler	*Helmintheros vermivorus*	U	U	O	

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Wood Warblers (cont.)					
*Ovenbird	*Seiurus aurocapillus*	C	O	U	
Northern Waterthrush	*Seiurus noveborachensis*	C		C	
*Louisiana Waterthrush	*Seiurus motacilla*	O	U	O	
Kentucky Warbler	*Oporornis formosus*	O	O	O	
Connecticut Warbler	*Oporornis agilis*			R	
Mourning Warbler	*Oporornis philadelphia*	R		R	
*Common Yellowthroat	*Geothlypis trichas*	A	C	C	U
*Hooded Warbler	*Wilsonia citrina*	U	U	U	
Wilson's Warbler	*Wilsonia pusilla*	R		O	
Canada Warbler	*Wilsonia canadensis*	O		O	
*Yellow-breasted Chat	*Icteria virens*	U	U	U	U
Tanagers					
*Summer Tanager	*Piranga rubra*	U	U	U	
Scarlet Tanager	*Piranga olivacea*	U		U	
Sparrows and Towhees					
*Eastern Towhee	*Pipilo erythrophthalmus*	A	C	C	U
American Tree Sparrow	*Spizella arborea*			R	R
*Chipping Sparrow	*Spizella passerina*	C	C	U	O
Clay-colored Sparrow	*Spizella pallida*			O	
*Field Sparrow	*Spizella pusilla*	U	U	C	U
Vesper Sparrow	*Pooecetes gramineus*	O		O	U
Lark Sparrow	*Chondestes grammacus*	R		R	R
*Savannah Sparrow	*Passerculus sandwichensis*	C	O	C	C
Grasshopper Sparrow	*Ammodramus savannarum*	O	U	O	U
Henslow's Sparrow	*Ammodramus henslowii*	R	R	R	
Le Conte's Sparrow	*Ammodramus leconteii*			O	O
Saltmarsh Sharp-tailed Sparrow	*Ammodramus caudacutus*	U		U	U
Seaside Sparrow	*Ammodramus maritimus*	U		U	O
Fox Sparrow	*Passerella iliaca*	O		O	O
*Song Sparrow	*Melospiza melodia*	C	C	C	C
Lincoln's Sparrow	*Melospiza lincolnii*				O
Swamp Sparrow	*Melospiza georgiana*	C	U	C	U
White-throated Sparrow	*Zonotrichia querula*	C	U	C	C
White-crowned Sparrow	*Zonotrichia leucophrys*	O		O	R
Dark-eyed Junco	*Junco hyemalis*	C		C	C
Lapland Longspur	*Calcarius lapponicus*			R	R
Snow Bunting	*Plectrophenax nivalis*			O	U

Common Name	Scientific Name	Seasonal Occurrence			
		Sp	Su	F	W
Cardinals, Grosbeaks and Allies					
*Northern Cardinal	*Cardinalis cardinalis*	C	C	C	C
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	U		O	
*Blue Grosbeak	*Passerina caerulea*	U	U	U	
*Indigo Bunting	*Passerina cyanea*	U	U	C	
Painted Bunting	*Passerina ciris*	R			
Dickcissel	*Spiza americana*			O	R
Blackbirds and Orioles					
Bobolink	*Dolichonyx oryzivorus*	C		C	
*Red-winged Blackbird	*Agelaius phoeniceus*	A	A	A	O
*Eastern Meadowlark	*Sturnella magna*	C	C	C	U
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*		R	R	R
Rusty Blackbird	*Euphagus carolinus*	O		R	O
Brewer's Blackbird	*Euphagus cyanocephalus*				O
*Common Grackle	*Quiscalus quiscula*	C	U	C	U
*Boat-tailed Grackle	*Quiscalus major*	A	A	A	U
*Brown-headed Cowbird	*Molothrus ater*	C	U	C	U
*Orchard Oriole	*Icterus spurius*	U	U	U	
Baltimore Oriole	*Icterus galbula*	C		C	R
Finches					
Purple Finch	*Carpodacus purpureus*	O		O	O
*House Finch	*Carpodacus mexicanus*	C	U	C	O
Pine Siskin	*Carduelis pinus*	O		O	O
*American Goldfinch	*Carduelis tristis*	U	O	U	U
Evening Grosbeak	*Coccothraustes vespertinus*	R		R	R
Old World Sparrows					
*House Sparrow	*Passer domesticus*	U	U	U	U

KEY

Seasonal Occurrence
Sp = Spring (March–May)
Su = Summer (June–August)
F = Fall (September–November)
W = Winter (December–February)

Relative Abundance
A = Abundant (very numerous)
C = Common (likely to be seen or heard)
U = Uncommon (present, not certain to be seen)
O = Occasional (seen a few times)
R = Rare (present periodically)
* = Birds known to nest on or near the Refuge

Mammal Species List

COMMON NAME	SCIENTIFIC NAME
Cottontail, Eastern	*Sylvilagus floridanus*
Deer, White-tailed	*Odocoileus virginianus*
Fox, Grey	*Urocyon cinereogrenteus*
Hog, Feral (Exotic)	*Sus scrofa*
Horse, Feral (Exotic)	*Equus caballus*
Mink	*Mustela vison*
Mole, Eastern	*Scalopus aquaticus*
Mouse, Cotton	*Peromyscusgossypinus*
Mouse, Eastern Harvest	*Reithrodontomys humilis*
Mouse, House	*Mus musculus*
Mouse, White-footed	*Peromyscus leocopus*
Muskrat	*Ondatra zibethicus*
Nutria (Exotic)	*Myocastor coypus*
Opossum	*Didelphis marsupialis*
Otter, River	*Lutra canadensis*
Rabbit, Marsh	*Sylvilagus palustris*
Raccoon	*Procyon lotor*
Rat, Marsh Rice	*Oryzomys palustris*
Rat, Norway (Exotic)	*Rattus norvegicus*
Shrew, Least	*Cryptotis parva*
Shrew, Shorttail	*Blarina brevicauda*
Shrew, Southeastern	*Sorex longirostris*
Squirrel, Eastern Grey	*Sciurus carolinensis*
Vole, Meadow	*Microtus pennsylvanicus*
Bat, Eastern Big-eared	*Corynorhinus rafinesquii*
Myotis, Little Brown	*Myotis lucifugus*
Myotis, Keen's	*Myotis keeni*
Bat, Silver-haired	*Lasionycteris noctivagans*
Pipistrel, Eastern	*Pipistrellus subflavus*
Bat, Big Brown	*eptesicus fuscus*
Bat, Red	*Lasiurus barealis*
Bat, Hoary	*Lasiurus cinereus*

Amphibian and Reptile Species List

COMMON NAME	SCIENTIFIC NAME
TURTLES	
Green Sea Turtle	*Cheloniamydas mydas*
Loggerhead, Atlantic	*Caretta caretta caretta*
Redley, Atlantic	*Lepidochelys kempii (Ridley)*
Mudturtle, Eastern	*Kinosternon subrubrum subrubrum*
Stinkpot	*Sternotherus odoratus*
Terrapin, Northern diamond back	*Malaclemys terrapin terrapin*
Turtle, Eastern box	*Terrapene carolina carolina*
Turtle, Eastern Painted	*Chrysemys picta picta*
Turtle, Red-bellied	*Chrysemys rubiventris*
Turtle, Snapping	*Chelydra serpentina*
Turtle, Spotted	*Clemmys guttata*
Turtle, Yellow-bellied	*Chrysemys scripta scripta*
SNAKES	
Copperhead, Southern	*Agkistrodon contortrix*
Cottonmouth, Eastern	*Agkistrodon piscivorus*
Racer, Northern Black	*Coluber constrictor constrictor*
Snake, Black Rat	*Elaphe obsoleta obsoleta*
Snake, Brown Water	*Natrix taxispilota*
Snake, Coastal Plain Milk	*Lampropeltis triangulum*
Snake, Corn	*Elaphe guttata guttata*
Snake, Eastern Garter	*Thamnophis sirtalis sirtalis*
Snake, Eastern hognose	*Heterodon platyrhinos*
Snake, Eastern King	*Lampropeltis getulus getulus*
Snake, Eastern Mud	*Farancia abacura abacura*
Snake, Eastern Ribbon	*Thamnophis sauritus sauritus*
Snake, Eastern Smooth earth	*Virginia valeriae*
Snake, Eastern Woods	*Carphophis amoenus amoenus*
Snake, Northern Brown	*Storeria dekayi dekayi*
Snake, Northern Scarlet	*Cemophora coccinea copei*
Snake, Northern Water	*Natrix sipedon sipedon*
Snake, Pine Woods	*Rhadinae flavilata*
Snake, Rainbow	*Farancia erythrogram*
Snake, Red-Bellied	*Storeria occipitomaculata*
Snake, Red-Bellied Water	*Natrix erythrogaster erythrogaster*
Snake, Southern Ringneck	*Diadophis punctatus punctatus*

COMMON NAME	SCIENTIFIC NAME
SALAMANDERS	
Amphiuma, Two-toed	*Amphiuma means*
Newt, Red-Spotted	*Notophthalmus viridescens viridescens*
Salamander, Eastern Mud	*Pseudotriton montanus montanus*
Salamander, Eastern Tiger	*Ambystoma tigrinum tigrinum*
Salamander, Many-Lined	*Stereochilus marginatus*
Salamander, Marbled	*Ambystoma opacum*
Salamander, Red-Backed	*Plethodon cinereus cinereus*
Salamander, Slimy	*Plethodon glutinosus glutinous*
Salamander, Souther Dusky	*Desmognathus auriculatus*
Salamander, Spotted	*Ambystoma maculatum*
Siren, Greater	*Siren lacertina*
Waterdog, Dwarf	*Necturus punctatus*
LIZARDS	
Anole, Green (Carolina Anole)	*Anolis carolinensis*
Lizard, Fence	*Sceloporus undulatus hyacinthinus*
Racerunner, Six-Lines	*Cnemidophorus sexlineatus*
Skink, Ground	*Leiolopisma laterale*
Skink, Five-Lined	*Eumeces fasciatus*
Skink, Broad-Headed	*Eumeces laticeps*
Skink, Southeastern Five-Lined	*Eumeces inexpectatus*
Lizard, Eastern Glass	*Ophisaurus ventralis*
FROGS AND TOADS	
Bullfrog	*Rana catesbeiana*
Frog, Brimley's Chorus	*Pseudacris brimleyi*
Frog, Carpenter	*Rana virgatipes*
Frog, Gray Tree	*Hyla chrysoscelis (diploid form)*
Frog, Gray Tree	*Hyla versicolor (polyploid form)*
Frog, Green	*Rana clamitans melanota*
Frog, Green tree	*Hyla cinerea*
Frog, Northern Cricket	*Acris crepitans crepitans*
Frog, Pickerel	*Rana palustris*
Frog, Pine Woods Tree	*Hyla femoralis*
Frog, Southern Cricket	*Acris gryllus gryllus*
Frog, Southern Leopard	*Rana utricularia*
Frog, Squirell Tree	*Hyla squirella*
Frog, Upland Chorus	*Pseudacris triseriata feriarum*
Frog, Little Grass	Limnaoedus ocularis

COMMON NAME	SCIENTIFIC NAME
FROGS AND TOADS (cont.)	
Peeper, Northern Spring	*Hyla crucifer*
Spadefoot, Eastern	*Scaphiopus holbrooki holbrooki*
Toad, Eastern Narrow-Mouthed	*Gastrophryne carolinensis*
Toad, Fowlers	*Bufo woodhousei fowleri*
Toad, Oak	*Bufo quercicus*
Toad, Southern	*Bufo terrestris*

Fish Species List

COMMON NAME	SCIENTIFIC NAME
Longnose Gar	*Lepisosteus osseus*
Bowfin	*Amia calva*
Ladyfish	*Elops saurus*
American Eel	*Anguilla rostrata*
Bay Anchovy	*Anchoa mitchilli*
Gizzard Shad	*Dorosoma cepedianum*
Threadfin Shad	*Dorosoma petenense*
Atlantic Menhaden	*Brevoortia tyrannus*
American Shad	*Alosa sapidissima*
Blueback Herring	*Alosa aestivalis*
Alewife	*Alosa pseudorharengus*
Lake Chubsucker	*Erimyzon sucetta*
Common Carp	*Cyprinus carpio*
Golden Shiner	*Notemigonus crysoleucas*
Sheepshead Minnow	*Cyprinodon variegatus*
Grey Trout	*Cynoscion regalis*
Black Bullhead	*Ictalurus melas*
Brown Bullhead	*Ictalurus nebulosis*
Yellow Bullhead	*Ictalurus natalis*
Channel Catfish	*Ictalurus punctatus*
White Catfish	*Ictalurus catus*
Tadpole Madtom	*Noturus gyrinus*
Eastern mudminnow	*Umbra pygmaea*
Chain Pickerel	*Esox niger*
Redfin Pickerel	*Esox americans*
Atlantic Needlefish	*Strongylura marina*
Banded Killifish	*Fundulus diaphanus*
Marsh Killifish	*Fundulus confluentus*
Mummichog	*Fundulus heteroclitus*
Mosquitofish	*Gambusia affinis*
Tidewater Silverside	*Menidia menidia*
Threespine Stickleback	*Gasterosteus aculeatus*
Northern Pipefish	*Syngnathus fuscus*
Striped Mullet	*Mugil cephalus*
White Mullet	*Mugil curema*
Atlantic Croaker	*Micropogon undulatus*
Spotted Seatrout	*Cynoscion nebulosus*
Spot	*Leiotomus xanthurus*

COMMON NAME	SCIENTIFIC NAME
Nake Goby	*Gobiosoma bosc*
White Perch	*Morone americana*
Stiped Bass	*Morone saxatilis*
Silver Perch	*Bairdiella chrysura*
Spotted Bass	*Micropterus punctulatus*
Yellow Perch	*Perca flavescens*
Flier	*Centrarchus macropterus*
Largemouth Bass	*Micropterus salmoides*
Black Crappie	*Pomoxis nigromaculatus*
Bluespotted Sunfish	*Enneacanthus gloriosus*
Warmouth	*Lepomis gulosus*
Redear Sunfish	*Lepomis microlophus*
Bluegill	*Lepomis macrochirus*
Pumpkinseed	*Lepomis gibbosus*
Blackcheek Tonguefish	*Symphurus plagiusa*
Hogchoker	*Trinectes maculatus*
Summer Flounder	*Paralichthys dentatus*
Southern Flounder	*Paralichthys lethostigma*

Invertebrate Species List

BUTTERFLIES	GLOBAL RANK	STATE RANK
Common Name *(Scientific name)*		
Least skipperling *(Ancyloxypha numitor)*	G5	S5
Zabulon skipper *(Poanes zabulon)*	G5	S5
Large wood nymph *(Cercyonis pegala)*	G5	S5
Monarch *(Danaus plexippus)*	G4	S5
Buckeye *(Junonia coenia)*	G5	S5
Viceroy *(Limenitis archippus)*	G5	S5
Little wood satyr *(Megisto cymela)*	G5	S5
Mourning cloak *(Nymphalis antiopa)*	G5	S5
So. Pearly crescent spot *(Phycoides tharos)*	G5	S5
Red admiral *(Vanessa atalanta)*	G5	S5
Painted lady *(Vanessa cardui)*	G5	S5
American painted lady *(Vanessa virginiensis)*	G5	S5
Tiger swallowtail *(Papilio glaucus)*	G5	S5
Palamedes swallowtail *(Papilio palamedes)*	G5	S4
Black swallowtail *(Papilio polyxenes)*	G5	S5
Orange sulphur *(Colias eurytheme)*	G5	S5
Cloudless giant sulphur *(Phoebis sennae)*	G5	SN
European cabbage white *(Pieris rapae)*	G5	SE

MOTHS*		GLOBAL RANK	STATE RANK
Family	**Species**		
Geometridae	*Semiothisa transitaria*		S5
Geometridae	*Euchlaena obtusaria*		S5
Geometridae	*Xanthotype urticaria*		S4S5
Geometridae	*Eusarca fundaria*		S3S5
Geometridae	*Eusarca confusaria*		S5
Geometridae	*Procherodes transversata*		S5
Geometridae	*Pleuroprucha insulsaria*		S5
Geometridae	*Cyclophora myrtaria*		S1S3
Geometridae	*Orthanama obstipata*		S5
Geometridae	*Orthonama centrostrigaria*		S5
Geometridae	*Eupithecia miserulata*		S4S5
Saturnidae	*Dryocampa rubicunda*		S5

MOTHS (cont.)		GLOBAL	STATE
Family	**Species**	**RANK**	**RANK**
Sphingidae	*Dolba hyloeus*		S4S5
Sphingidae	*Darapsa myron*		S5
Notodontidae	*Datana drexelii*		S4S5
Notodontidae	*Nadata gibbosa*		S5
Notodontidae	*Heterocampa astarte*		S1S2
Notodontidae	*Heterocampa obliqua*		S5
Notodontidae	*Lochmaeus manteo*		S5
Noctuidae	*Crambidia lithosioides*		S4S5
Noctuidae	*Hypoprepia miniata*		S5
Noctuidae	*Holomelina opella*		S5
Noctuidae	*Spilosoma congrua*		S5
Noctuidae	*Hyphantria cunea*		S5
Noctuidae	*Idia americalis*		S5
Noctuidae	*Idia scobialis*		S4S5
Noctuidae	*Tetanolita mynesalis*		S5
Noctuidae	*Plathypena scabra*		S5
Noctuidae	*Pangrapta decoralis*		S5
Noctuidae	*Metalectra discalis*		S5
Noctuidae	*Scolecocampa liburna*		S5
Noctuidae	*Anomis erosa*		SA
Noctuidae	*Metria amella*		S1S2
Noctuidae	*Zale lunata*		S5
Noctuidae	*Zale obliqua*		S4S5
Noctuidae	*Allotria elonympha*		S5
Noctuidae	*Parallelia bistriaris*		S5
Noctuidae	*Doryodes spadaria*		S4S5
Noctuidae	*Catocala muliercula*		S3S5
Noctuidae	*Catocala amica*		S5
Noctuidae	*Pseudoplusia includens*		S5
Noctuidae	*Anagrapha falcifera*		S5
Noctuidae	*Homophoberia apicosa*		S4S5
Noctuidae	*Acronicta tritona*		S3S5
Noctuidae	*Acronicta ovata*		S5

MOTHS (cont.)		GLOBAL	STATE
Family	**Species**	**RANK**	**RANK**
Noctuidae	*Acronicta inclara Sm.complex*		S5
Noctuidae	*Polygrammate hebraeicum*		S5
Noctuidae	*Chytonix palliatricula*		S5
Noctuidae	*Phosphila miselioides*		S5
Noctuidae	*Proxenus miranda*		S4S5
Noctuidae	*Spodoptera frugiperda*		S5
Noctuidae	*Spodoptera ornithogalli*		S5
Noctuidae	*Galgula partita*		S5
Noctuidae	*Amolita obliqua*		S5
Noctuidae	*Lacinipolia teligera*		S2S4
Noctuidae	*Pseudoletia unipuncta*		S5
Noctuidae	*Leucania linita*		S3S5
Noctuidae	*Leucania scirpicola*		SA?
Noctuidae	*Leucania adjuta*		S5
Noctuidae	*Tricholita signata*		S5
Noctuidae	*Agrotis ipsilon*		S5
Noctuidae	*Euxoa detersa*		S4S5
Noctuidae	*Xestia dolosa*		S5
Noctuidae	*Noctua pronuba*		SE
Noctuidae	*Helicoverpa zea*		S5
DRAGONFLIES*			
Family	**Species**		
Aeschnidae	*Anas junius*	G5	S5
Aeschnidae	*Epiaeschna heros*	G5	S4
Aeschnidae	*Gomphaeschna furcilata*	G5	S3
Libellulidae	*Brachymesia gravida*	G5	S3
Libellulidae	*Celithemis eponina*	G5	S5
Libellulidae	*Celithemis fasciata*	G5	S3
Libellulidae	*Erythemus simplicicollis*	G5	S5
Libellulidae	*Libellula incesta*	G5	S5
Libellulidae	*Libellula lydia*	G5	S5
Libellulidae	*Libellula needhami*	G5	S5
Libellulidae	*Libellula semifasciata*	G5	S4
Libellulidae	*Libellula vibrans*	G5	S4
Libellulidae	*Pachydiplax longipennis*	G5	S5

DRAGONFLIES* (cont.)			
Family	**Species**		
Libellulidae	*Pantala flavescens*	G5	S5
Libellulidae	*Tramea carolina*	G5	S5
Libellulidae	*Tramea lacerata*	G5	S5
Coenagrionidae	*Enallagma civile*	G5	S4
Coenagrionidae	*Ischnura hastata*	G5	S4S5
Coenagrionidae	*Ischnura posita*	G5	S5
Coenagrionidae	*Ischnura ramburi*	G5	S3S4

KEY

* = Common names do not exist for most moth and dragonfly species

Virginia Global (G) & State (S) Rarity Ranking Abbreviations

1 = Extremely rare (1-5 occurrences in VA.)
2 = Very rare (5-20 occurrences)
3 = Rare to uncommon (20-100 occurrences)
4 = Common(100+ occurrences)
5 = Very common, secure under present conditions
SA = Accidental in VA
SH = Historically known but not verified for 15+ years
SN = Regularly occurring migrants/transients/seasonal residents
SU = Status uncertain due to low search effort or cryptic nature of element
SX = Apparently extirpated from VA
SE = Exotic, non-native species

Reference

*From: Walton, D. P., N. E. Van Alstine and A. C. Chazal. 2001. *A Natural Heritage Inventory of the Back Bay National Wildlife Refuge.* Natural Heritage Technical Report 01-8. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. 101 pp. plus appendices. Pages 40-47 & Appendix A.

Species of Conservation Concern

PLANTS	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
May hawthorn *(Crataegus aestivalis)*	G5	S1		
White-top fleabane *(Erigeron vernus)*	G5	S2		
Viviparous spikerush *(Eleocharis vivipara)*	G5	S1		
Salt-marsh spikerush *(Eleocharis halophila)*	G4	S1		
Rooted spikerush *(Eleocharis radicans)*	G5	SH		
Coastal water pennywort *(Hydrocotyle bonariensis)*	G5	S1?		
Sea-coast marsh-elder *(Iva imbricata)*	G5	S1S2		
Bog rush *(Juncus elliottii)*	G4G5	S1S2		
Big-headed rush *(Juncus megacephalus)*	G4G5	S2		
Carolina liliaeopsis *(Liliaeopsis carolinensis)*	G3	S1		
American lipocarpha *(Lipocarpha maculate)*	G5	S1		
Winged seedbox *(Ludwigia alata)*	G3G4	S1		
Long beach seedbox *(Ludwigia brevipes)*	G4G5	S2		
Creeping seedbox *(Ludwigia repens)*	G5	S1		
Common frog-fruit *(Phyla nodiflora)*	G5	S1		
White-topped sedge *(Rhynchospora colorata)*	G5	S1		
Savannah beakrush *(Rhynchospora debilis)*	G4?	S1		
Fasciculate beakrush *(Rhynchospora fascicularis)*	G5	S1?		
Spanish moss *(Tillandsia usneoides)*	G5	S2		
Large cranberry *(Vaccinium macrocarpon)*	G4	S2		
Sandpaper vervain *(Verbena scabra)*	G5	S2		
Sawgrass *(Cladium jamaicense)*	G5	S2		
Joint paspalum *(Paspalum distichum)*	G5	S1		
Elliott's aster *(Aster puniceus var. elliotti)*	G5	S1		
Pale grass pink *(Calopogon tuberosus/pulchellus)*	G4G5	SH		
Reniform sedge *(Carex reniformis)*	G4	S1		
Southern beach spurge *(Chamaesyce bombensis)*	G4G5	S2		
Cottony golden aster Chrysopsis gossypina)	G5	S1		
Pineland tick-trefoil *(Desmodium strictum)*	G4	S2		
Hairy fimbry *(Fimbristylis puberula)*	G5	S1		
Seaside heliotrope *(Heliotropium curassavicum)*	G5	S1		
Featherfoil *(Hottonia inflate)*	G4	S2S3		
Coastal water pennywort *(Hydrocotyle bonariensis)*	G5	S1?		
Glossy-seeded stargrass *(Hypoxis sessilis)*	G4	SH		
Pine barren rush *(Juncus abortivus)*	G5	S1S2		
Mudwort *(Limosella australis)*	G4G5	SH		

Elongate lobelia *(Lobelia elongata)*	G4G5	S1		
Joint paspalum *(Paspalum distichum)*	G5	S1		
Dune ground cherry *(Physalis walteri)*	G4	S2		
Darlington's oak *(Quercus hemisphaerica)*	G5	S1		
Bluejack oak *(Quercus incana)*	G5	S2		
Ivy-leaved water crowfoot *(Ranunculus hederaceus)*	G5	SH		
Hard-stemmed bulrush *(Schoenoplectus acutus)*	G5	S1		
Branching burreed *(Sparganium androcladum)*	G4G5	SH		
Fibrous bladderwort *(Utricularia striata)*	G4G5	S1		
Columbia watermeal *(Wolffia columbiana)*	G5	S1		
An amaranth *(Iresine rhizomatosa)*	G5	S1		
Southern magnolia *(Magnolia grandiflora)*	G5	S1/S2		
Unknown *(Sideroxylon lycioides)*	G4G5	S1		
A nutrush *(Scleria verticillata)*	G4G5	S1		
A rush *(Juncus abortivus)*	G5	S1		
Big-headed rush *(Juncus megacephalus)*	G5	S1/S2		
A grass *(Panicum dichotomum)*	G5	S1		
A tiny arrowhead *(Sagittaria calycina ssp. Spongiosa)*	G5	S1S2		
VERTEBRATES				
Loggerhead sea turtle *(Caretta caretta)*	G3	S1	LT	LT
Green sea turtle *(Chelonia mydas)*	G3	S1	LT	LT
Atlantic ridley *(Lepidochelys kempi)*	G2	S1	LE	LE
Piping plover *(Charadrius melodus)*	G3	S2	LT	LT
E. Big-eared bat *(Corynorhinus rafinesquii)*	G3G4	S1	SOC	LT
Bald eagle *(Haliaeetus leucocephalus)*	G4	S2	LT	LT
Peregrine falcon *(Falco peregrinus)*	G2	S1	LE	LE
Least bittern *(Ixobrychus exilis)*	G5	S2		
Eastern glass lizard *(Ophisaurus ventralis)*	G5	S1		LT
King rail *(Rallus elegans)*	G4G5	S2		
Glossy crayfish snake *(Regina rigida)*	G5	S1		
Greater siren *(Siren lacertina)*	G5	S2		
Marsh rabbit *(Sylvaligus palustris)*	G5	S2		SC
INVERTEBRATES				
A funnel-web spider *(Agelenopsis kastoni)*	G4?	S2		
Comet darner *(Anas longipes)*	G5	S2		
A mired bug *(Bathynotus johnstoni)*	G3	S1		
Little metalmark *(Calephelis virginiensis)*	G4	S2		
2-clawed hunting spider *(Castianeira trilineata)*	G4?	S1		
NE beach tiger beetle *(Cicindela d. dorsalis)*	G4	S2	LT	
Spectral tiger beetle *(Cicindela lepida)*	G4	S1		

INVERTEBRATES (cont.)				
A tiger beetle *(Cicindela trifasciata)*	G5	S1		
Combneck assassin bug *(Ctenotrachelus shermani)*	G3	S1		
A gnaphosid spider *(Drassyllus louisianus)*	G4	S1		
Stripe-winged baskettail *(Epitheca costalis)*	G4	S2		
Dukes' skipper *(Euphyes dukesi)*	G3	S2		
Flat-hrnd. grnd beetle *(Helluomorphoides nigripennis)*	G4?	S1		
A burrower bug *(Melanaethus cavicollis)*	G4	S1		
Orange panopoda *(Panopoda repanda)*	G?	S1S3		
Aralia shoot borer *(Papaipema araliae)*	GU	SU		
Nursery web spider *(Pisaurina dubia)*	G4	S1S3		
An assassin bug *(Ploiaria carolina)*	G4?	S1		
An assassin bug *(Ploiaria hirticornis)*	G3?	S1		
An assassin bug *(Pnirontis brimleyi)*	G2	S1		
Yehl skipper *(Poanes yehl)*	G4	S1S3		
A carabid beetle *(Pseudaptinus tenuicornis)*	G?	S1?		
Seashore mired bug *(Pycnoderiella virginiana)*	GU	SU		
A pselaphid beetle *(Rybaxis sp. 1)*	GU	SU		
King's hairstreak *(Satyrium kingi)*	G3G4	S2S3		
Fine-lined emerald *(Somatoflora filosa)*	G5	S2		
Tidewtr.interstitial amphipod *(Stygobromus araeus)*	G2	S2	SOC	SC
Tidewater amphipod *(Stygobromus indentatus)*	G2G3	S2	SOC	SC
A burrower bug *(Tominotus communis)*	G5	S1		
Giant ant-lion *(Vela americana)*	G5	S1S2		

KEY

Virginia Global (G) & State (S) Rarity Ranking Abbreviations
- 1 = Extremely rare (1-5 occurrences in VA.)
- 2 = Very rare (5-20 occurrences)
- 3 = Rare to uncommon (20-100 occurrences)
- 4 = Common(100+ occurrences)
- 5 = Very common, secure under present conditions

SA = Accidental in VA
SH = Historically known but not verified for 15+ years
SN = Regularly occurring migrants/transients/seasonal residents
SU = Status uncertain due to low search effort or cryptic nature of element
SX = Apparently extirpated from VA
SE = Exotic, non-native species

Federal and State Status Abbreviations
LE = Listed endangered
LT = Listed threatened

PE = Proposed for listing as endangered
PT = Proposed for listing as threatened

S = Synonyms
C = Candidate: Status data supports delayed by pending proposals of higher priority taxa.

SOC or SC = Species of Concern

References

Walton, D. P., N. E. Van Alstine and A. C. Chazal. 2001. *A Natural Heritage Inventory of the Back Bay National Wildlife Refuge.* Natural Heritage Technical Report 01-8. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. 101 pp. plus appendices. Pages 40-47 & Appendix A.

Virginia Department of Game and Inland Fisheries. *List of Special Status Species in Virginia.* Updated February 17, 1998.

Appendix D



USFWS

The bald eagle has successfully nested on Back Bay NWR since 1996

Service Asset Maintenance Management System (SAMMS)

Service Asset Maintenance Management System (SAMMS)

WO Number	Asset Number	Title	Cost	Description
ALTERNATIVE B				
110538		Construct New Headquarters / VCS on Tract 244	$5,000,000	The building incorporates the standard, medium-sized design developed by National Wildlife Refuge System and Engineering staffs. The Visitor Center will include exhibitry, site work, and exterior interpretive facilities, in addition to office space for our cooperating association, Back Bay Restoration Foundation.
2007707221		Construct Public Use Trail on Tract 244	$10,000	This trail would be in conjunction with the newly proposed headquarters and VCS on that site. The trail would not be constructed until after construction of the headquarters/ VCS was complete and after the tract was re-forested. This trail would served as the primary public use trail for visitors to the new VCS. It would provide wildlife-dependant recreation.
4133913	10020515	Rehabilitate Existing Headquarters/VCS into Primary VCS Building	$150,000	This project would rehabilitate the majority of the 4,370 sq. ft floor space to enhance wildlife observation and educational experiences for the more than 120,000 annual Refuge visitors. Improvements would include new exhibits, sales outlet for cooperating association, and improved signage and interpretive panels.
94109890	10020504	Realign Entrance Road and Fee Booth	$850,000	This project, begun in FY-09, will continue to re-align the entrance road and fee collection station, add 20-car parking lot at the entrance for hikers and bikers, and build a separate hiking/biking trail to separate the vehicular and non-vehicular traffic to improve public safety.
2006500689		Construct Lotus Garden Canoe/Kayak Launch Facility	$200,000	As part of a new 4-mile, multi-facility canoe birding trail in Back Bay and it's tributaries, this project is part of a cooperative venture with the City of VA Beach to create a network of trails throughout the Bay for wildlife observation. The Lotus Pond facility is located on Asheveile Bridge Creek at Sandbridge Road.
2006500726		Construct Lovett's Landing Canoe/Kayak Launch Facility	$200,000	As part of a new 4-mile, multi-facility canoe birding trail in Back Bay and it's tributaries, this project is part of a cooperative venture with the City of VA Beach to create a network of trails throughout the Bay for wildlife observation. The Lovett's Landing facility is located on Beggars Creek at Muddy Creek Road.
2005254622	10020580	Rehabilitate Water Supply Channel by Dredging	$304,000	This project facilitates critical water level management activities/migratory bird habitat management. Dredging and removal of sediment that has built up in front of the main pump system will allow for more efficient transfer of water out of the impoundments when necessary. This pump system is responsible for water level control throughout the impoundment system, which is critical to providing quality habitat for migratory birds.
2005254601	10020563	Repair Storm Damage to Beach Facilities and Dunes	$116,000	This project would replace worn, damaged, and missing barricades that protect sensitive shorebird habitat on the north mile of the refuge beach. In addition, it would replace worn, damaged, and missing signs and interpretive kiosks that provide information to over 120,000 visitors each year. It would also enhance the refuge dune system by rehabilitating/revegetating along the entrance road which currently lacks vegetation and regularly blows into the public roadway.

WO Number	Asset Number	Title	Cost	Description
ALTERNATIVE B (cont.)				
2005254618	10020503	Replace Brick Shop/ Storage Building	$555,000	This project would replace a delapidated storage building that requires regular maintenance and upkeep. Building is needed to store and protect refuge biological equipment (small boats, beach patrol vehicles), program supplies, and informational signs.
2005199978	10020575	Replace Roof on Bloodworth House	$100,000	Replacement of the roof on this refuge quarters building would prevent costly maintenance of this three-bedroom house. Refuge staff, volunteers, Student Conservation Association/Student Temporary Experience Program employees, etc. utilize this building on a regular basis.
2005198743	10020502	Rehabilitate Gravel Roads on Impoundment Dikes	$980,000	This project would repair gravel roads throughout the 4,500 acre southeastern portion of the refuge, which surround the refuge's moist soil impoundment system. Annual maintenance of these roads provides only temporary passage as holes and ruts require reshaping and significant gravel work to be fully repaired.
2006505604		Rehabilitate B-Pool at Water Control Structure	$8,000	This project facilitates critical water level management activities/migratory bird habitat management. Replacement of this water control structure will allow for more efficient transfer of water out of the impoundment when necessary to provide migratory bird habitat.
200522345	10020598	Remove Hog Raising Parlor Building	$108,000	This project would enable the refuge to remove delapidated and unused hog raising facilities (acquired with property) that currently pose a safety hazard to the public and impede habitat restoration efforts.
2008865108	10020546	Rehabilitate Tram Building for Lighting and Eye Wash	$55,000	This project would provide required safety equipment for refuge staff and volunteers including emergency lighting and an eye wash station.
2005198763	10020597	Remove Hog Raising Building and Concrete Slab (2nd on Left)	$96,000	This project would enable the refuge to remove delapidated and unused hog raising facilities (acquired with property) that currently pose a safety hazard to the public and impede habitat restoration efforts.
2005225344		Remove Hog Raising Building and Concrete Slab (1st on Left)	$96,000	This project would enable the refuge to remove delapidated and unused hog raising facilities (acquired with property) that currently pose a safety hazard to the public and impede habitat restoration efforts.
2006500731		Construct Hell's Point Creek Canoe/Kayak Launch Facility	$200,000	As part of a new 4-mile, multi-facility canoe birding trail in Back Bay and it's tributaries, this project is part of a cooperative venture with the City of VA Beach to create a network of trails throughout the Bay for wildlife observation.
2120860		Construct Interpretive Scenic Byway Improvements	$900,000	Construct interpretive scenic byway improvements for an access and visitor support facilities at locations identified on the newly designated Virginia Birding Trail (VBT) Developing these areas will help promote birding and other wildlife assets to the public and help partners like Virginia and the City of Virginia Beach promote nature tourism.

Appendix E



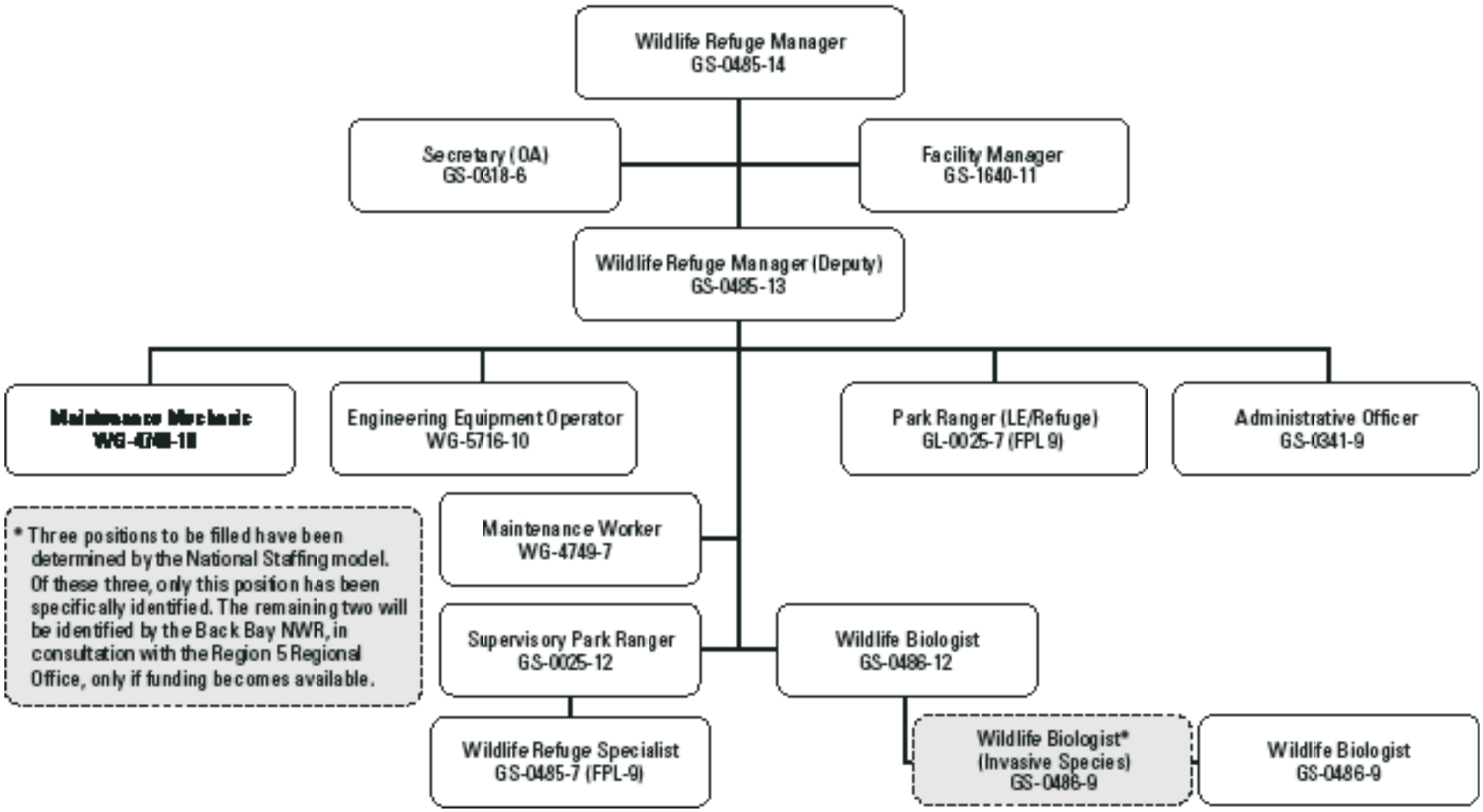
USFWS

Glossy ibis feeding on the impoundments

Refuge Staffing Chart

U.S. Fish and Wildlife Service
Northeast Region
National Wildlife Refuge System
Back Bay National Wildlife Refuge

Alternatives B and C—Proposed Staffing Chart



Appendix E. Refuge Staffing Chart

Appendix F



USFWS

Loggerhead sea turtle hatchlings are released from their nest cages immediately after emerging—often very late at night or the very early morning

Intra-service Section 7 Biological Evaluation Form

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Jared Brandwein
Telephone Number: 757-721-2412
Date: September 10, 2010

I. Region:
Region 5 (Northeast)

II. Service Activity (Program):
National Wildlife Refuge System

III. Pertinent Species and Habitat:

A. Listed species potentially present within the action area:

Federally-designated Endangered and Threatened Species:

1)	Piping plover	(*Charadrius melodus*) [Threatened]
2)	Atlantic ridley	(*Lepidochelys kempii*) [Endangered]
3)	Loggerhead sea turtle	(*Caretta caretta caretta*) [Threatened]
4)	Green sea turtle	(*Chelonia mydas*) [Threatened]
5)	Leatherback sea turtle	(*Dermochelys coriacea*) [Endangered]
6)	Seabeach amaranth	(*Amaranthus pumilus*) [Threatened]

Back Bay National Wildlife Refuge is in the process of preparing a Comprehensive Conservation Plan (CCP) that is vital for the management of the Refuge. The final CCP will provide strategic management direction over the next 15 years, by

- providing a clear statement of desired future conditions for habitat, wildlife, visitor services, and facilities;
- providing Refuge neighbors, visitors, and partners with a clear understanding of the reasons for management actions;
- ensuring Refuge management reflects the policies and goals of the System and legal mandates;
- ensuring the compatibility of current and future public uses;
- providing long-term continuity and direction for Refuge management; and
- providing direction for staffing, operations, maintenance, and developing budget

requests.

The need to develop a CCP for the Refuge is two-fold. First, the Refuge Improvement Act requires that all national wildlife refuges have a CCP in place by 2012 to help fulfill the mission of the System. Second, the Refuge lacks a master plan that clearly establishes priorities and ensures consistent, integrated management among its various programs (i.e. biological, visitor services, administrative, and maintenance).

With the Refuge located in the mid-Atlantic region of the U.S., it provides significant, even critical amounts of habitat for the majority of wildlife species known to occur along the east coast. The Refuge provides habitat for "southern" wildlife species at the northern limits of their range as well as northern species in the southern limits of their range. Nearly 500 vertebrate species and approximately 590 species of vascular plants have been documented at the Refuge. Many invertebrate species also live on the Refuge. The Refuge consists of over 9,035 acres with 15 different habitat classifications, which in-turn provide habitat for a variety of wildlife ranging from forest interior nesting neotropical migrant birds to marine mammals. The coastal location of the Refuge also makes them part of a major migration corridor for a variety of birds, including waterfowl, waterbirds, raptors, and songbirds. Appendix C lists birds, mammals, reptiles, amphibians, fish, butterflies, and plants that can be found at the Refuge.

State-listed endangered or threatened species at the Refuge, not already federally-listed, include the Eastern big-eared bat (*Corynorhinus rafinesquii*) and Eastern glass lizard (*Ophisaurus ventralis*). The American bald eagle (*Haliaeetus leucocephalus*) is a state threatened species.

There is no Federally-designated critical habitat within the action area.

B. Proposed species and/or proposed critical habitat within the action area
None

C. Candidate species within the action area:
Red Knot (*Calidris canutus rufa*)

American Eel Status Review
A status review for the American eel (*Anquilla rostrata*) is currently being undertaken pursuant to the Endangered Species Act. The American eel may be found in a variety of aquatic habitats throughout Back Bay and its watershed, both as adults and young (elvers). The young occasionally gather at Refuge water control structures during impoundment draw-downs.

D. Include species/habitat occurrence on a map.
Maps are found in Chapters 1 through 3 of the draft CCP/EA.

IV. Geographic area or station name and action:
Back Bay National Wildlife Refuge – Comprehensive Conservation Plan. The Refuge is located in SE Virginia, in the City of Virginia Beach.

V. Location:
Maps are found in Chapters 1 through 3 of the draft CCP/EA.

A. Ecoregion Number and Name:
The Mid-Atlantic Coastal Ecoregion

B. County and State:
Virginia Beach, Virginia

C. Section, township, and range (or latitude and longitude):
The Refuge headquarters is located at latitude 36 degrees, 40'19" and longitude -75 degrees, 54'55" (plus or minus 16' GPS error).

D. Distance (miles) and direction to nearest town:
The Refuge is in the rural southeastern part of the City of Virginia Beach, approximately 10 miles from the more urban areas to the north.

E. Species/habitat occurrence:

1) **Piping plovers** are associated with intertidal or strand habitats. Although far from optimum due to steep sand dune slopes, the "North Mile" beach provides the best possible breeding habitat on the Refuge. Plovers may use all beaches on the Refuge during migration.

2) **Atlantic ridley** has not been found nesting on the Refuge beach; however, stranded (dead and live) Atlantic ridleys have been documented.

3) **Loggerhead sea turtles** regularly nest on the four miles of Refuge beach and five miles of beachfront on False Cape State Park, immediately to the south.

4) One **Green sea turtle** is known to have nested on Sandbridge beach (2005), immediately north of the Refuge, which raises the possibility for nests to be found on the Refuge.

5) The **Leatherback sea turtle** is not known to occur on the Refuge, but nesting activity has been documented in Maryland, and there is some potential for the species to occur on the Refuge

6) **Seabeach amaranth** is not known to occur on the Refuge beaches, but habitat conditions may be suitable to support the species, and it may occur in the future.

7) The candidate **red knot** may occur on Atlantic coast beaches in Virginia during migration. They have been recorded on the Refuge, but are not known to occur in large numbers or for extended periods.

For more information and details, please refer to chapter 3, "Affected Environment" of the draft CCP/EA.

VI. Description of proposed action (attach additional pages as needed):
The proposed actions and alternative selected by the Service are described in Chapter 2 of the draft CCP/EA.

VII. Determination of effects:

A. Explanation of effects of the action on species in item III:
Refer to Chapter 4 of the draft CCP/EA for more information and details about proposed management under the CCP.

The proposed actions provide more potential habitat for fish and wildlife species native to the waters, wetlands, and forest associated with the Mid Atlantic Coastal Ecoregion. Back Bay National Wildlife Refuge plans to preserve, manage, and restore some of the last significant natural areas for wildlife in Virginia Beach, Virginia. The Refuge's proposed actions will incorporate methods such as restoration, habitat management, and/or monitoring of important

wildlife habitats, ranging from coastal systems to mature forests. The proposed management actions presented in the CCP will provide support for threatened and endangered species in addition to hundreds of species of migratory birds and other wildlife within the Atlantic Flyway. Future actions will be coordinated with the Virginia Dept. of Game and Inland Fisheries, Virginia Aquarium and Marine Stranding Center, Virginia Dept. of Environmental Quality, Virginia Dept. of Conservation & Recreation and the USFWS Virginia Ecological Services Field Office in Gloucester, VA.

From the draft CCP/EA, (Chapter 2, Actions Common to All Alternatives), Goal 4 states we will provide healthy natural environments for native fish, wildlife, and plant populations (with special consideration to those species whose survival is in jeopardy). Proposed actions include patrolling beaches for active sea turtle nests and conducting appropriate management to protect sea turtle nests. The Refuge will work with partners to evaluate and reassess sea turtle nest management in light of the January 2009 revised loggerhead sea turtle recovery plan. Nest management may include relocation of turtle nests following Refuge protocols.

Consultation on sea turtle nest management will be completed separately following the reassessment of nest management practices in conjunction with Refuge partners and development of a detailed revised nest management protocol, if appropriate. Consultation on sea turtle nest management will be completed prior to May 2011, when sea turtle nest management activities are expected to begin again.

Refuge biological staff have carefully studied differences between relocated sea turtle nests, and those left in place ('in situ') during 2003-2005. In addition, Refuge biologists have developed an extensive and detailed protocol for nest relocations during the past 15 years. Using Refuge protocols, nearly all viable, relocated turtle nests have experienced much higher hatching success rates, than those left "in situ". Refuge protocols are expected to be adopted for relocations that occur following the reassessment of sea turtle nest management procedures.

Limiting vehicle access and recreational uses on the Refuge will avoid and minimize potential disturbance of beach-associated species. However, Refuge activity, limited public use, and species and habitat monitoring activities, and other similar activities, may result in disturbance of beach-associated species. This disturbance is expected to be temporary and limited in extent and duration. Because of the relatively low likelihood of the occurrence of a listed species on the beach and the low likelihood, frequency, and duration of disturbance, the effects are anticipated to be insignificant and discountable.

Information on the occurrence of listed species and their habitats is frequently updated; thus, Refuge staff will continue to consult with the Service's Ecological Services (ES) Branch and the Virginia Department of Conservation & Recreation's Natural Heritage Division, prior to initiation of any action that may affect State- or Federally-listed species or their habitat.

B. Explanation of actions to be implemented to reduce adverse effects:
As explained above, implementation of the proposed alternative in the CCP will result in beneficial effects to the listed species described above; or that any direct, indirect, or cumulative adverse effects that may result will be insignificant or discountable. To ensure that habitat restoration activities and other management actions in listed species habitat will have no adverse effects, these actions will be performed outside listed species growing/breeding seasonal windows.

VIII. Effect determination and response requested: [* = optional]

A. List species/designated critical habitat:

Determination	Response requested
No effect/No adverse modification **Species:** Atlantic ridley sea turtle, American eel	___*___ Concurrence
May affect, but is not likely to adversely affect species/adversely modify critical habitat **Species:** 1) Loggerhead sea turtle 2) Piping plover 3) Green sea turtle 4) Leatherback sea turtle 5) Seabeach amaranth 6) Red knot (candidate)	___X___ Concurrence
May affect, and is likely to adversely affect species/adversely modify critical habitat **Species:** None	_____ Formal Consultation

[signature] 9/13/2010

Signature **Date**

[Title/office of supervisor at originating station]

IX. Reviewing ESO Evaluation:

A. Concurrence ___X___ **Nonconcurrence** _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

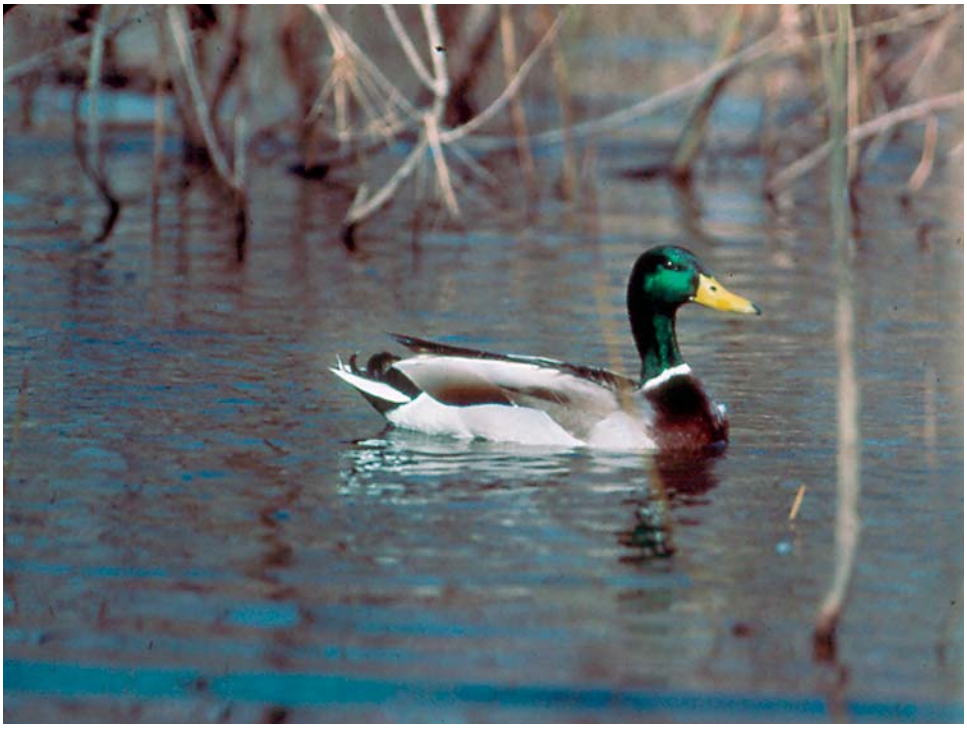
Cynthia A Schulz 9/15/2010

Signature **Date**

[Title/office of reviewing official]

VAFO Project Leader

Appendix G



USFWS

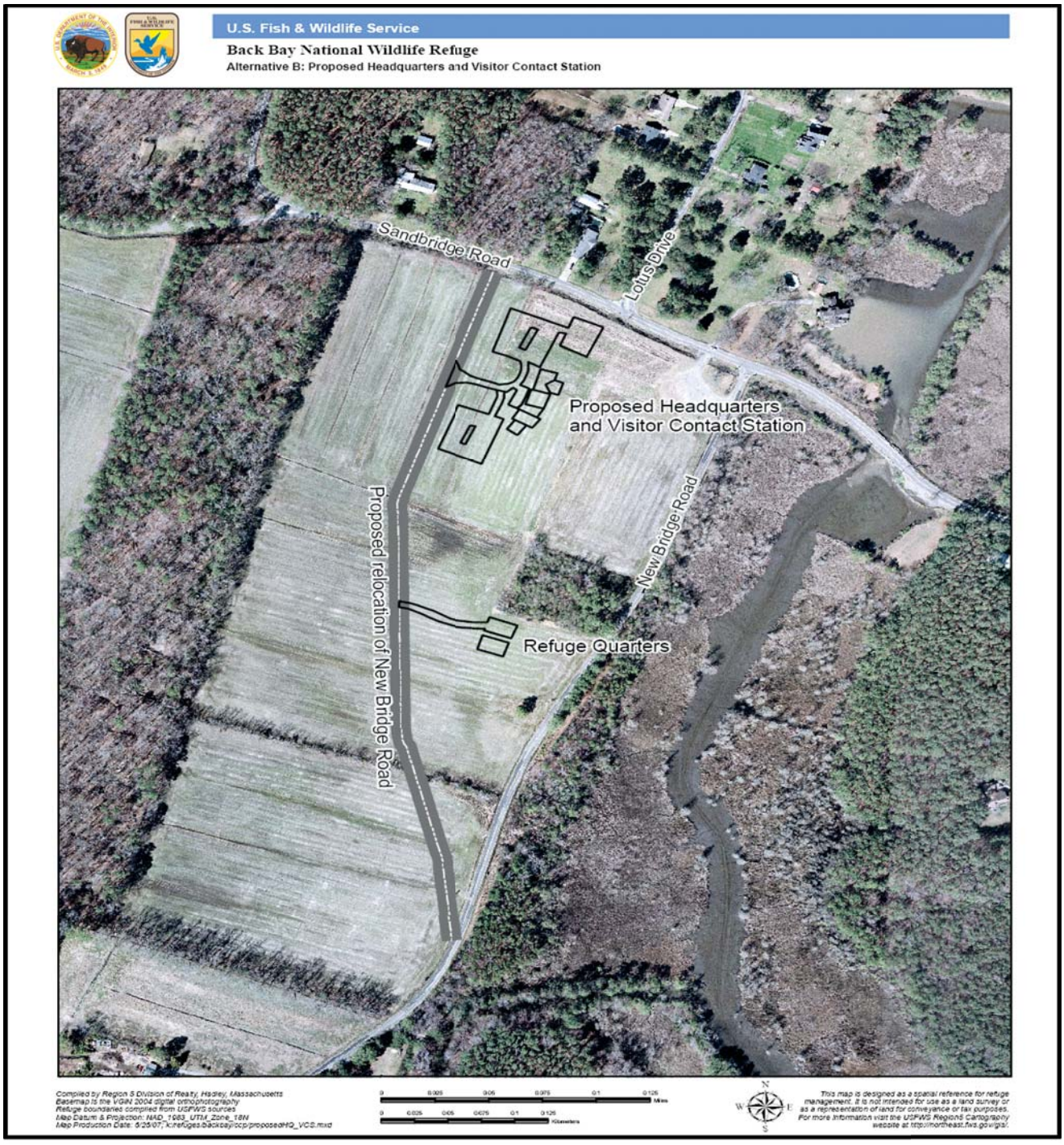
The mallard is common during the winter at Back Bay NWR

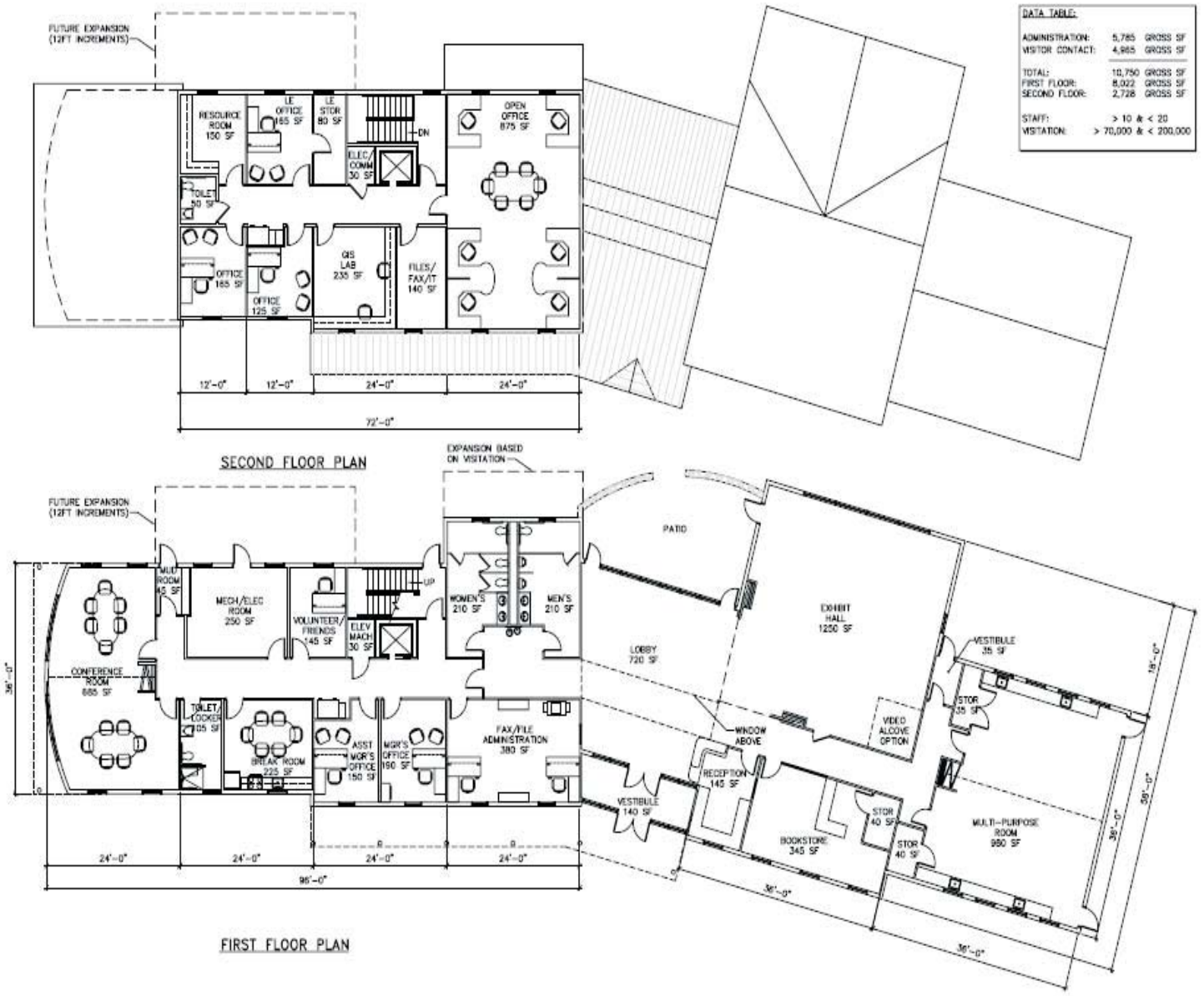
Conceptual Plans

Introduction

The plans for the headquarter/visitors contact station will be located at the corner of New Bridge and Sandbridge Road. This building will incorporate environmental education, visitor center, and maintenance compound. The map below provides an aerial view of the proposed site described in the Management Direction in chapter 4. Please refer to Map 4-2 in Chapter 4 for details on the location of the headquarters in relationship to the entire refuge.

The figures that follow are standard plans from the Region 5 family of buildings for a medium-sized facility in this management action. This plan gives a general overview of what the proposed visitor center and headquarters will look like. Please note that the final design will vary.





SUITE OF FACILITIES

US DEPARTMENT OF THE INTERIOR / US FISH AND WILDLIFE SERVICE

OCTOBER 25, 2005

2 STORY MEDIUM ADMINISTRATION / VISITOR FACILITY

FLOOR PLANS

OAK POINT ASSOCIATES

ARCHITECTURE ■ ENGINEERING ■ PLANNING

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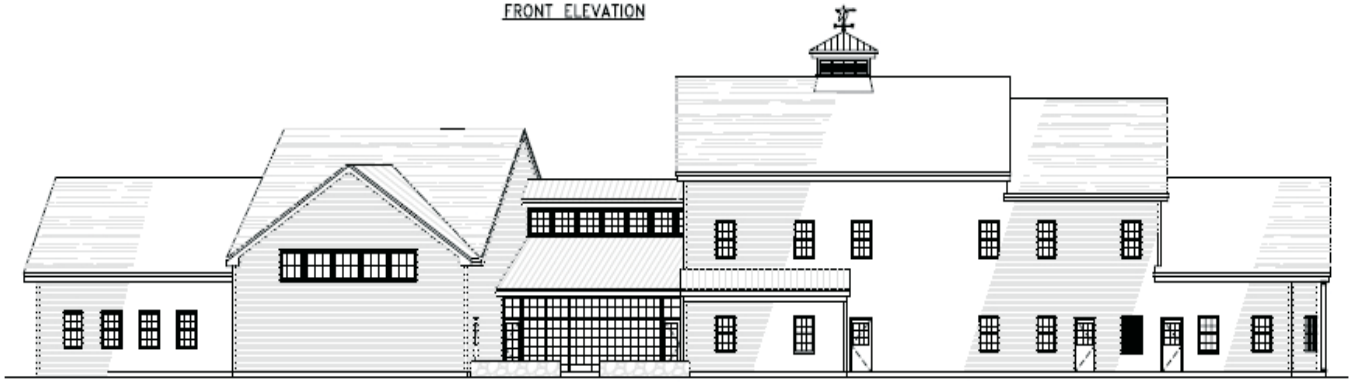
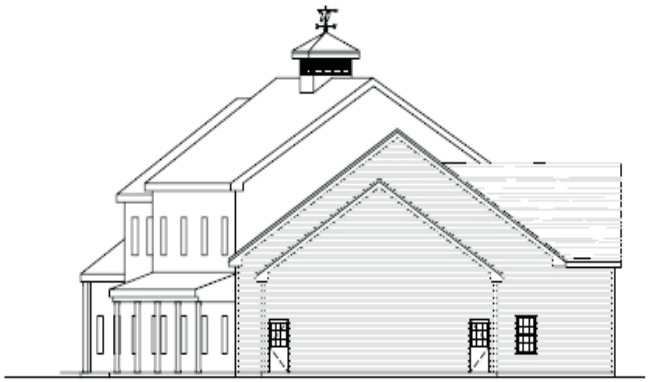
FRONT ELEVATION



REAR ELEVATION



LEFT ELEVATION



RIGHT ELEVATION

SUITE OF FACILITIES

US DEPARTMENT OF THE INTERIOR / US FISH AND WILDLIFE SERVICE

OCTOBER 25, 2005

2 STORY MEDIUM ADMINISTRATION / VISITOR FACILITY

ELEVATIONS

OAK POINT ASSOCIATES

ARCHITECTURE ■ ENGINEERING ■ PLANNING

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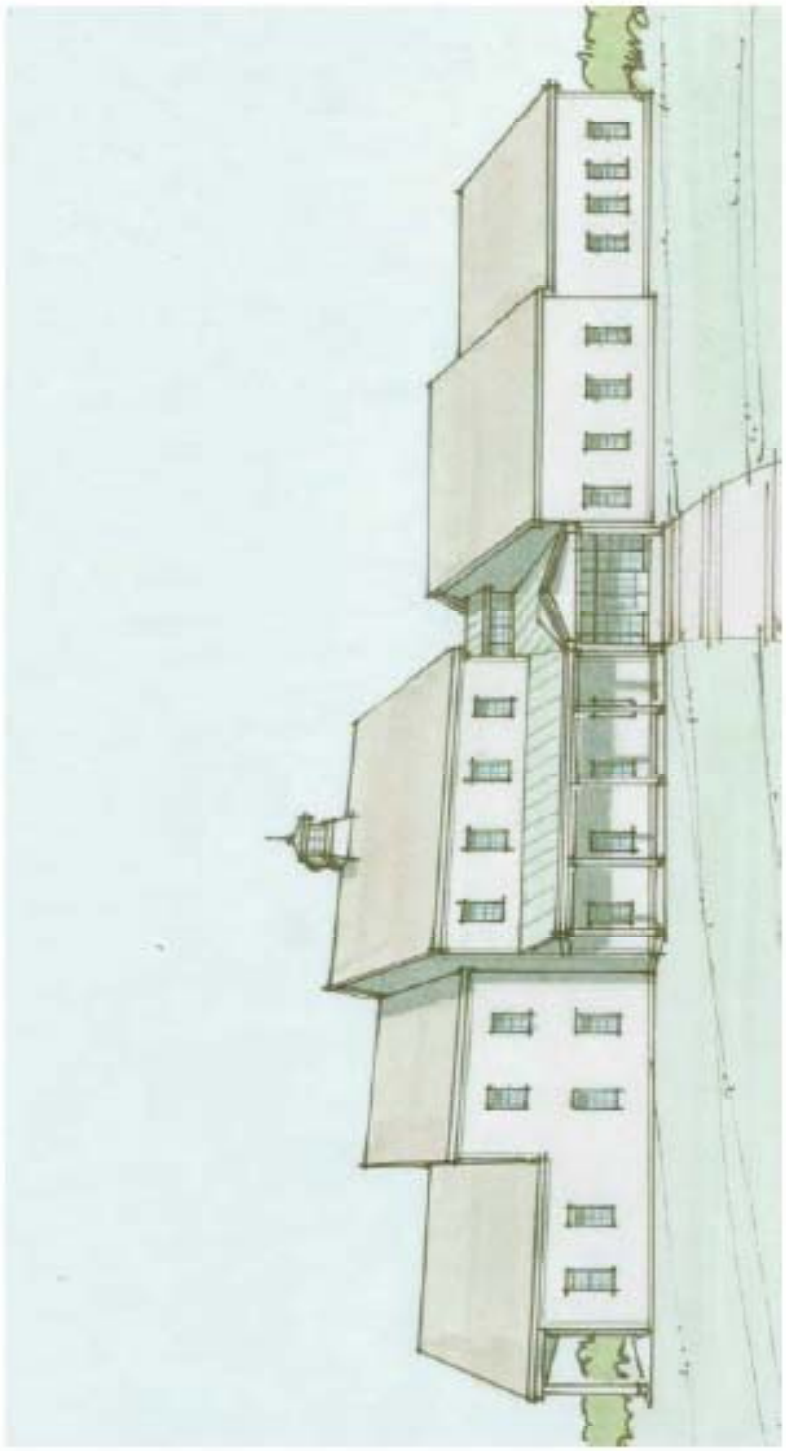

SUITE OF FACILITIES

US DEPARTMENT OF THE INTERIOR / US FISH AND WILDLIFE SERVICE

OCTOBER 25, 2005

2 STORY MEDIUM ADMINISTRATION / VISITOR FACILITY

PERSPECTIVE

OAK POINT

Appendix H



USFWS

Pier at sunset

Recreational Fishing Management Plan

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BACK BAY NATIONAL WILDLIFE REFUGE
VIRGINA BEACH, VIRGINIA

RECREATIONAL FISHING MANAGEMENT PLAN



SEPTEMBER 2009

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BACK BAY NATIONAL WILDLIFE REFUGE

RECREATIONAL FISHING MANAGEMENT PLAN

I. INTRODUCTION

Back Bay National Wildlife Refuge was established to provide habitat for migrating and wintering waterfowl, particularly greater snow geese, and to protect upland and wetland habitats to benefit rare, threatened, and endangered species. Today, the Refuge continues to be an important link in the chain of national wildlife refuges located along the Atlantic Flyway.

The Back Bay area has long been famous as a wildfowler's paradise where once large concentrations of wintering waterfowl and shorebirds could be found. Before the Refuge's establishment on June 6, 1938 by Executive Order #7907, the Princess Anne and Ragged Island Hunting Clubs occupied the site. Other well known hunt clubs in the Back Bay area include the Dudley Island Club, the False Cape Gunning Club, the Cedar Island Club, and the Back Bay Gunning Club. Many of these hunt clubs were founded in the late 1800s and attracted wealthy professionals from as far away as New York and Philadelphia. The Refuge was established in cooperation with the State of Virginia to protect valuable wintering waterfowl habitats, the estuarine system, and the water quality of the Back Bay watershed.

Prior to acquisition by the Federal government, the barrier beach portion was generally flat and sandy. The saline soils were unproductive. Periodic nor'easters and hurricanes pushed large quantities of sea water across these flat beaches and into Back Bay. During the early 1930's the Civilian Conservation Corps built brush fences and planted cane and bulrush to catch moving sands; thus building and stabilizing new sand dune formations. Later, wooden sand fences were constructed and many dunes were planted with beachgrass. These new dunes protected the bayside flats from oceanic waters and permitted formation of a brackish marsh that evolved into the existing oligohaline (salinity of <5 ppt) wetlands complex called Back Bay.

Today, more than 125,000 nature enthusiasts from all over the world visit the Refuge annually, including approximately 12,000 visitors who participate in fresh and/or saltwater recreational fishing.

II. MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM

In 1997, the National Wildlife Refuge System Improvement Act was passed. This law 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 first and foremost, that 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.

"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 with in the United States for the benefit of present and future generations of Americans."

—Refuge Improvement Act; Public Law 105-57

The Refuge Improvement Act identifies six wildlife-dependent public uses — hunting, fishing, wildlife observation, photography, environmental education and interpretation — that will receive priority consideration on refuges and in CCPs. The Act also declares that all existing or proposed refuge uses must be "compatible" with the Refuge's purpose and consistent with public safety. The refuge manager determines if an existing or proposed use is "compatible" by evaluating its potential impact on refuge resources, insuring that the use supports the System mission and does not materially interfere with, or detract from, the purpose for which the refuge was established.

III. CONFORMANCE WITH STATUTORY AUTHORITIES

There are several mandates that apply to fishing on national wildlife refuges, and that provide a legal framework and authority for recreation and public use of refuge lands. They are:

A. The National Wildlife Refuge System Administration Act of 1966, as Amended by the National Wildlife System Improvement Act of 1997

This Act consolidated the various categories of lands administered by the Secretary of the Interior through the Service into a single National Wildlife Refuge System. The Act establishes a unifying mission for the Refuge System, a process for determining compatible uses of refuges, and a requirement for preparing comprehensive conservation plans. This Act states first and foremost that the mission of the National Wildlife Refuge System be focused singularly on wildlife conservation. This Act identifies six priority wildlife-dependent recreation uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation), clarifies the Secretary's authority to accept donations of money for land acquisition, and places restrictions on the transfer, exchange, or other disposal of lands within the refuge system. Most importantly, this Act reinforces and expands the "compatibility standard" of the Refuge Recreation Act. The Refuge Administration Act

authorizes the Secretary, under such regulation as he/she may prescribe, to "permit the use of any area within the System for any purpose, including but not limited to hunting, fishing, public recreation and accommodation, and access whenever he/she determines that such Uses are compatible with the major purposes for which such areas were established."

B. Executive Order 12996 (March 25, 1996)

This Executive Order, entitled "Management and General Public Use of the National Wildlife Refuge System," contains a directive to "..recognize compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority general public uses of the Refuge System..."

C. Refuge Recreation Act

The Recreation Act requires that any recreational use on areas of the National Wildlife Refuge System be "compatible" with the primary purpose(s) for which the area was acquired or established. This Act also requires that sufficient funding be available for the development, operation and maintenance of recreational uses that are not directly related to the area's primary purpose(s).

D. Endangered Species Act

The Endangered Species Act of 1973, as amended, did not specifically address the Refuge System but it does directly affect management activities within the National Wildlife Refuge System. The Act directed Federal agencies to take actions that would further the purposes of the Act and to ensure that actions they carry out, authorize, or fund do not jeopardize endangered species or their critical habitat.

E. The Code of Federal Regulations (CFR), Title 50

Section 31 .2(e) lists fishing as a method of surplus wildlife population control.
Section 31.15 states that the privilege of fishing may be extended to the general public.
Section 32.4 states that the opening of a wildlife refuge area to fishing may occur only after a determination is made that the activity is compatible with the purposes for which the refuge was established, and that the program is consistent with the principles of sound fishery management and will otherwise be in the public interest.
Section 32.5 has provisions applicable to each person engaged in public fishing on a wildlife refuge area.
Section 32.6 explains the procedure for publication of special regulations

The Refuge recreational fishing program supports public use objectives of the Refuge System Improvement Act, Executive Order 12996, and the Refuge System Centennial Act. The program also complies with compatibility requirements set forth in the Refuge System

Improvement Act and the Refuge Recreation Act (see compatibility determination on sport fishing). Endangered species concerns are addressed in an intra-Service Endangered Species Consultation which confirms that the recreational fishing program will have no impact on Federally threatened or endangered species.

Section 26.34 lists access regulations specific to Back Bay National Wildlife Refuge, including special use permitted motor vehicle access and related restrictions on the Refuge oceanfront, prohibited access into the Refuge dune line, means of entry to the Refuge, and the fact that the Refuge is open to public use, including surf fishing, from one half hour before sunrise to one half hour after sunset.

IV. DESCRIPTION OF THE REFUGE

The approximately 9,200 acre Refuge is located in southeastern Virginia within the southeastern portion of the city of Virginia Beach. The City of Virginia Beach is bounded to the east by the Atlantic Ocean, to the south by Currituck County and North Carolina, to the west by the cities of Chesapeake and Norfolk, Virginia, and to the north by the Chesapeake Bay. Land use patterns divide the City into three sections. The northern section is the higher density urban and residential region. The southern section is the rural region. The mid-section or "Transition Zone," provides a mixed density transition between the urban north and rural south. The boundary between the urban north and Transition Zone is known as the "Green Line." Currituck Sound lies south of the City, with North Landing River, Back Bay and the Albrmarle-Pamlico Estuarine system in North Carolina, being the primary water sources. The City of Virginia Beach is one of the biggest resort cities on the Atlantic coast and continues to expand as area tourism grows and the resident population continues to increase.

The Refuge exists within the Back Bay watershed. It currently makes up roughly 25% of the watershed. The watershed has been defined as an oligohaline (nearly fresh) estuary (Norman 1990). The usual salinity of Refuge waters ranges from 0-3 parts per thousand (ppt). Back Bay is the northern tip of the Environmental Protection Agency (EPA)-recognized Albemarle-Pamlico National Estuarine System (APES). Most of APES runs south into coastal North Carolina and consists of Currituck Sound, Albemarle Sound, and Pamlico Sound and associated waterways. Because of its location, 80 miles north of the nearest ocean inlet (Oregon Inlet, NC), Back Bay experiences no lunar tide. Instead, the watershed experiences "wind tides" that keep Bay water levels high or *low* for prolonged periods, in keeping with the prevailing wind direction and speed. These wind tides, when coupled with precipitation and input from the watershed, determine salinity levels of Back Bay waters.

The Refuge consists mostly of open water, barrier island beach and sand dunes, shrub-scrub, bottomland and upland forests/woodlands, and emergent marshes. The immediate surrounding environment is residential, rural agriculture, barrier dunes, inland water, and ocean front. The area just north of the Refuge is urban. The Refuge's unique location mid-way

along the Atlantic Coast provides for a high diversity of plant, animal and fish species, because southeastern Virginia and northeastern North Carolina sustain both northern and southern species at their geographic range limits.

The Refuge has doubled its size since the early 1990s (Table H.1). Recent land acquisitions open up possibilities for visitor facilities along the western border of the Refuge (Appendix H Map 1). One such location, the Horn Point Canoe/Kayak launch site, has already been developed.

Table H.1. Refuge land acquisition since being established in 1938.

Refuge Acquisition History	
Date of Acquisition	**Acreage**
1938 (as originally established)	**4588.76**
1990	**455.08**
1991	**95.03**
1992	**2096.23**
1993	**410.29**
1994	**229.13**
1995	**98.43**
1996	**275.25**
1997	**67.62**
2000	**327.14**
2001	**51.22**
2002	**201.54**
2004	**84.92**
2005	**14.06**
2006	**40.31**
2007	**29.24**
2008	**87.82**
TOTAL	**9,152.07**

V. REFUGE PURPOSE

The original 1938 Executive Order established Back Bay NWR "*.... as a Refuge and breeding ground for migratory birds and other wildlife.*" Another of the Refuge's primary purposes (for lands acquired under the Migratory Bird Conservation Act) is for "*... use as an inviolate sanctuary, or for any other management purpose, for migratory birds.*" The Emergency Wetlands Resources Act of 1986 also authorizes purchase of wetlands for the purpose of "...

the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions .. ..," using money from the Land and Water Conservation Fund (LWCF).

In 1939, 4,600 acres of open bay waters within the Refuge boundary were closed to the taking of migratory birds by presidential proclamation. This boundary is referred to as the Refuge Presidential Proclamation Boundary (Appendix H Map 1).

The Refuge includes approximately five miles of oceanfront beach, a 900-acre freshwater impoundment complex, numerous Bay islands, bottomland mixed forests, old fields, and freshwater wetlands adjacent to Back Bay and its tributary shorelines.

The Back Bay NWR Station Management Plan (1993) expanded the role of the Refuge to include management emphases on other migratory bird groups, including threatened and endangered species, shorebirds, wading birds, marsh birds and songbirds/landbirds.

A. Refuge Vision Statement

The following Refuge vision was developed during preparation of the Refuge Comprehensive Conservation Plan as the guiding philosophy and sense of purpose for our planning effort.

Back Bay National Wildlife Refuge will work closely with partners and communities to provide a biologically healthy natural environment that restores abundant fish, wildlife and plant populations. Special consideration will be given to those species whose survival is in jeopardy. In keeping with the Refuge System mission, we will provide a healthy haven of land and water to support Back Bay's diverse wildlife communities, with an emphasis on migratory waterbird and songbird management. We will strive to promote active stewardship of these natural resources for present and future generations, while also providing opportunities for compatible public uses. In doing this, we hope to ensure a sound coexistence between wildlife and people that will allow people to share our passion and appreciation of Back Bay's many natural resources, while also enhancing the quality of life in Back Bay.

B. Refuge Goals

The Refuge CCP planning team developed the following goals after reviewing the Refuge purposes, the mission of the Service and Refuge System, our proposed vision, public and partner comments, and the mandates, plans and conservation strategies mentioned above:

Goal 1: Maintain and enhance a diversity of wetland habitats for migratory birds.

Goal 2: Enhance and preserve native woodland diversity and health.

Goal 3: Manage beach and dunes to preserve and protect migratory bird and other wildlife habitats.

Goal 4: Provide healthy natural environments for native fish, wildlife, and plant populations (with special consideration to those species whose survival is in jeopardy).

Goal 5: Provide additional viewing opportunities of migratory birds and other wildlife to increase the general public's appreciation and support of natural resources.

Goal 6: Provide and expand hunting and fishing opportunities to the public where compatible with Refuge purposes.

Goal 7: Promote understanding and appreciation for the conservation of fish, wildlife and their habitats and the role of the Refuge in this effort through effective community outreach programs and partnerships.

VI. STATEMENT OF OBJECTIVES

Where appropriate and compatible, the Refuge will be open to recreational fishing, and will mirror State regulations, except for additional regulations that protect migratory birds and threatened and endangered species use(s), and to maintain a self-sustaining, healthy fishery. Additional restrictions may take the form of seasonal closures, catch and release, type of bait allowed, prohibition of lead sinkers, and time of day for fishing access.

The Refuge, in cooperation with the State of Virginia, will take an adaptive management approach to maintaining the fishery resources of the Refuge. A partial baseline of the freshwater fishery and related water quality has been established, from which we can measure changes over time. The Refuge will cooperatively implement the changes necessary to ensure that its fishery resource remains healthy and sustainable.

A. Fishing Objectives

- To provide the general public with safe, high quality, wildlife-oriented recreation and an opportunity to utilize a renewable resource.
- To cooperatively maintain fish populations at optimum levels.
- Back Bay National Wildlife Refuge will provide a quality fishing program that is managed to minimize conflicts with other Refuge uses.
- Within 5-7 years of CCP approval, expand high-quality fishing opportunities on the Refuge.

B. Rationale for Objectives

During the Refuge expansion proposal in the 1990's, the Refuge committed to working with the City of Virginia Beach to provide additional public access to Back Bay for uses compatible with Refuge purposes. There are limited shoreline public access points on Back Bay. The expansion of the existing fishing program is in response to the high demand for recreational fishing on the Refuge. The National Wildlife Refuge System Improvement Act of 1997 also states "that compatible wildlife-dependent recreational uses are legitimate and appropriate, priority general public uses of the Refuge System and . . . are to receive enhanced consideration in planning and management" (US Fish and Wildlife Service). A fishing plan for the Back Bay National Wildlife Refuge will provide specific areas open to fishing, compatibility, and the regulations/restrictions that will be enforced.

Recreational fishing will provide the general public with a wildlife-dependent recreational opportunity. It will promote appreciation and wise use of Refuge aquatic resources. There will be opportunity to observe natural relationships and the diversity necessary for a healthy ecosystem. The public will gain valuable knowledge through brochures, maps, and interpretive literature available and distributed at the Refuge. Special fishing events will help to further instill a conservation ethic and stewardship of natural resources. Regulation and information signs will also be available at each site open for fishing. Through these resources the public will attain an understanding of natural resource management and of the Service's role in preserving and protecting natural resources. Visitors will also form an appreciation and an awareness of the roles they play within the ecosystem. By utilizing this knowledge, the public will be able to participate in solving problems facing wildlife/wildland resources.

C. Strategies

- Cooperate with Virginia Department of Game and Inland Fisheries (VDGIF) to maintain freshwater fisheries resources
- Close Refuge barrier beach portion to public access, including fishing during the annual feral hog/white-tailed deer hunt on designated days in October
- Cooperate with Virginia Marine Resource Commission (VMRC) to maintain saltwater fisheries resources
- Maintain partnerships with fishing interests groups to enhance public fishing opportunities
- Open a designated area on the Refuge ocean front to night surf fishing
- Annually adjust the fishing program for safety, biological, and recreational purposes
- Maximize safety for anglers and visitors
- Cause no adverse impacts to resident or migratory species, or their habitat(s)
- Encourage the highest standards of ethical behavior in regard to catching, attempting to catch, and releasing fish
- Make fishing available to a broad spectrum of the public that visits, or potentially would visit, the Refuge
- Provide reasonable accommodations for individuals with disabilities to participate in Refuge fishing activities

- Reflect positively on the System
- Provide un-crowded conditions
- Create minimal conflict with other priority wildlife-dependent recreational uses or Refuge operation
- Provide reasonable challenges and harvest opportunities
- Increase the visitors' understanding and appreciation for the fisheries resource

VII. RECREATIONAL FISHING RESOURCES AND OPPORTUNITIES

A. WETLAND HABITATS – IMPOUNDMENTS

During the 1930's, a dune system was created along the Refuge beach front. The Civilian Conservation Corps built brush fences and planted cane and bulrush to catch the blowing sand. Later on, beach grass was planted to stabilize the dunes. This protected the bayside flats and, by the 1970's, Back Bay NWR converted approximately 650 acres of mostly un-vegetated "wash flats" to freshwater impoundments. These impoundments evolved from a simple "ring dike" system with 3 units, to an efficient, manageable system that includes 10 units with two storage pools, water control structures, and a water pump that allows water levels to be altered throughout the year. Wildlife management of this area involves surveys of population size and species diversity to determine use trends in combination with the control of undesirable species and encouragement of desirable species, through mechanical, chemical and aquatic habitat management tools. The impoundments include A-pool, B-pool, C-pool, D-pool, E-pool, G-pool, H-pool, J-pool and two water storage pools, C-Storage and B-Storage Pools.

1. D-Pool

D-Pool is currently the only impoundment designated for recreational fishing activities. This small 17-acre unit is a short walk from the visitor contact station.



D-Pool

The area supports upland grasses, wax myrtles and small patches of three-square and black needle rush. The interior perimeter consists of wide, deep-water ditches that support a viable game-fish population. Areas adjacent to the deep-ditch are shallower to support spawning and baitfish/prey populations. Disabled accessible parking is available at this site, which also includes an accessible 500 square foot fishing platform (See Appendix H Map 2). Other anglers must park in the Visitor Contact Station parking area and hike the approximate 50 yards to the impoundment.

In addition, to the existing Virginia Department of Game and Inland Fisheries (VDGIF) freshwater fishing regulations, current Refuge management policy for D-pool is catch and release, except for a maximum of 10 non-game fish that may be kept.

No live minnow bait is permitted and barbless or flattened hooks are required. Visitors may fish from this pier or along the entire length of the impoundment. No watercraft of any type is permitted in the impoundment. There is a pack it in-pack it out trash disposal policy for this site. No other impoundments are presently proposed to be opened for recreational fishing (See Appendix III for Fish Species).

B. BAY—EXISTING FISHING FACILITIES AND OPPORTUNITIES

1. Headquarters Bulkhead and Multi-purpose Pier

In 2005, Back Bay National Wildlife Refuge partnered with U.S. Army Corps of Engineers, Ducks Unlimited, and the Commonwealth of Virginia to construct a new 11-foot wide by 116-foot long timber multipurpose pier to accommodate public fishing, wildlife viewing, and administrative boat launching. Located just west of the Refuge Headquarters overlooking the Bay, this multi-purpose disabled accessible pier and bulkhead offers freshwater fishing as well

as an opportunity to observe and photograph wildlife at its finest. In addition, three riprap breakwaters were constructed for shoreline protection. The shoreline bulkhead in this location is open to fishing, and there is a public canoe/kayak launch site to the immediate right of the pier. No public boat launching or mooring is permitted from the pier (See Appendix H-2).



Headquarters Bulkhead and Multi-purpose Platform

2. Horn Point Canoe/Kayak Launch Site

In the late 1980's and early 1990's, Back Bay NWR sought to increase its boundary to protect water quality of the Back Back Bay watershed. Working with the City of Virginia Beach through a variety of forums, the boundary expansion was approved and incorporated into the City's comprehensive plans. At that time, Back Bay NWR promised to review newly acquired areas for potential compatible public uses. Since that time, Refuge staff has worked extensively with City staff, combining expertise to plan for increased protection of the environmentally sensitive Back Bay watershed, while allowing for consideration of compatible public uses of the watershed. As the human population of Virginia Beach increases, these goals become harder to achieve. Increased human population surrounding the Back Bay watershed contributes to water quality degradation (through both direct and indirect activities) and increased use conflicts between humans and wildlife. These growth conflicts can only be resolved through the continuing full cooperation of the City of Virginia Beach and Back Bay NWR. A cooperative agreement for restoration and enhancement projects between the City of Virginia Beach and Back Bay NWR is critical for the protection of Refuge resources, in the face of increasing demand for public recreational opportunities.



Horn Point Canoe/Kayak Launch Site

The first project to come out of this agreement was the development of Refuge property at 1008 Horn Point Road. Historically, the area adjacent to this tract has been used as an "unofficial" launch area for duck hunters, jet skiers, power boaters, canoeists, and kayakers. By providing a monitored facility that primarily encourages use by canoes and kayaks, both the City of Virginia Beach and Back Bay NWR hope to increase compatible human use and discourage incompatible use by high powered watercraft. The Horn Point Canoe/Kayak Launch Site is a 1 acre site with a through way for easy access in/out for launching. Parking is on a first come first serve basis, disabled parking is available, and restroom/trash disposal are on the premises. There is also a 28 ft. trailer pad with hook-ups meant for occupancy by a resident volunteer host. The Canoe/ Kayak Launch site will also offer a multi-purpose wildlife observation/fishing platform and a raised boardwalk level with the cement walk way leading out to the launching site. The proposed wildlife observation/fishing platform will extend over the existing shoreline rip rap and into the water where no submerged aquatic vegetation (SAV) is currently present. For safety reasons no fishing will be permitted from the existing rip-rapped shoreline at the site.

Any reduction in the area's use by jet skis will serve to decrease the rate of shoreline erosion, decrease negatively impacting human/wildlife interactions, and improve water quality. Horn Point Canoe/Kayak Launch Site is open seasonally from April 1st through October 31st from dawn to dusk, and closed November 1st through March 31st, except by special use permit. During the open season there is a resident volunteer host to welcome visitors and maintain the site (See Appendix H Map 3).

3. Black Gut

Black Gut is a freshwater pond surrounded by emergent marsh and mixed bottomland hardwood/pine woodlands. It is approximately 150 acres of open water and adjacent marsh. The shallow system averages a depth of 3-4 feet dependent upon rainfall.

With limited accessibility, Black Gut provides a more primitive recreational fishing experience than other more accessible and/or developed fishing sites on the Refuge. It is an ideal location for those who want to pursue a more remote fishing experience. There is an existing trail that leads to the fishing area. Currently there are no plans to improve the site other than to maintain the trail leading to the lake. The site will be managed for public fishing according to its current primitive condition (See Appendix H Map 6).

C. OCEANFRONT –EXISTING FACILITIES AND OPPORTUNITIES

The Refuge's oceanfront is popular for surf fishing, which is currently permitted year- round during daylight hours. Saltwater fishing access is via the Seaside Trail and Dune Trail on the eastern side of the Refuge. The Refuge is closed to all public entry from one half-hour after sunset to one half-hour before sunrise. This closure will include entry for night fishing.

1. North Mile

The Refuge manages approximately five miles of beach referred to as the "North Mile" which is closed to visitors and acts as a buffer between the high-use area of Little Island City Park and the Refuge. The "North Mile" is also designated as part of the Atlantic Coast Piping Plover Recovery Plan. Refuge piping plover use occurs during the spring and fall migrations. Only four to five piping plovers are usually recorded during this time. Nesting has not yet occurred on Refuge beaches, probably because of the lack of suitable nesting areas. Refuge biological staff conducts periodic shorebird surveys and is alert to Piping plover nesting possibilities and what to do in the event a nest is found.

In 1996, a revision was made to the original 1988 Atlantic Coast Piping Plover Recovery Plan (USFWS 1996). The primary objective of the revised recovery program is to remove the piping plover population from the List of Endangered and Threatened Wildlife and Plants. The plan hopes to do this by: (1) achieving well-distributed increases in numbers and productivity of breeding pairs, and (2) providing for long-term protection of breeding and wintering Plovers and their habitat. The strategies within the plan provide for the ensured long-term viability of piping plover populations in the wild. There are a total of 20 piping plover potential breeding sites in the state of Virginia. For this reason the "north-mile" will continue to remain closed to all public access, including fishing (See Appendix H Map 2).



Headquarters Ocean Front

2. North Mile Southern Boundary to False Cape State Park

With the exception of the "North Mile," the Refuge's oceanfront beach has always been open for recreational surf fishing during daylight hours. Special access regulations in 50 CFR govern public access and use of the Refuge, including surf fishing. All anglers, unless otherwise exempted, must hold a saltwater fishing license issued by the Virginia Marine Resource Commission. Access to the oceanfront for fishing is by foot or bicycle only. Vehicle access onto the beach for fishing is prohibited. Access to the oceanfront beach is limited to the Seaside and Dune Trails. Entry onto the dunes is prohibited. Under this plan the Refuge oceanfront beach will remain open for surf fishing from half an hour before sunrise to half an hour after sunset. However, nighttime surf fishing will not be allowed unless and until the Refuge's current access regulations as expressed in 50 CFR 26.34(n) are changed.

VIII. BAY—PROPOSED FISHING FACILITIES

A. Beggar's Bridge

This site is located off Muddy Creek road in the Pungo area of Virginia Beach. The current site has an undeveloped parking turn out and a degraded concrete launch ramp. It has traditionally been used primarily by local residents for launching jet skis, small fishing boats, canoes, and kayaks. Working cooperatively with the City of Virginia Beach, the proposal for this site is to provide upgraded parking for 8 to 10 people and construct a canoe/kayak launch ramp (See Appendix H Map 4).

B. Lotus Pond/Hell's Point Creek

This site has traditionally been used primarily by local residents and tourists for launching john boats, small fishing boats, canoes, and kayaks. Working cooperatively with the City of Virginia Beach, the proposal for this site is to upgrade the existing parking off the road for 8 to 10 people and construct a canoe/kayak launch ramp (See Appendix H Map 5).

C. Crystal Lake

This dredge pond was once mined for sand and gravel. Crystal Lake is located on the northeastern part of the Sandbridge community. Traditionally, locals have used this site for recreation, such as fishing, swimming, canoeing, and kayaking. This aquatic resource presents opportunity for eventual public use, including fishing. It will, however, remain closed to public use until public access, parking, existing trespass, and security issues can be addressed. Future management actions should include public involvement and outreach, access easements, and/or realty acquisition to assist in resolving these issues (See Appendix H Map 6).

D. Other Sites – Future Acquisitions

As land parcels are acquired through the Refuge's realty acquisition program, they will be evaluated for potential public fishing opportunities. A determination of such use of any parcel will be based upon the Services compatibility process. This plan will be amended as necessary to reflect the opening of any new public fishing sites.

IX. OCEANFRONT—PROPOSED NIGHT SURF FISHING

By law, National Wildlife Refuges are normally closed to public entry after dark, except by special use permit. In the summer of 2006, the Refuge received a request from a group of avid saltwater anglers to open the Refuge oceanfront to night fishing for the October red drum migration. A subsequent public comment meeting on this issue, held in February 2007, determined that there was considerable support for Refuge night surf fishing.

The Refuge proposes to open the designated area of oceanfront for public night surf fishing annually during the month of October, excluding the annual hunt dates. Night surf fishing will not be allowed unless and until the Refuge's current access regulation (50 CFR 26.34(n)) is changed. After the access regulations are changed, night surf fishing will be permitted daily from one half hour after sunset until midnight. The designated area for night surf fishing is between the Seaside and Dune Trails, a distance of approximately a quarter mile (See Appendix H Map 7).

The night-time surf fishing activity will be controlled through conditions listed on a required individual Special Use Permit (SUP) with enforcement by Refuge staff (See Appendix II

for sample permit and permit stipulations). Each individual will purchase a permit for night fishing and produce it upon request when participating in this use. For safety purposes, only individuals 16 years of age and older can obtain a permit. Applicants under 18 shall have a legal parent or guardian apply for and sign the SUP. Participants shall adhere to the following safety precautions when night fishing on the Refuge beachfront:

- All fishing rods, holders, and associated lines shall be placed as close to the ocean as possible and not allowed to run across the beach to be potentially snagged by passing vehicles. Rod holders shall be placed in the "wet sand" tidal zone only.
- All equipment shall be marked with either reflective tape or be placed within 5-10 feet of a light source, such as a lantern.
- Fisherman shall wear bright clothing to aid in visibility. If possible this should include reflective materials.
- Fishing equipment shall not be placed in a fashion so as to obstruct the operation of motor vehicles permitted on the beach. When driving, both high and low tracks are used by vehicles, and low track is preferable to reduce the possibility of becoming stuck. This is especially important on the approaches to the vehicle access ramp. 50 CFR 26.34 requires beach traffic to use the portion of the beach between the high and low tide marks.
- Fishermen shall be clear of the access ramp to allow vehicles to access the beach and to allow drivers to determine the best means to avoid interaction with the fishermen.
- Fishermen shall not be on the vehicle access ramp, especially near the outlet onto the beach. This is a blind spot that is difficult to stop short on to avoid pedestrians or vehicles. Stopping for pedestrians increases the potential for vehicles becoming stuck in the soft sand.
- All permitted drivers shall be provided notice of these requirements on their SUP.
- Permittees of the Motor Vehicle Access Permit Program shall have priority use on the beach.

X. FISHING EDUCATION

The U.S. Fish and Wildlife Service and Back Bay National Wildlife Refuge promote fishing as a viable wildlife-oriented recreational activity. The Refuge annually hosts a minimum of two "Family Fishing Day" events to promote fishing as a wholesome outdoor recreation opportunity and educate the public regarding fisheries management and conservation. Other partners who participate in this educational event are the Izaak Walton League, Virginia Game and Inland Fisheries, Wal-mart, Bass Pro, and Virginia Coastal Access Now. These events provide an opportunity for fishing novices, especially children, to learn how to fish, learn about nature, instill a sense of stewardship, and provide an introduction to the Refuge system mission and purpose. Additionally, the Refuge budgets approximately $1,000 annually for the purchase of event supplies, volunteer expenses, and fishing education brochures, coloring books, and other fishing education material. One event is in the spring as a part of National

Fishing Week, and the second event is held in September. The Refuge promotes catch and release as a part of its fishing program. The Service fishing education program also supports the Service's "Lets Go Outside" program.

XI. AVAILABILITY OF RESOURCES

A. Permitting the general fishing use is within the resources available to administer our Visitor Services Program. The funding received by the Refuge is adequate to continue to administer this program and to ensure that the use remains compatible with the Refuge purposes. The use of the area specified for fishing is a small area, where cost effective administration of the program can occur. Compliance with fishing regulations is handled within the regular duties of the Station Law Enforcement Officer.

B. Anticipated additional costs for special fishing events:

- Senior Refuge Biologist (GS-12) and/or GS-09 Refuge Biologist (review request) - 1/2 day/yr. = $175
- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist (coordinate with entity process) - 2 days/yr. = $650
- Refuge Manager (GS-14) (review and approval) - 1/4 day/yr. = $104
- Law Enforcement Officer (GS-09) (enforcement patrols) - 1 day/yr. = $208

Implementing the night-time surf fishing requires additional resources, due to being highly managed. Back Bay NWR incurs the bulk of the cost in staff time to administer the use each day; however, this cost (included below) will be offset by each $35 special use permit fee generated by this program. Costs associated with administering night-time surf fishing include:

- Visitor Services Manager (GS-12) and/or GS-09 Refuge Operations Specialist - 4 weeks/yr. $6,400
- Deputy Refuge Manager (GS-13) - 3 days/yr. = $1,125
- Refuge Manager (GS-14) – 3 days/yr. = $1,254
- Law Enforcement Officer (GS-09) - 4 weeks/yr. $4,200
- Administrative Assistant (GS-06) - 1 week/yr. = $900

XII. ASSESSMENT

A. Compatibility Policy

Federal law and Service policy provide the direction and planning framework to protect the Refuge System from incompatible or harmful human activities and ensure that Americans can enjoy Refuge System lands and waters. The Refuge Improvement Act is the key legislation regarding management of public uses and compatibility. The compatibility requirements of the Refuge Improvement Act were adopted in the USFWS Final Compatibility Regulations and Final Compatibility Policy, published October 18, 2000 (Federal Register, Vol. 65, No. 202, pp. 62458 to 62496). This Compatibility Rule changed or modified Service regulations contained in Chapter 50, Parts 25, 26, and 29 of the Code of Federal Regulations (USFWS 2000). The compatibility determinations for Back Bay Refuge can be found in Appendix A of the CCP along with additional information on the process. To view the policy and regulations online, visit http://policy.fws.gov/library/00fr62483.pdf.

B. Wildlife-Dependent Recreation Policy

The Improvement Act defines and establishes that compatible wildlife dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) are the priority general public uses of the Refuge System and will receive enhanced and priority consideration in refuge planning and management over other general public uses. The Wildlife Dependent Recreation Policy explains how we will provide visitors with opportunities for those priority public uses on units of the Refuge System and how we will facilitate these uses. We are incorporating Part 605, Chapters 1 to 7, of the Fish and Wildlife Service Manual into this plan.

C. Maintaining Biological Integrity, Diversity, and Environmental Health Policy

This policy provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources found in Refuge ecosystems. Refuge managers are provided with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and restore lost or severely degraded environmental components. Guidelines are also provided for dealing with external threats to the biological integrity, diversity, and environmental health of a Refuge and its ecosystem (601 FW 3).

D. Dune Habitat Protection

Beach and dune habitats will be managed for wildlife that depend upon these areas, with a focus on limiting public access to protect these fragile habitats. The stability and integrity of ocean-front primary and secondary sand dunes should be insured by maintaining the existing

dune and high beach profiles in as pristine a condition as possible. Reducing disturbances to dunes and beach from vehicular and human traffic shall be part of this policy.

E. Threatened and Endangered Species

Back Bay NWR has less than five miles of Atlantic coast beach habitat. The Refuge partners with False Cape State Park, which owns another five miles of beach habitat, to monitor loggerhead sea turtle nesting activity. In most years, loggerhead sea turtles nest on these beaches and produce over 100 young from each nest. Refuge and Park staff implement Loggerhead and Sea Turtle Recovery Plan strategies by protecting beach nesting habitats and enhancing hatching success.

The loggerhead sea turtle season is from late May through early September. This Recovery Plan describes the actions necessary to ensure the survival and recovery of loggerhead sea turtles (National Marine Fisheries Service & USFWS 1991).
The primary goal of the Plan is to contribute to the delisting of the turtle from its threatened status. The Back Bay NWR recreational fishing program will not negatively impact the Recovery Plan, nor materially interfere with other Refuge purposes or objectives. It will help meet the Refuge objective to provide wildlife-oriented recreational opportunities to the public.

As a part of the Refuge's CCP, a Section 7 intra-service threatened and endangered species review has been completed.



Literature Cited

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991. Recovery Plan for U.S. Population of Loggerhead Turtle. National Marine Fisheries Service, Washington, D.C.

Norman, M. D. 1990. Description of the study area. Pages 4-6 in Marshall, H. G. and M. D. Norman, eds. Proc. of the Back Bay Ecological Symposium. Old Dominion Univ., Norfolk.

U.S. Fish and Wildlife Service. 1993. Back Bay NWR Station Management Plan.

U.S. Fish and Wildlife Service. 1996. Piping Plover (*Haradrius melodus*) Atlantic Coast Population, Revised Recovery Plan. Hadley, Massachusetts. Accessed at: *http://www.blm.gov/wildlife/pl_44sum.htm.* 81 pp. (Draft)

U.S. Fish and Wildlife Service. 2000. Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997. Federal Register/Vol. 65, No. 202

Appendix I.

Maps

Map 1: Overview of Back Bay NWR Recreational Fishing Resources

Map 2: D-Pool, Head Quarters Bulkhead, and Oceanfront

Map 3: Horn Point Canoe/Kayak Launch and Proposed Fishing Pier

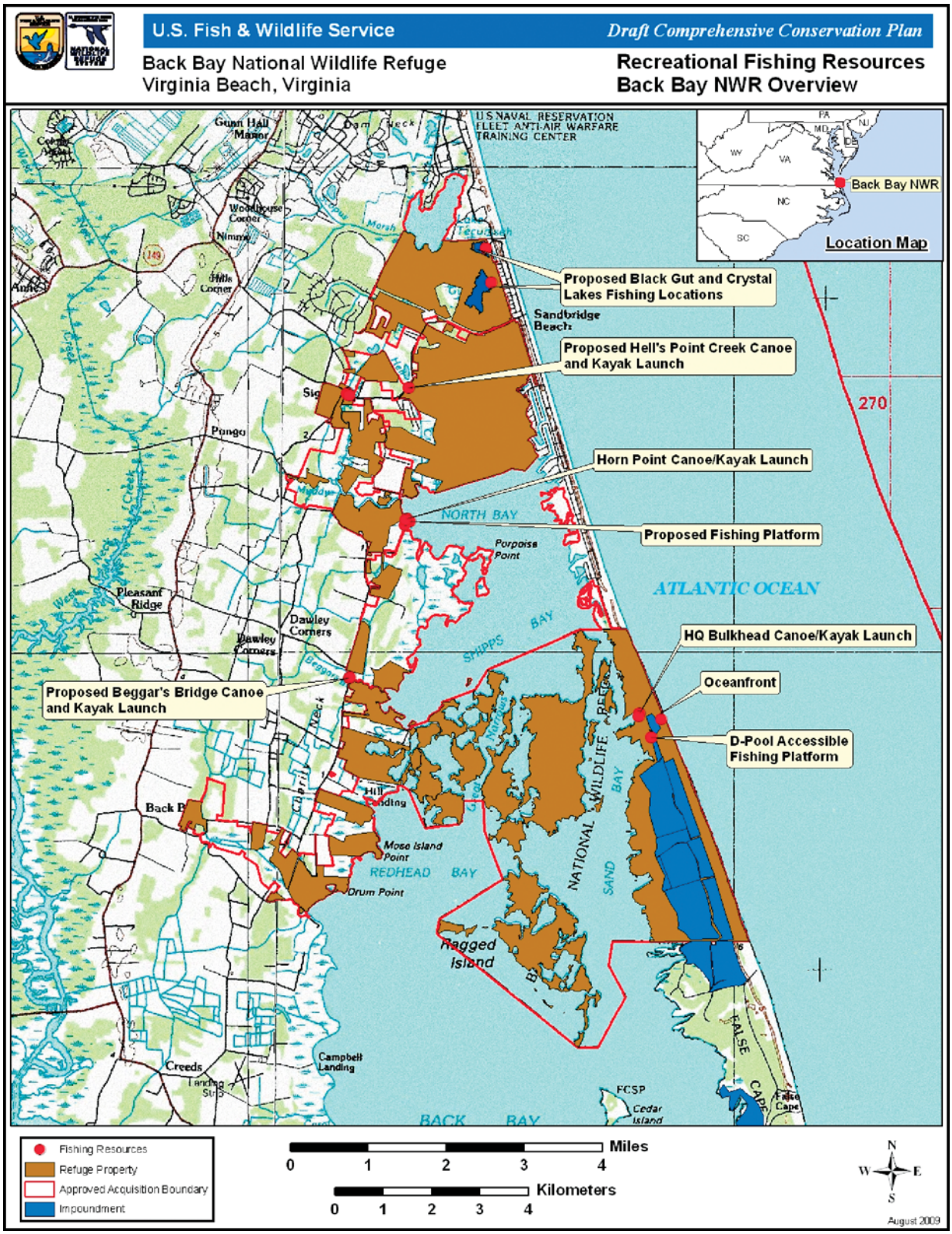
Map 4: Proposed Beggar's Bridge Canoe/Kayak Launch

Map 5: Proposed Lotus Pond/Hell's Point Creek

Map 6: Crystal Lake and Black Gut

Map 7: Proposed Night Surf Fishing Area

Map H-1: Overview of Back Bay NWR Recreational Fishing Resources



Map H-2: D-Pool, Headquarters Bulkhead, and Oceanfront



Map H-3: Horn Point Canoe/Kayak Launch and Proposed Fishing Pier



Map H-4: Proposed Beggar's Bridge Canoe/Kayak Launch



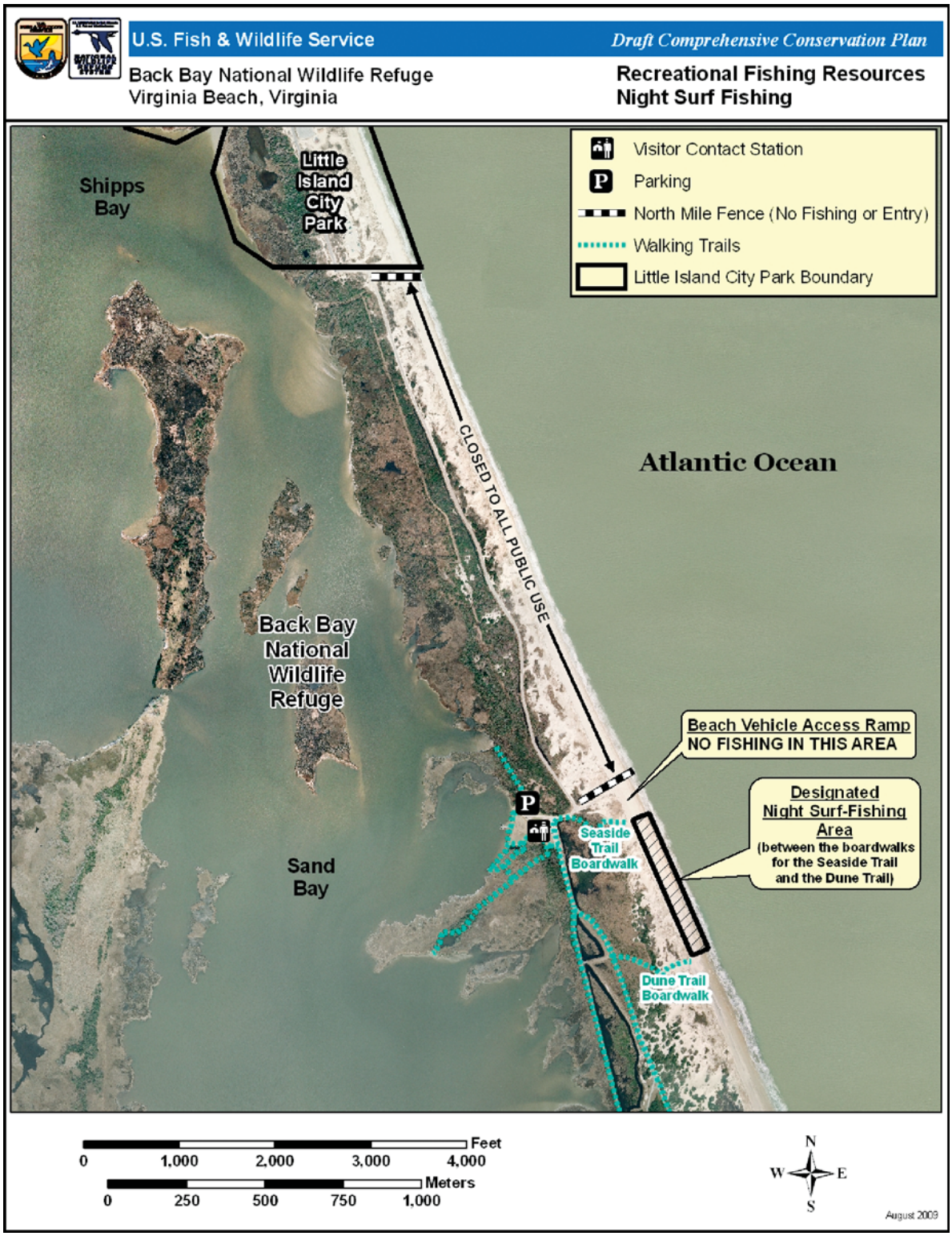
Map H-5: Proposed Lotus Pond/Hell's Point Creek



Map H-6: Crystal Lake and Black Gut



Map H-7: Proposed Night Surf Fishing Area



Appendix II.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

BACK BAY National Wildlife Refuge

SPECIAL USE PERMIT

Station No. to be Credited	Permit Number
51510	BKB-NF07-042

Date

Period of Use (inclusive)
From OCTOBER 1 , 2007
To OCTOBER 31 , 2007

Permittee Name

Permittee Address

Purpose (specify in detail privilege requested, or units of products involved)

THE ABOVE NAMED INDIVIDUAL IS PERMITTED TO ENTER BACK BAY NATIONAL WILDLIFE REFUGE TO NIGHT SURF FISH ALONG THE DESIGNATED SECTION OF REFUGE OCEANFRONT FROM ONE HALF HOUR AFTER SUNSET UNTIL 12:00 A.M., PER THE ATTACHED MAP AND STIPULATIONS. PERMITTEE MUST BE ON THE REFUGE PRIOR TO ENTRANCE GATE CLOSURE AT DUSK. THIS PERMIT IS FOR THE ABOVE NAMED INDIVIDUAL ONLY, DOES NOT ALLOW FOR GUESTS , AND IS NON-TRANSFERABLE. PERMITTEE MUST BE OFF THE REFUGE BY 12:30 A.M.
FOR PUBLIC SAFETY REASONS, ALL ACCESS AND ALL FISHING ACTIVITY IS PROHIBITED ON REFUGE HUNT DATES AS FOLLOWS:
12:30 A.M., SATURDAY, OCTOBER 6, 2007 THROUGH 6:00 A.M. THURSDAY, OCTOBER 11, 2007
12:30 A.M., THURSDAY, OCTOBER 25, 2007 THROUGH 6:00 A.M. SUNDAY, OCTOBER 28, 2007

Description (specify unit numbers; metes and bounds, or other recognizable designations)
THE DESIGNATED NIGHT SURF FISHING AREA IS BETWEEN THE SEASIDE BOARDWALK TRAIL AND THE DUNE BOARDWALK TRAIL (SEE ATTACHED MAP).

Amount of fee $ 35.00 if not a fixed payment, specify rate and unit of charge:

- ☐ Payment Exempt -Justification:
- ☒ Full Payment
- ☐ Partial Payment -Balance of payments to be made as follows:

Record of Payments

Special Conditions
SEE ATTACHED MAP AND STIPULATIONS.
ALL PERMIT APPLICANTS MUST PRESENT PROPER PHOTO IDENTIFICATION AND A VALID VIRGINIA STATE SALTWATER FISHING LICENSE, OR PROOF OF EXEMPTION FROM SAME, PRIOR TO PERMIT ISSUANCE. SUCH IDENTIFYING INFORMATION, ALONG WITH THIS PERMIT, MUST BE IN THE PERMITTEE'S POSSESSION WHILE SURF FISHING ON THE REFUGE.

This permit is issued by the U.S. Fish and Wildlife Service and accepted by the undersigned, subject to the terms, covenants, obligations, and reservations, expressed or implied herein, and to the conditions and requirements appearing on the reverse side.

Permittee Signature

Issuing Officer Signature and Title
Jared Brandwein, Refuge Manager

Form 3-1383 (Rev. 6/85)

This form was electronically produced by Elite Federal Forms, Inc.

Night Surf Fishing Special Use Permit with Permit Stipulations

General Conditions

1. *Payments*

All payments shall be made on or before the due date to the local representative of the U.S. Fish and Wildlife Service by a postal money order or check made payable to the U.S. Fish and Wildlife Service.

2. *Use limitations*

The permittee's use of the described premises is limited to the purposes herein specified; does not unless provided for in this permit allow him/her to restrict other authorized entry on to his/her area; and permits to the Service to carry on whatever activities are necessary for (1) protection and maintenance of the premises and adjacent lands administered by the Service and (2) the management of wildlife and fish using the premises and

3. *Damages*

The United States shall not be responsible for any loss or damages to property including but not limited to growing crops, animals, and machinery; or injury to the permittee, or his/her relatives, or to the officers, agents, employees, or any others who are on the premises from instructions or by the sufferance of the permittee or his/her associates; or for damages or interference caused by wildlife or employees or representatives of the Government carrying out their official responsibilities. The permittee agrees to save the United States or any of its agencies harmless from any and all claims for damages or losses that may arise or be incident to the flooding of the premises resulting from any associated Government river and harbor, flood control, reclamation, or Tennessee Valley Authority activity.

4. *Operating Rules and Laws*

The permittee shall keep the premises in a neat and orderly condition at all times, and shall comply with all municipal, county, and State laws applicable to the operations under the permit as well as all Federal laws, rules, and regulations governing National Wildlife Refuges and the area described in this permit. The permittee shall comply with all instructions applicable to this permit issued by the refuge officer in charge. The permittee shall take all reasonable precautions to prevent the escape of fires and to suppress fires and shall render all reasonable assistance in the suppression of refuge fires.

5. *Responsibility of Permittee*

The permittee, by operating on the premises, shall be considered to have accepted these premises with all the facilities, fixtures, or improvements in their existing condition as of the date of this permit. At the end of the period specified or upon earlier termination, the permittee shall give up the premises in as good order and condition as when received except for reasonable wear, tear, or damage occurring without fault or negligence. The permittee will fully repay the Service for any and all damage directly or indirectly resulting from negligence or failure on his/her part, or the part of anyone of his/her associates, to use reasonable care.

6. *Revocation Policy*

This permit may be revoked by the Regional Director of the Service without notice for noncompliance with the terms hereof or for violation of general and/or specific laws or regulations governing National Wildlife Refuges or for nonuse. It is at all times subject to discretionary revocation by the Director of the Service. Upon such revocation the Service, by and through any authorized representative, may take possession of the said premises for its own and sole use, or may enter and possess the premises as the agent of the permittee and for his/her account.

7. *Compliance*

Failure of the Service to insist upon a strict compliance with any of this permit's terms, conditions, and requirements shall not constitute a waiver or be considered as a giving up of the Service's right to thereafter enforce any of the permit's terms, conditions, or requirements.

8. *Termination Policy*

At the termination of this permit, the permittee shall immediately give up possession to the Service representative, reserving, however, the rights specified in paragraph 9. If he/she fails to do so, he/she will pay the Government, as liquidated damages, an amount double the rate specified in this permit for the entire time possession is withheld. Upon yielding possession, the permittee will still be allowed the reenter as needed to remove his/her property as stated in paragraph 9. The acceptance of any fee for liquidated damages or any other act of administration relating to the continued tenancy is not to be considered as an affirmance of the permittees action nor shall it operate as a waiver of the Government's rights to terminate or cancel the permit for the breach of any specified condition or

9. *Removal of Permittee's Property*

Upon the expiration or termination of this permit, if all rental charges and/or damage claims due to the Government have been paid, the permittee may within a reasonable period as stated in the permit or as determined by the refuge officer in charge but not to exceed 60 days, remove all structures, machinery, and/or other equipment, etc., from the premises for which he/she is responsible. Within the period the permittee must also remove any other of his/her property including his/her acknowledged share of products or crops grown, cut, harvested, stored, or stacked on the premises. Upon failure to remove any of the above items within the aforesaid period, they shall become the property of the United States.

10. *Transfer of Privileges*

This permit is not transferable, and no privileges herein mentioned may be sublet or made available to any person or interest not mentioned in this permit. No interest hereunder may accrue though lien or be transferred to a third party without the approval of the Regional Director of the U.S. Fish and Wildlife Service and the permit shall not be used for speculative purposes.

11. *Conditions of Permit not Fulfilled*

If the permittee fails to fulfill any of the conditions and requirements set forth herein, all money paid under this permit shall be retained by the Government to be used to satisfy as much of the permittee's obligation as possible.

12. *Official Barred from Participating*

No Member of Congress or Residential Commissioner shall participate in any part of this contract or to any benefit that may arise from it, but this provision shall not pertain to this contract if made with a corporation for its general benefit.

13. *Nondiscrimination in Employment*

The permittee agrees to be bound by the equal opportunity clause of Executive Order 11246, as amended.

Privacy Act Statement--Special Use Permit

NOTICE: In accordance with the Privacy Act of 1974, 5 U.S.C. 552a, please be advised that:

1. The issuance of a permit and collection of fees on lands of the National Wildlife Refuge System is authorized by the National Wildlife Refuge System Administration Act (16 U.S.C. 668dd - 668ee), and the Refuge Recreation Act, (16 U.S.C. 460k-3); implemented by regulations in 50 CFR 25-36.
2. Information collected in issuing a permit may be used to evaluate and conclude the eligibility of, or merely document, permit applicants.
3. Routine use disclosures may also be made (1) to the U.S. Department of Justice when related to litigation or anticipated litigation; (2) of information indicating a violation or potential violation of a statute, regulation, rule, order or license, to appropriate Federal, State, local or foreign agencies responsible for investigating or prosecuting the violation or for enforcing or implementing the statute, rule, regulation, order or license; (3) from the record of the individual in response to an inquiry from a Congressional office made at the request of that individual; (4) to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor, or to consumer reporting agencies to prepare a commercial credit report for use by the Department (48FR 54716; December 6, 1983).
4. Any information requested is required to receive this permit. Failure to answer questions may jeopardize the eligibility of individuals to receive permits.

BACK BAY NATIONAL WILDLIFE REFUGE

NIGHT SURF FISHING PERMIT STIPULATIONS

1. PERMIT: This permit must be in the possession of the permittee at all times while on the Refuge after dusk. This permit is valid for the person to whom it was issued only. No guests are permitted by this permit, and this permit is non-transferable. The accompanying vehicle hang tag issued with this permit must be prominently displayed on the permittee's vehicle rear view mirror, with the permit number visible when looking through the windshield from the outside.

2. ACCESS: Permittees must be on the Refuge by dusk, prior to the closing of the Refuge's automatic entrance gate. Parking for night surf fishing is permitted in the visitor parking lot, or the employee parking area, both located adjacent to the Refuge headquarters building. Parking in any other area is prohibited. Access to and from the designated night fishing area is via the Seaside Boardwalk Trail, directly across from the Refuge's Visitor Contact Station. The permittee is prohibited from using the Refuge's vehicle access ramp for egress to and from the beach, and must keep clear a minimum of a 100 foot circumference surrounding the vehicle access ramp approach. Beach vehicle permittees do use the ramp and beach after dark, and those fishing should position there gear so as not to impede this authorized beach traffic.

3. REGULATIONS: The following are prohibited while night surf fishing at Back Bay National Wildlife Refuge:
(a) Dogs or other pets, including pets left in vehicles
(b) Alcohol consumption
(c) Camping or sleeping
(d) Firearms, fireworks, or campfires
(e) Entry into the dunes
(f) Vehicles parked outside of the designated night fishing parking area
(g) Access to any other area of the Refuge, other than that designated for night fishing activity and associated parking. Permit is not valid on city, state, or private lands.
(h) Refuge access and/or night fishing by anyone under the age of 16
(i) Swimming, surfing, or sunbathing, including the use of associated beach recreation equipment, such as boogie boards, snorkeling and scuba gear.
(j) Harming, disturbing, or taking of any wildlife, natural resource or cultural resource. Any fish taken are subject to all state and federal licensing and regulatory requirements regarding species, size, creel limits, etc.

4. EQUIPMENT: All permittees must be actively fishing while on the Refuge, with the appropriate fishing equipment. There is a limit of 3 fishing poles per person on the beach. All fishing rods, holders, and lines must remain wholly within the tidal "wet" area, as close to the ocean as possible, at all times, in order to avoid conflict with any passing beach vehicle permittees. All poles and equipment will be marked with reflective paint or tape, or be placed within 10 feet of a portable light source, such as a lantern. Those fishing shall wear reflective fishing vests, hats, and/or reflective arm bands for night visibility. No spear guns, arrowed bows, cross bows, trap lines, or gill nets of any type are permitted. All equipment is subject to inspection.

5. SANITATION: No trash receptacles are provided on the beach. Those fishing are required to pack out their trash, and dispose of it in a proper trash receptacle. A portable restroom is located adjacent to the Visitor Contact Station. There is no fish cleaning station on the Refuge. Fish cleaned and/or filleted on the beach should have their entrails packed out, or disposed of back into the ocean. Do not leave fish entrails on the beach or in Refuge trash receptacles.

6. All other state, federal, and refuge regulations apply. This permit is subject to revocation for violation of any terms stated herein, and violators may be subject to further legal action.

Appendix III.

Freshwater and Saltwater Species of Back Bay NWR

Longnose Gar	*Lepisosteus osseus*
Bowfin	*Amia calva*
Ladyfish	*Elops saurus*
American Eel	*Anguilla rostrata*
Bay Anchovy	*Anchoa mitchilli*
Gizzard Shad	*Dorosoma cepedianum*
Threadfin Shad	*Dorosoma petenense*
Atlantic Menhaden	*Brevoortia tyrannus*
American Shad	*Alosa sapidissima*
Blueback Herring	*Alosa aestivalis*
Alewife	*Alosa pseudorharengus*
Lake Chubsucker	*Erimyzon sucetta*
Common Carp	*Cyprinus carpio*
Golden Shiner	*Notemigonus crysoleucas*
Sheepshead Minnow	*Cyprinodon variegatus*
Grey Trout	*Cynoscion regalis*
Black Bullhead	*Ameiurus melas*
Brown Bullhead	*Ictalurus nebulosus*
Yellow Bullhead	*Ameiurus natalis*
Channel Catfish	*lctalurus punctatus*
White Catfish	*Ameiurus catus*
Tadpole Madtom	*Noturus gyrinus*
Eastern mudminnow	*Umbra pygmaea*
Chain Pickerel	*Esox niger*
Redfin Pickerel	*Esox americans*
Atlantic Needlefish	*Strongylura marina*
Banded Killifish	*Fundulus diaphanus*
Marsh Killifish	*Fundulus confluentus*
Mummichog	*Fundulus heteroclitus*
Mosquitofish	*Gambusia affinis*
Tidewater Silverside	*Menidia menidia*
Threespine Stickleback	*Gasterosteus aculeatus*
Northern Pipefish	*Syngnathus fuscus*
Striped Mullet	*Mugil cephalus*
White Mullet	*Mugil curema*

Atlantic Croaker	*Micropogon undulatus*
Spotted Seatrout	*Cynoscion nebulosus*
Spot	*Leiotomus xanthurus*
Naked Goby	*Gobiosoma bosc*
White Perch	*Roccus lineatus*
Striped Bass	*Morone saxatilis*
Silver Perch	*Bairdiella chrysura*
Spotted Bass	*Micropterus punctulatus*
Yellow Perch	*Perca flavescens*
Flier	*Centrarchus macropterus*
Largemouth Bass	*Micropterus salmoides*
Black Crappie	*Pomoxis nigromaculatus*
Bluespotted Sunfish	*Enneacanthus gloriosus*
Warmouth	*Lepomis gulosus*
Redear Sunfish	*Lepomis microlophus*
Bluegill	*Lepomis macrochirus*
Pumpkinseed	*Lepomis gibbosus*
Blackcheek Tonguefish	*Symphurus plagiusa*
Hogchoker	*Trinectes maculatus*
Summer Flounder	*Paralichthys dentatus*
Southern Flounder	*Paralichthys lethostigma*

Appendix I



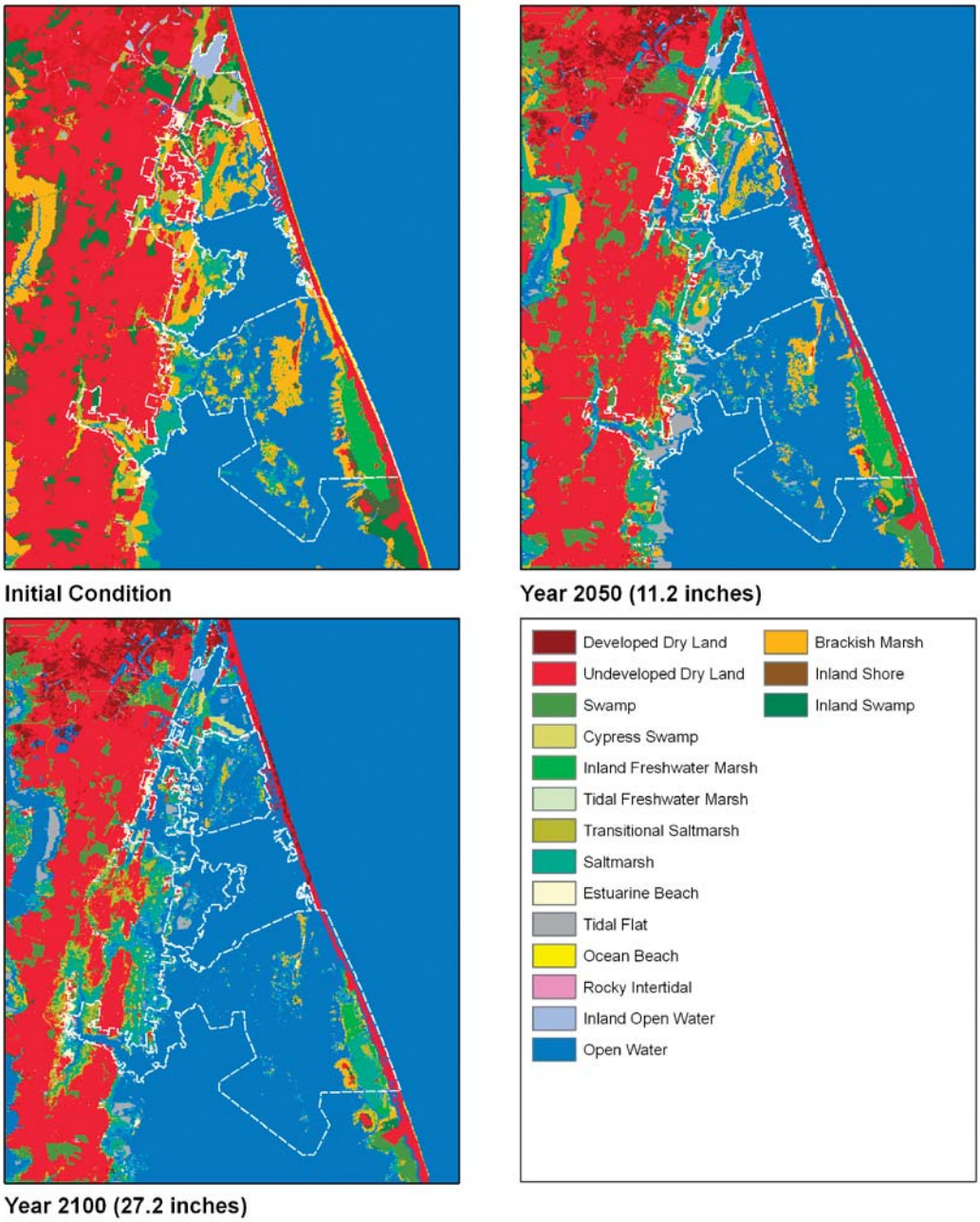
USFWS

Daily sea turtle patrols search for this—a sea turtle crawl. Will it lead to a nest or not?

Back Bay National Wildlife Refuge SLAMM Analysis Report

Back Bay National Wildlife Refuge
SLAMM Analysis Report

In 2008, the National Wildlife Federation (NWF) analyzed the projected habitat effects of sea-level rise in Chesapeake Bay using a model called "SLAMM" (Sea Level Affecting Marshes Model). At the request of the Conservation Biology Program, National Wildlife Refuge System, NWF parsed out data and maps for several refuges. This document provides the maps and data for Back Bay National Wildlife Refuge.

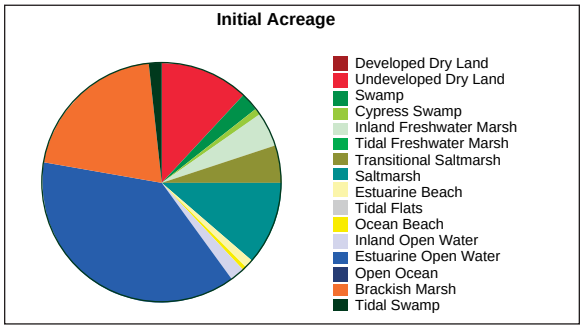


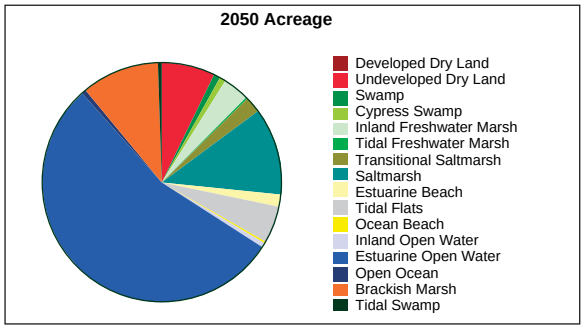
Backbay National Wildlife Refuge

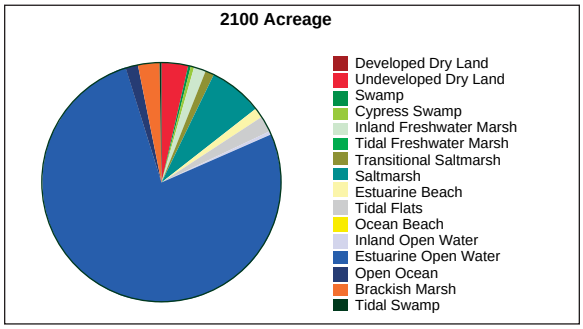
Back Bay National Wildlife Refuge, SLAMM Analysis Data

SLAMM Code	Initial Acreage	2050 Acreage	2100 Acreage	Initial Percent	2050 Percent	2100 Percent
Developed Dry Land	2.42	2.78	2.50	0.01	0.02	0.02
Undeveloped Dry Land	1957.43	1184.77	585.29	12.04	7.29	3.60
Swamp	410.90	124.27	24.76	2.53	0.76	0.15
Cypress Swamp	128.47	127.05	124.90	0.79	0.78	0.77
Inland Freshwater Marsh	731.74	615.69	267.93	4.50	3.79	1.65
Tidal Freshwater Marsh	1.56	1.56	0.67	0.01	0.01	0.00
Transitional Saltmarsh	845.64	395.49	179.15	5.20	2.43	1.10
Saltmarsh	1840.14	1878.45	1185.17	11.32	11.55	7.29
Estuarine Beach	178.39	294.54	212.72	1.10	1.81	1.31
Tidal Flats	0.00	806.99	334.75	0.00	4.96	2.06
Ocean Beach	101.22	48.45	27.19	0.62	0.30	0.17
Inland Open Water	327.17	59.25	56.84	2.01	0.36	0.35
Estuarine Open Water	6108.97	8833.75	12511.55	37.57	54.33	76.95
Open Ocean	15.12	93.15	247.75	0.09	0.57	1.52
Brackish Marsh	3354.88	1703.36	472.53	20.63	10.48	2.91
Tidal Swamp	255.82	90.32	26.14	1.57	0.56	0.16
Total	**16259.85**	**16259.85**	**16259.85**	**100.00**	**100.00**	**100.00**

Pie Chart Analysis – Legend Identical to Map Legend







Acknowledgements. Patty Glick, Global Warming Specialist, National Wildlife Federation, Seattle; Brad Nunley, GIS Specialist, National Wildlife Federation, Atlanta.

For more information: Brian Czech, Conservation Biologist, U.S. Fish and Wildlife Service, National Wildlife Refuge System, 4401 N. Fairfax Drive, MS 670, Arlington, VA, 22203, 703-358-2485, *brian_czech@fws.gov.* For SLAMM methods and specifications see: *http://www.nwf.org/sealevelrise/pdfs/SeaLevelRiseandCoastalHabitats_ChesapeakeRegion.pdf*

Appendix J



USFWS

Farmhouse on Bay Bay National Wildlife Refuge

National Historic Preservation Act Consultation

COMMONWEALTH of VIRGINIA

Douglas W. Domenech
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

April 12, 2010

Mr. Thomas Bonetti, Senior Refuge Planner
U.S. Fish and Wildlife Service - National Wildlife Refuge System
300 Westgate Center Drive
Hadley, MA 01035

Re: *Back Bay National Wildlife Refuge Draft Comprehensive Conservation Plan (CCP) and Environmental Assessment (EA)*
Virginia Beach, Virginia
DHR File No. 2010-0604; DEQ #10-054F

Dear Mr. Bonetti:

We have received for review the document referenced above. The CCP and EA recognize the presence of historic and prehistoric resources with the Back Bay NWR and the potential for significant submerged resources in the immediate vicinity. Although an archaeological assessment of the NWR was conducted in the 1980s, this effort did not include comprehensive survey nor does it consider the archaeological potential of newly-acquired property.

It is essential that the USFWS consider the conservation and management of cultural resources along with the other important resources within the NWR. Potential impacts to historic properties from the proposed headquarters, re-alignment of New Bridge Road, and other development must be carefully considered and assessed in consultation with our office. It should be noted that all activities of a type that could impact historic properties if present must be coordinated with our office as there is no agreement between our agencies excluding any undertakings from review. The CCP and EA recognize this responsibility and DHR concurs with the plan presented in Chapter 2, pp. 2-3 – 2-4.

Finally, given the presence of archaeological sites associated with the Native American occupation of the area, the USFWS has a responsibility to identify and consult any Indian tribes with an interest in the area. The Virginia Council on Indians should also be invited to review and comment on this document. We look forward to working with the USFWS in the preservation of Virginia's natural and cultural heritage. If you have any questions, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
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Appendix K



USFWS

Visitors ride on tram while viewing the refuge.

Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for the Back Bay National Wildlife Refuge

- **Public Involvement Summary**
- **List of Preparers**

Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for the Back Bay National Wildlife Refuge

Introduction

In March 2010, we completed the "Back Bay National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment" (Draft CCP/EA). That draft refuge plan outlines three alternatives for managing the refuge over the next 15 years, and identifies Alternative B as the "Service-preferred Alternative." We released the draft plan for 33 days of public review and comment from March 30 to May 1, 2010.

We evaluated all the letters and e-mails sent to us during that comment period, along with comments recorded in our two public meetings. This document summarizes those comments and provides our responses to them. Based on our analysis in the Draft CCP/EA, and our evaluation of comments, we modified Alternative B, and recommended it to our Regional Director for implementation. It is that modified Alternative B which is detailed in this CCP. Our modifications include additions, corrections, or clarifications of our preferred management actions. We have also determined that none of those modifications warrants our publishing a revised or amended draft CCP/EA before publishing the CCP.

These are some important changes we made.

1. We have no objections to the concept of the Lago Mar to Sandbridge Trail (the route of which is not yet specifically defined or mapped but would primarily be a City of Virginia Beach project along their right-of-way), but the refuge cannot make a determination until we complete a NEPA analysis. The analysis will occur after we receive the City of Virginia Beach's plan, which should include details on developing a trailhead and spur from the proposed new Refuge Visitor Center to the Lago Mar portion of the trail. We have included a map of the City's proposed trail near Sandbridge Road that was not included in the draft CCP/EA.

2. We inserted language recognizing the important partnership we have with state agencies and the need to follow required state regulations during construction of new facilities.

3. We clarified with much greater detail the goals, objectives, strategies and rationale of the refuge management direction, especially in terms of habitat management.

4. We corrected all format and typographical errors that were brought to our attention.

Our Regional Director will either select our modified Alternative B for implementation, or one of the other two alternatives analyzed in the Draft CCP/EA, or a combination of actions from among the three alternatives. He will also determine whether a Finding of No Significant Impact (FONSI) is justified prior to finalizing his decision. He will make his decision after:

- Reviewing all the comments received on the Draft CCP/EA, and our response to those comments; and,

- Affirming that the CCP actions support the purpose and need for the CCP, the purposes for which the refuge was established, help fulfill the mission of the Refuge System, comply with all legal and policy mandates, and work best toward achieving the refuge's vision and goals.

Concurrent with release of the approved CCP, we are publishing a notice of the availability in the Federal Register. That notice will complete the planning phase of the CCP process, and we can begin its implementation phase.

Summary of Comments Received

Given our interest in an objective analysis of the comments we received, we enlisted the U.S. Forest Service's Recreation Solutions Enterprise Team (FS) in compiling a database that would identify and code specific issues and concerns. That team has particular expertise in providing unbiased analyses of public comments on major proposals by federal land management agencies, a process called "content analysis". The team evaluated and coded all of the comments we received, including all letters, e-mails, and comments recorded at public meetings. Our responses below follow the subject headings in their coding structure.

During the comment period, 162 letters were received representing 174 individual signatures. A total of 90 individual comments were assessed during the content analysis process. Additionally, public meetings were held in Virginia Beach on April 13, 2010 (Three Oaks Elementary School) and April 14, 2010 (Ashville Bridge Creek Environmental Education Center).

We received a consolidated letter compiled by the Virginia Department of Environmental Quality which included comments from nine local and state agencies listed below. We either refer to that letter herein as the "VA DEQ" letter, or refer to respective agency comments.

- Virginia Department of Environmental Quality (VA DEQ)
- Virginia Department of Agriculture and Consumer Services
- Virginia Department of Conservation and Recreation (VA DCR)
- Virginia Department of Health (VA DH)
- Virginia Marine Resources Commission (MRC)
- Virginia Department of Historic Resources (VA DHR)
- Virginia Department of Forestry (VA DOF)
- City of Virginia Beach (City)
- Hampton Roads Planning District Commission

The Virginia Department of Game and Inland Fisheries also submitted a separate letter.

In the discussions below, we address every substantive comment received. Occasionally, the FS would code the same comment under two or more subject headings. In our responses, we may refer the reader to other places in this document where we address the same comment. Directly beneath each subject heading, you will see a list of unique letter ID numbers that correspond to the person, agency or organization that submitted the comment. The cross-referenced list appears at the end of this appendix. A large majority of the letters received commented on the transportation system of roads and trails, specifically support for expansion of a trail system from Lago Mar to Sandbridge. A petition was also signed to expand the rustic trail system adjacent to the Lago Mar neighborhood. Multiple members of the following groups submitted comments: Virginia Beach Advisory Committee on Bikeways and Trails, Lago Mar Civic League Members, Back Bay Restoration Foundation, and the Tidewater Appalachian Trail Club

In several instances, we refer to specific text in the Draft CCP/EA, and indicate how the CCP was changed in response to comments. You have several options for obtaining the full version of either the Draft CCP/EA or the CCP. They are available online at http://www.fws.gov/northeast/planning/Back_Bay/ccphome.html. For a CD-ROM or a print copy, contact the refuge headquarters.

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Email: northeastplanning@fws.gov

Service Responses to Comments by Subject

Planning and Public Involvement

Comment Period (Letter ID#: 11)

One respondent would like the comment period extended.

We did not officially extend the comment period with a public notification, but did accept all comments for an additional week (to May 10, 2010).

Document (Clarity, Technical, Editorial, Availability) (Letter ID#: 59, 74)

On page 1-20, 3rd paragraph, ownership of the bay needs clarification. The bottom of the bay is owned by the Commonwealth of Virginia and the man-made canals are within the Refuge boundary and owned by the Refuge.

For the most part, the bay bottom is owned by the Commonwealth. Some man-made canal bottoms were owned by the Refuge as a result of our land acquisition program. The Refuge conducted a land exchange with the City of Virginia Beach to transfer Refuge owned canal bottoms to the City, where conflicts with private upland landowners could be addressed with less problems.

In Chapter 1, the reference and Website to Virginia's Comprehensive Wildlife Conservation Plan need to be updated to "Virginia's Wildlife Action Plan" and http://bewildvirginia.org.

These corrections have been made in the final CCP.

In Chapter 2, the Draft CCP references Virginia State Conservation Officers. This should state VDGIF's Conservation Police Officers.

This correction has been made in the final CCP.

Request for Information or Meeting (Letter ID#: 64, 68, 73)

One respondent requested a hard copy of the draft plan be sent to three different individuals. The Virginia Department of Game and Inland Fisheries requested a Web address for reviewing an electronic version of the CCP/EA and would like to know the process for submitting comments. Another respondent offered to volunteer at Back Bay National Wildlife Refuge.

Hard (paper) copies of the draft plan were sent to all persons requesting. The state agencies were provided a web address to view the document, as well as copies on CD and printed versions. Information about the Refuge's volunteer program and associated opportunities was mailed to the requester.

The City of Virginia Beach requested the Service to advertise and conduct a public information meeting to inform the general public of the project scope, schedule and potential impacts once the document is finalized.

No public meetings are required at this stage of the planning process, and no meetings are currently scheduled.

Alternatives

Alternative B: Enhanced Habitat Diversity and Visitor Opportunities (Service-preferred Alternative) (Letter ID#: 2, 68, 73, 74)

Several respondents prefer the Service-preferred Alternative (B) over Alternatives A and C. One local resident supports the effort outlined in Alternative B to establish a new HQ/Administration building on a relocated section of New Bridge Road. Support is also voiced for developing new hiking and canoe/kayak trails under Alternative B. One commenter noted some difficulty in grasping some of the proposed refuge management practices under Alternatives B and C, but supported the refuge's stated mission and the refuge staff's efforts to carry it out.

The City of Virginia Beach agrees that Alternative B "is the best alternative for future development, habitat restoration and environmental protection purposes. It best balances the needs for wildlife, habitat and public use of the Refuge. Furthermore, the preferred alternative affords the City and the Refuge a strong opportunity to continue and enhance the tremendous arrangement that the City and the Service had."

We clarify with much greater detail the goals, objectives, strategies and rationale of the refuge management direction in the final CCP (Chapter 4, Management Direction and Implementation - Goals, Objectives and Strategies). We appreciate the support for our recommended alternative.

Refuge Physical, Natural and Biological Resources
Refuge Administration

Partnerships (Including Volunteers) (Letter ID#: 74)

One commenter supports increased opportunities for volunteer involvement and educational events both on and off the Refuge, as outlined in Goal 7 of the Draft CCP/EA.

We appreciate the support for our recommended alternative.

Visitor Services (Letter ID#: 56, 74)

One respondent supports outreach education and visitor services, but questions the plan to expand

visitor facilities when the "Rightmeirer house is about to come on line."

> *The Service has recently made structural repairs and energy-efficient improvements to a former residence (Rightmier House) on refuge property along Sandbridge Road under the American Recovery and Reinvestment Act. The refuge will move its administrative offices into the rehabilitated in-town facility in 2010 to better service the community. The primary purpose of the building is to serve as office space for refuge staff. However, there remain some difficulties with access and parking on the site, making it less suitable for visitors and public use than the proposed headquarters and visitor center that would be developed across the street at Tract #244.*

Interagency Coordination (Letter ID#: 73, 74)

The Virginia Department of Environmental Quality (VA DEQ) stated that prior to implementation of any planned construction activities, the Service is required to submit a federal consistency determination (FCD) to the VA DEQ, and comments extensively on the regulatory and coordination requirements of implementing the CCP. Much of what is referenced involves meeting local and state regulatory requirements and obtaining the correct permits before developing new facilities.

> *We will adhere to all applicable permit rules and regulations required for national wildlife refuges, and to insure full compliance with the Coastal Zone Management Act and federal consistency regulations implementing the Act. There were other management recommendations in the VA DEQ letter which we discuss under each respective subject heading below. Most of those recommendations are added to our CCP as strategies.*

The Virginia Department of Game and Inland Fisheries (VA DGIF) offer assistance in determining likely impacts upon fish and wildlife resources and habitats.

> *We will include the following recommendation as a strategy for protecting fish and wildlife in Chapter 4 (Management Direction and Implementation - Goals, Objectives and Strategies): "We will continue to work closely with VA DGIF to develop specific wildlife and fisheries management strategies, protect listed species and valuable resources, and manage hunting and fishing programs" (Goal 7, Objective 7a).*

Solid and Hazardous Waste Management (Letter ID#: 73)

State and local agencies commenting on the CCP state that all solid waste, hazardous waste and hazardous materials must be managed in accordance with all applicable federal, state and local environmental regulations, when implementing the CCP.

The VA DEQ Waste Division commented that only solid waste issues were addressed in the report, although a GIS database search did not reveal any waste sites within a half-mile radius that would impact or be impacted by the subject site. A cursory review of its data files listed several solid waste sites located within the project zip code, but VA DEQ is unsure of the project proximity of these sites.

The VA DEQ commented that all structures being demolished should be checked for asbestos-containing materials and lead-based paint prior to demolition. If found, federal and state regulations must be followed. They also encourage construction projects and facilities to implement pollution prevention principles. If petroleum-contaminated soils are generated during construction, they must be characterized and disposed of properly.

The VA DEQ and City of Virginia Beach commented on the sewage system discussed on page 4-27 of the CCP, and requested the Service ensure compliance with the Sewage Collection and Treatment (SCAT) Regulations. Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

We include these recommendations in the CCP. They have been added to Chapter 4, Management Direction and Implementation.

Air Quality (Letter ID#: 73)

The VA DEQ and City of Virginia Beach request that during construction activities, all state and local regulations and coordination requirements are followed to restrict the emissions of VOCs and NOx. They specifically mention asphalt paving operations, fugitive dust and emissions control, and open burning activities.

We will adhere to all requirements for permits and consultations that apply to national wildlife refuges. In addition, we will include the following strategies for minimizing fugitive dust during construction in the CCP in Chapter 4 (Management Direction and Implementation - Goals, Objectives and Strategies):

- *Use, where possible, water for dust control*
- *Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials*
- *Covering of open equipment for conveying materials*
- *Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.*

Water Resources (Letter ID#: 73)

The Virginia Department of Health, Office of Drinking Water noted that construction projects may include support infrastructure such as the use of septic systems or potable water; however, it does not state whether the potable water would originate from a well or public water supply system. They also stated, “no groundwater wells are within a 1–mile radius and no surface water intakes are located within a 5-mile radius of the project site. The project does not fall within Zone 1 or Zone 2 of any public surface water sources. There are no apparent impacts to public drinking water sources due to this project.”

The VA DEQ also recommends that the FWS consider water conservation measures, such as native landscaping and low-flow toilets when implementing construction projects.

We will adhere to all requirements for permits and consultations that apply to national wildlife refuges. In addition, we will include the following recommendations for protecting water resources as strategies in CCP Chapter 4, (Management Direction and Implementation - Goals, Objectives and Strategies):

- *Grounds should be landscaped with hardy native plant species to conserve water as well as minimize the need to use fertilizers and pesticides.*
- *Convert turf to low water-use landscaping such as drought resistant grass, plants, shrubs and trees.*
- *Low-flow toilets should be installed in new facilities.*
- *Consider installing low-flow restrictors/aerators to faucets.*
- *Improve irrigation practices by upgrading with a sprinkler clock; watering at night, if possible, to reduce evapotranspiration; installing a rain shutoff device; and collecting rainwater with a rain bucket or cistern system with drip lines.*
- *Consider replacement of old equipment with new high-efficiency machines to reduce water usage by 30-50 percent per use.*
- *Check for and repair leaks (toilets and faucets) during routine maintenance activities.*

Wetlands (Letter ID#: 73)

The VA DEQ Tidewater Regional Office (TRO) states "that the vast majority of activities proposed under Alternatives B and C are related to the management or enhancement of wetland areas in a manner that would not normally require regulatory authorization. However, it is possible that some of these activities would require review through DEQ's permitting program. The VPDES permitting section states that the permits under its jurisdiction would not apply to the project." The Service should seek compliance early in the process and prior to initiating impacts to surface waters and wetlands to ensure that necessary permits are obtained in advance.

The VA DEQ additionally recommends that stream and wetland impacts be avoided to the maximum extent practicable when implementing construction activities.

We will adhere to all requirements for permits and consultations that apply to national wildlife refuges. In addition, we will include the following recommendations for protecting wetlands as strategies in CCP Chapter 4:

- *Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable.*

- *Preserve the top 12 inches of material removed from wetlands for use as wetland seed and root-stock in the excavated area.*
- *Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.*
- *Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub or forested). The applicant should take all appropriate measures to promote re-vegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.*
- *Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats or geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.*
- *All non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading or filling activities should be clearly flagged or marked for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.*
- *Measures should be employed to prevent spills of fuels or lubricants into state waters.*
- *Maintain undisturbed wooded buffers of at least 100 feet in width around all onsite wetlands and on both sides of all perennial and intermittent streams.*

Subaqueous Lands (Letter ID#: 73)

The Virginia Marine Resources Commission (VMRC) commented that they regulate encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia state law. The Service should contact VMRC when planning for construction projects or prior to exploring or recovering underwater historic artifacts, to ensure compliance.

We will adhere to all requirements for permits and consultations that apply to national wildlife refuges.

Soils

Erosion and Sediment (Letter ID#: 73)
The VA DEQ commented that when implementation of construction occurs, the "FWS and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R) and Virginia Stormwater Management Law and Regulations. . . Additionally, the FWS must prepare and implement an erosion and sediment control plan to ensure compliance with state law and regulations."

We will adhere to all requirements for permits and consultations that apply to national wildlife refuges. Prior to implementation, erosion and sedimentation controls would be designed in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. These controls would be in place prior to clearing and grading, and maintained in good working order to minimize impacts to state waters. The controls would remain in place until the area is stabilized.

Vegetation (Letter ID#: 73)

A comment was received regarding Back Bay National Wildlife Refuge being a Virginia state conservation site, as classified by Virginia's Department of Conservation and Recreation (DCR). According to this classification, the site has very high biodiversity significance.

The DCR recommends maintaining freshwater pool habitats and restoring natural maritime upland and wetland communities, including allowing some of the impoundments to revert to scrub-shrub wetlands. The DCR also recommends contacting the agency regarding updated information if a significant amount of time passes before the CCP is enacted, and the agency recommends avoiding the documented natural heritage resources within the Refuge.

We appreciate this suggestion, and recognize that increased biodiversity is related to continued maintenance of our freshwater impoundment complex. In 2008, our adaptive management approach resulted in the same conclusion that Virginia DCR suggests. Refuge biological staff regularly analyze the productivity of our freshwater impoundments. The Refuge concluded that one impoundment (G-Pool) had consistently failed to meet the goals and objectives that it was constructed and actively managed for. These goals and objectives revolved around consistent use by migratory waterfowl (ducks, geese or Tundra swans) during the spring/fall migrations and winter; use by shorebirds (sandpipers, dowitchers, plovers, etc.) during their spring and/or fall migrations; and use by wading birds (herons, egrets, ibis, etc.) throughout the year. G-Pool has consistently registered very little to no use by these migratory waterbirds. The G-Pool vicinity had previously been a back-dune, shrub-scrub habitat. Such habitat is now known to support high use by migratory landbirds during their spring and fall migrations, as well as during their nesting season. As a result, G-Pool is now being managed with a new goal of permitting shrub and forb regrowth that will encourage use

by migrating and nesting landbird species. It will no longer be actively managed for migratory waterbirds. Should other impoundments also fail to meet our freshwater impoundment goals and objectives, they may also be converted to a similar management regime.

Forests (Letter ID#: 73, 74)

Two state agencies commented on the forest resources of the Refuge. The Virginia Department of Forestry found "no significant impact to the forest resources of the Commonwealth" in the CCP. However, the Virginia Department of Game and Inland Fisheries cautioned against using green ash in the preferred alternative when enhancing and preserving the native woodlands. The agency cites the recent destruction of these trees in Northern Virginia by the non-native emerald ash borer as a reason for concern. The comment says that although the emerald ash borer is unlikely to spread, it is recommended to consult with the Virginia Department of Forestry to develop an alternate species.

Some planting of Green ash (along with oaks, tupelos and Bald cypress) has already occurred on parts of the Refuge. The Service will monitor newly planted Green ash trees for signs of the non-native beetle, and will immediately consult with the Virginia Department of Forestry if any Emerald ash borers are found.

Agricultural Lands (Letter ID#: 73)

One comment was received regarding agricultural lands on the Refuge. The Virginia Department of Agriculture and Consumer Services (VDACS) noted that approximately 100 acres of cropland would be allowed to naturally convert to shrub-scrub habitat. The commenter encourages the "FWS to minimize the transfer of agricultural land to non-agricultural purposes in the development of this project."

The decline in farmlands in Virginia is particularly troubling to us when the land is sold for development or otherwise results in habitat loss. Service policy (601 FW 3 Biological Integrity, Diversity and Environmental Health) states that "We do not allow refuge uses or management practices that result in the maintenance of non-native plant communities unless we determine that there is no feasible alternative for accomplishing refuge purpose(s). For example, where we do not require farming to accomplish refuge purpose(s), we cease farming and strive to restore natural habitats." The Refuge Manager has determined that farming is not required to achieve Refuge purposes, and lands formerly in agriculture can be restored to create more benefits for wildlife than when farmed. We believe that we have taken a phased, measured approach to eliminating farming so we can appropriately restore these lands to natural habitats.

Invasive Plant Species (Letter ID#: 74)

One commenter recommended clarification in the document regarding invasive plants. They recommended "monitoring invasive plants, such as *Vitex rotundifolia*, which are present near the

Refuge border and which may spread onto the Refuge under suitable conditions."

We will include the above recommendation as an additional strategy for protecting fish and wildlife in Chapter 4 (Management Direction and Implementation - Goals, Objectives and Strategies) and further study the implications of controlling Muscadine grape (Vitis rotundifolia). However, it is our understanding that this wild grape is a native species that provides wildlife food and songbird nesting habitat as well as a very good wine for human consumption. We will research this further.

Wildlife (Letter ID#: 73, 74)

Virginia's Department of Game and Inland Fisheries had a several comments about wildlife management. The DGIF noted that they are the regulatory agency over fish and wildlife matters in the Commonwealth of Virginia and is a consulting agency under the U.S. Fish and Wildlife Coordination Act.

The DGIF supports Goal 1 of the preferred alternative. In addition to the strategies outlined, they recommend more measures to control the population of feral hogs, noting the ecological damage caused by hogs. They recommend supplementing hunting with trapping in order to control hog populations. Furthermore, the DGIF plans to have feral hog management guidelines completed this summer for Service review.

Finally, the DGIF comments on Goal 4, noting that the Refuge supports "a number of listed species as well as a myriad of other resident and migratory species." They concur that "habitat restoration, invasive species removal and control, and continued monitoring of wildlife support the mission of the Refuge and the Commonwealth's wildlife." They also encourage continued inter-agency cooperation, offering turbidity research that may be useful to the Service.

We will include the following recommendation as a strategy for protecting fish and wildlife in Chapter 4 (Management Direction and Implementation - Goals, Objectives and Strategies): "We will continue to work closely with VA DGIF to develop specific wildlife and fisheries management strategies, protect listed species and valuable resources, and manage hunting and fishing programs" (Goal 7, Objective 7a).

With regards to trapping feral pigs, we concur with the recommendations of VA DGIF as long as they do not conflict with the primary purpose for which the Refuge was established. The past 20 years of Refuge hunting strategies do not appear to be significantly reducing our feral pig population, and the Service agrees that a long term, more successful tool is needed. VA DGIF has provided several traps that will be used to further reduce the local feral hog population later this year and into the future. Refuge biological staff are working closely with the local US Department of Agriculture's Wildlife Assistance Division and VA DCR's False Cape State Park in determining when during 2010 to begin such trapping.
We appreciate the continued support and partnership of the VA DGIF, and welcome their offer

to assist with turbidity research that may be useful to the Service. Strategies under Goal 1 in the final CCP (Chapter 4) will now read as:

- *Within 2 years, develop partnerships with Virginia Department of Environmental Quality, Virginia Department of Game and Inland Fisheries and local agencies (e.g., Back Bay Restoration Foundation) to collect water quality data that would result in a scientifically sound water quality database for Back Bay and its tributaries. Data from this database would be used to provide the Refuge with sound baseline data for existing Back Bay water quality standards.*
- *Within 5 years, establish an effective and scientifically-sound, interagency water quality monitoring program within the Back Bay watershed to establish sound baseline water quality data, and insure that negative impacts to Back Bay's water quality are detected as soon as possible.*

Migratory Birds (Letter ID#: 59, 74)

A couple of comments were received relating to migratory birds. One commenter noted the benefits that native American lotus has for "waterfowl such as wood duck and teal feeding on the seeds produced in the fall." They noted that this has been widely published in Virginia Wildlife, Southern Living, and other publications.

Although American lotus is a native species, and a potential food for waterfowl, it can also cause some problems if allowed to spread and become a monoculture. Despite its ornamental qualities, the aquatic flower's large circular leaves can eliminate underwater and above water plant and animal diversity by covering and shading the water's surface, thus excluding the critically needed sunlight from reaching the underwater substrate. These substrates harbor the diverse seed-banks that provide plant diversity, which in turn feeds and provides for increased animal diversity.

Virginia's Department of Game and Inland Fisheries supported additional strategies laid out in Goal 3 to preserve beach and dunes and protect migratory birds and other wildlife habitat. They support the proposal not to grant additional permits to traverse Refuge beaches to access property and support close monitoring of sea turtle nesting.

Threatened and Endangered Species (Letter ID#: 73, 74)

A couple of state agencies commented about threatened and endangered species. The DGIF noted that though the bald eagle is mentioned a number of times in the document, the document fails to state that it is a State threatened species, protected under Virginia's Endangered Species Act.

We regret this oversight. The clarification that the bald eagle is a State threatened species will be in the final CCP.

The Department of Conservation and Recreation's Division of Natural Heritage noted that the Refuge is located within the Back Bay Conservation Site, a highly significant biodiversity site. They recommend avoidance of documented natural heritage resources within the Refuge.

> *We will work with the Department of Conservation and Recreation's Division of Natural Heritage to avoid documented natural heritage resources within the Refuge.*

Historic/Cultural Resources (Letter ID#: 73)

Virginia's Department of Historic Resources (DHR) submitted several comments regarding historic and prehistoric resources. They state that DHR is the state regulatory agency that ensures compliance with the National Historic Preservation Act (NHPA).

Further comments from the agency include proper procedures for complying with the NHPA. They state that permits for exploration and recovery of shipwrecks, which may be substantial in number, must be permitted by VMRC. They also add that the Service should coordinate with DHR in shipwreck reporting and study if the Service is carrying out an action "which may affect a submerged resource."

DHR concurs with the Service on the plan (Chapter 2, pages 2-3 to 2-4) to preserve cultural resources on the Refuge with construction of the proposed headquarters, realignment of the New Bridge Road, and other developments. They add that the Virginia Council on Indians should be invited to review and comment on this document. Finally, they add that since there is no agreement between DHR and Service, any activity that could impact historic resources must be coordinated with DHR.

> *We received a letter on April 12, 2010 from Roger Kirchen, VA Department of Historic Resources after his review of the Draft CCP/EA. That letter is included as Appendix E. We will adhere to all requirements for permits and consultations that apply to national wildlife refuges, and comply with the NHPA. We will continue our consultation with VA DHR as we plan specific activities. The Draft CCP/EA was made available to all members of the public. The Virginia Council on Indians, the Delaware Tribe of Indians, and the Delaware Nation of Oklahoma were also invited to review and comment. None of the tribes commented.*

Local Economy/Socio-economics (Letter ID#: 33)

One letter expressed the belief that the Nimmo to Sandbridge Trail would help the local economy and well-being. It states that in addition to reducing emissions and increasing healthy lifestyles, the trail will bring more visitors to the area. This, in turn, would likely increase local retail sales.

> *The Nimmo (Lago Mar) to Sandbridge Trail proposal is being considered by the City of Virginia Beach as a part of their trails planning process. The Refuge has no objection to the trail concept, but will not make a determination until after receiving the City's plan and conducting a NEPA analysis.*

Property Value (Letter ID#: 6)
One letter stated that the multipurpose trail would improve the quality of life, thus increasing property value. The comment states that this would create more revenue for the city from property and lodging taxes.

> *We have no objection to the concept of the Lago Mar to Sandbridge Trail (the route of which is not yet specifically defined or mapped but would primarily be a City of Virginia Beach project along their right-of-way), but we cannot make a determination until we complete a NEPA analysis. We recognize that appropriate and compatible outdoor recreation facilities and opportunities significantly contribute to the quality of life. Many studies support the fact that eco-tourism can make a significant contribution to the local tax base.*

Public Access (Letter ID#: 60, 72, 74, 76)

Many letters commented on public access, and most are discussed under specific recreational activities. However, one commenter had a general comment, and other letters spoke to multiple activities or specific areas.

One commenter stated in general terms that they supported the proposed opportunities for increased recreation. However, they think it is also imperative to consider the logistics to avoid private property encroachment or compromising public health.

Another letter commented on multiple activities at specific locations of concern. They object to three proposed actions due to concern for their impact on the native American lotus. The objectionable actions are: "1 – Canoe/kayak launches on Sandbridge Road at Ashville Bridge Creek pg. H-27 (map H-5); 2 – Public fishing (Lotus/Hells Point Fishing locations) pg. H-27 & parking (map H-5); 3 – Hiking Trails (Tract 244, Sandbridge Road) goal 5 pg. 2-45". The commenter states that witnesses have seen canoes and kayaks cutting paths in the lotus and destroying them. Second, fishermen lose their monofilament line in the lotus, creating a hazard for herons and other wildlife. They add that there are visual effects from the line being entangled in overhead utility lines, shoreline bushes, and lotus. Finally, they state that the seeds produced by the lotus in the fall are beneficial to the wildlife. The commenter recommends that the existing Horn Point launch and proposed Sandbridge Road / Hell Point Canal launch "would be sufficient to provide adequate launches for the public for the geographical area."

> *We are also concerned about potential negative impacts of the fishing lines and hooks to waterfowl and wading birds, and will consider reducing fishing where lotus is common due to the entanglement and hook-trapping potential that those plants pose.*

A petition signed by multiple parties urged the recreational development of the Lago Mar Tract. The petition states the desire to see the old farm roads in the area open to public use. They would like to see more hiking trails "in the southern part of the city comparable to the trail system at First Landing State Park in the northern part of the city." They also state that local citizens would be willing to patrol the area.

We have no objection to the concept of the Lago Mar to Sandbridge Trail (the route of which is not yet specifically defined or mapped but would primarily be a City of Virginia Beach project along their right-of-way), but we cannot make a determination until we complete a NEPA analysis. The analysis will occur after we receive the City of Virginia Beach's plan, which should include details on developing a trailhead and spur from the proposed new Refuge Visitor Center to the Lago Mar portion of the trail. We have included a map of the City's proposed trail near Sandbridge Road that was not included in the draft CCP/EA. Further trail development within the Lago Mar Tract is not proposed within the scope of this plan, due to staffing, construction, maintenance, and potential trespass issues.

Finally, Virginia's Department of Game and Inland Fisheries supports the Refuge's "proposal to increase opportunities on the Refuge for visitors to participate in wildlife viewing and photography, educational and interpretive programs, and activities that facilitate appreciation of wildlife resources such as canoeing and kayaking." They add that the Refuge is a site on the Seashore to Cypress Loop, part of DGIF's Virginia Birding and Wildlife Trail. DGIF recommends that all new development adheres to best management practices, including low-impact designs and the use of permeable surfaces for trails, parking lots, and other hardened surfaces.

The Refuge cooperates with the City of Virginia Beach in many aspects of outdoor recreation development and management, particularly regarding low-impact public boating access to Back Bay. The Refuge incorporates best management practices and low-impact design and construction materials into all recreation facility development.

Hunting (Letter ID#: 1, 54, 56, 60, 67, 74)

Several letters were received about hunting from the general public. One state agency commented on hunting. Some letters were a general support for hunting or offered a contrary view that hunting is cruel. One letter recommended "deer hunting (perhaps bow) on the north end (north of Sandbridge Road) of the Refuge." Other letters pointed to hunting as the best economical tool to manage wildlife. Another letter voiced concerns over hunting of both deer and feral hogs and asked if the Service had considered "birth control or other solutions to the overpopulation."

The DGIF supported the expansion of hunting on the Refuge. They add that they can assist the Service in developing additional hunting and fishing programs on the Refuge, as needed.

Hunting is one of the six priority recreation uses supported by the National Wildlife Refuge System. It has been determined that managed hunting is an appropriate and compatible recreation opportunity at Back Bay National Wildlife Refuge, and is an important tool for managing white-tailed deer and feral hog populations on the Refuge. This plan proposes to increase deer hunting opportunity at key locations on the north and west side of the Refuge.

Studies have documented the fact that birth control for feral hogs and white-tailed deer is not a practicle option in the field, due to the serum expense, cost of application, and ineffectiveness of the method.

Fishing (Letter ID#: 59)

A couple of letters were received about fishing. One letter, documented in the general section of the public access report, raised concerns about monofilament line impacting visuals and wildlife. Another letter brought up similar issues, claiming that broken lines and hooks are especially a threat to wildlife and waterfowl in shallow impoundments and canals. The commenter requests that consideration and additional research is needed for the preferred alternative.

> *Fishing is a priority public use, and an appropriate outdoor recreation use within the National Wildlife Refuge System. Public fishing activity on the Refuge is regulated through the State of Virginia, Department of Game and Inland Fisheries for freshwater, and the Marine Resources Commission for recreational saltwater fishing. The Refuge provides public education materials on environmentally friendly fishing practices, and currently conducts two fishing education workshops annually. As stated earlier, we are also concerned about potential negative impacts of the fishing lines and hooks to waterfowl and wading birds, and will consider reducing fishing where lotus is common due to the entanglement and hook-trapping potential that those plants pose.*

The DGIF generally supports, and offers support for the Refuge's fishing programs. They support fishing access at Horn Point. However, they recommend that the structure be constructed as a fishing pier, which would allows "fishing parallel to the shoreline as opposed to a fishing platform which provides less space for anglers." They support continued nighttime fishing and recommend better access to Black Gut. They also recommend "development of an active management plan for the D-Pool, currently available for public fishing, which addresses the impoundment's poor fish population structure and water quality issues."

> *The Refuge plans for the Horn Point multi-use pier to be constructed with a parallel to shoreline design. The Refuge plans to add night surf fishing hours after revising access regulations. The Refuge's recreational fishing plan identifies Black Gut as a primitive recreational fishing opportunity/destination. The Refuge will cooperate with Virginia DGIF on developing a fishery management plan for D-Pool.*

Transportation (roads, trails) (Letter ID#: 3, 21, 22, 23, 56, 60, 68, 73)

Many letters commented on the transportation system, including both roads and trails. The majority of respondents supported the expansion of the trail system. A lot of comments were received in support of the trail from Lago Mar to Sandbridge, also adding the desire to have a multipurpose trail from the new welcome center to connect with the Lago Mar to Sandbridge Trail. A petition was signed to expand the rustic trail system adjacent to the Lago Mar neighborhood. Several commenters noted that a bike trail along the Sandbridge Trail would increase safety.

One commenter had concerns about the traffic congestion and safety issues related to parking areas for canoe and kayak trails, particularly at Hell's Point Creek and Asheville Bridge Creek on

Sandbridge Road. The commenter mentioned that car entering to and exiting from the road would create a dangerous situation on the winding road.

The City of Virginia Beach had several comments related to the transportation system. They comment that the recommended Nimmo Parkway Trail is not in the CCP and recommend contacting the City with regards to incorporating this trail into the document. The city comments that they assume the relocation of the New Bridge Road associated with the headquarter relocation will be funded by the Service. They would also like more information and a potential cooperative relationship with regards to the Interpretive Scenic Byway Improvements. The city suggests consistent naming of trails throughout the document. They also mention that several trails in the CCP are not in the Virginia Beach outdoor plan, though they do support the trails. Finally, they suggest that major road labels are shown on the map for orientation.

> *We have no objection to the concept of the Lago Mar to Sandbridge Trail (the route of which is not yet specifically defined or mapped but would primarily be a City of Virginia Beach project along their right-of-way) but we cannot make a determination until we complete a NEPA analysis. The analysis will occur after we receive the City of Virginia Beach's plan, which should include details on developing a trailhead and spur from the proposed new Refuge Visitor Center to the Lago Mar portion of the trail. The City is currently developing its comprehensive trials management plan. A funding source for the proposed relocation of New Bridge Road to accommodate the new Refuge headquarters and proposed new Visitor Center is yet to be identified. Once the City's draft comprehensive trails plan is completed, the Refuge will provide formal comment to their plan, and ensure close communication on trail development proposals where there is mutual interest.*

Lago Mar to Sandbridge Trail (Letter ID#: 4, 40, 41, 43, 68, 77)

A majority of the letters received about the transportation system were related to the proposed trail connecting Lago Mar and Sandbridge. All of the commenters supported the trail. Reasons for support included traffic safety, reduced emissions, recreation, and economics. Many commenters also requested a connectors trail to the new welcome center. On commenter was "strongly opposed to allowing horses on this trail."

> *We have no objection to the concept of the Lago Mar to Sandbridge Trail (the route of which is not yet specifically defined or mapped but would primarily be a City of Virginia Beach project along their right-of-way), but we cannot make a determination until we complete a NEPA analysis. The analysis will occur after we receive the City of Virginia Beach's plan, which should include details on developing a trailhead and spur from the proposed new Refuge Visitor Center to the Lago Mar portion of the trail.*

Safety (weapons) (Letter ID#: 59)

A commenter who lives adjacent to Tract #150 expressed concern over hunters ignoring private property boundaries. The commenter is concerned over stray bullets potentially causing harm, hunters not staying in their assigned zones, and ignoring no trespassing signs.

We abide by the current Code of Federal Regulations (50 CFR Part 32) regarding possession of firearms on refuge lands. Our hunt programs are designed to promote the safety of hunters and other visitors. Hunting is segregated from other uses on the refuge for visitor safety and to prevent visitor conflicts

.

Effective February 22, 2010, Section 512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009, P.L. 111-24, 123 Stat. 1764-65, allows persons to possess firearms while in units of the National Park and National Wildlife Refuge Systems if they are in compliance with applicable Federal and State law.

Boating (Letter ID#: 59, 60, 68, 161)

Several comments were received regarding boating, including one comment from the City of Virginia Beach. There was some concern over safety issues and impacts from watercraft. One commenter noted that there has been increased jet ski use during the spring and summer, posing a safety risk to other users of Back Bay. Another comment stated that the proposed use of Ashville Bridge Creek should be abandoned due to safety reasons. They state that the location is on a curve and the mix of cars, parking, and people with canoes and kayaks is an accident waiting to happen. Another comment notes that if foot bridges are installed, they should be installed at a level to safely permit sailing crafts to pass underneath.

Back Bay National Wildlife Refuge has no jurisdiction over boating in the Bay, which includes jet ski use. We will assure safety through design, or we will not construct.

The Refuge supports low-impact boating access, such as canoeing and kayaking, on Back Bay, but has no jurisdiction to control recreational boating access on the bay. The Refuge does not permit trailers in any of its parking/launching areas, which assists in mitigating the impact of power water craft use on the bay. The Refuge distributes a cooperatively produced recreational boating brochure for Back Bay, which addresses the environmental sensitivity of this water body. There are also two interpretive signs, with a similar message, located at the Refuge headquarters canoe/kayak launch, and at the Horn Point canoe/kayak launch. The proposal for additional launch facilities and parking at Asheville Bridge Creek would include working with the City of Virginia Beach on safety improvements for Sandbridge Road at that location. The Refuge does not own the Lotus Garden/Pond property, but will work cooperatively with the City of Virginia Beach to manage safety and provide for natural resource protection at this and other locations.

Other comments raise the concern about impacts that canoes and kayaks have on the native American lotus. Specific locations mentioned where the letters said the lotus would be negatively impacted are Tabernacle Creek and Asheville Bridge Creek.

Refuge biologists have determined that the abundance and hardiness of the American lotus in Ashville Bridge and Tabernacle Creeks can easily withstand kayak passages and leaf damage caused by passing kayakers, as damaged or destroyed leaves and flowers are quickly replaced by its extensive root systems.

The City of Virginia Beach expressed support for the Lotus Garden Canoe/Kayak Launch Facility, Lovett's Landing Canoe/Kayak Launch Cooperative Project, and Hell's Point Creek Canoe/Kayak Launch.

> *The Refuge does not own the Lotus Garden/Pond property, but will work cooperatively with the City of Virginia Beach to manage safety and provide for natural resource protection at this and other locations.*

Letter ID Numbers and Respondents

Letter Number	Name	Organization
1	Jerry Smith	
2	Bruce Drees	
3	R. Paul Fisher	
4	John D. Hendrickson	
5	Terry Ann Stevens	
6	Mike Sanson	
7	Steve and Kelly Rose	
8	John Carvalho	
9	Hugh Barton	
10	Todd and Sharon Poulos	
11	Al Henley	
12	Paul Dockery	
13	Carrie Dayball	
14	Wayne Benson	
15	David Cho	
16	Christine Warfel	
17	Ruth O'Lill	
18	Liz Romero-Kibiloski	
19	Anne Gassett	
20	Jane Collier	
21	Wayne Wilcox	Virginia Beach Parks & Recreation
22	Kate Button	
23	John Carvalho	
24	Kathleen Sarraino	
25	David Masters	
26	Mary Beth Husing	
27	Paul Husing	
28	Sharon Bivens	
29	Raymond Leach	
30	JoAnne Evangelista	
31	Lisa Conway	
32	Tim McDonald	
33	Chris Stellato	
34	Krystal Heffley	
35	Josh Sloan	
36	Katie Hutchins	
37	Victoria Stellato	
38	Bob Kern	
39	Teresa Cox	
40	Lynn Graybill	
41	April Alton	
42	Tausha Magrum	
43	William Brown	
44	Brandi Lewis	
45	Maggie Irby	
46	Robert Misfeldt	
47	Sharon Holstrom	

Public Involvement Summary

Effective conservation usually begins with effective community involvement. To ensure that our future management of the Refuge considers the issues, concerns, and opportunities expressed by the public, we used a variety of public involvement techniques in our planning process.

Public scoping. Open houses and public information meetings were held throughout the Virginia Beach area at three different locations during January of 2002. Meetings were advertised locally through news releases, paid advertisements, and through our mailing list. For each meeting, the "open house" session was planned where people could informally learn of the project, and have their questions or concerns addressed in a "one-on-one" situation. The evening public information meeting sessions usually included a presentation of the Refuge, 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. The public meetings allowed us to gather information and ideas from local residents, adjacent landowners, and various organizations and agencies.

Newsletters. An "Issues Workbook" was developed to encourage written comments on topics such as wildlife habitats, non-native nuisance species, and public access to the Refuge. In January 2002, these workbooks were mailed to a diverse group of over 1,500 people on our mailing list, given to people who attended a public meeting, and distributed to anyone who requested one. The workbook included questions to help collect ideas, concerns and suggestions from the public on important issues associated with managing the Refuge. We asked for input on issues and possible action options, the things people valued most about the Refuge, their vision for the future, and whether our recreational facilities meet public needs. We received more than 100 workbooks in response. In January 2007, we distributed a "planning newsletter." In this newsletter, we shared the Refuge vision statement and goals and summarized our three management alternatives. In April 2010 we distributed an additional "planning newsletter" to announce the release of our draft CCP/EA and public meetings to request comments.

"Federal Register" Notices. We published our original Notice of Intent (NOI) in the "Federal Register" on May 8, 2002, stating we would develop an Environmental Impact Statement (EIS) for the Refuge in conjunction with its CCP. Then, as we evaluated the primary issues, the Service determined that an EA would be a more appropriate document than an EIS to accompany the CCP. The need to prepare an EIS is a matter of professional judgment requiring consideration of all issues in question. If the EA determines that the CCP will constitute a major Federal action significantly affecting the quality of the human environment, an EIS will then be prepared. The primary purpose of an EIS is to ensure that a full and fair discussion of all significant environmental impacts occurs and to inform decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. On February 23, 2007, our second NOI in the "Federal Register" advised the public we were withdrawing the previous notice and, instead of completing a CCP/EIS, would complete a CCP/EA. In preparing the draft CCP/EA, we considered all comments we had received after publishing the first NOI. A Notice of Availability (NOA) was published on March XX, 2010 for the release of the draft CCP/EA and public comments were received until May 1, 2010.

Workshops. The rationale of our workshops was to generate a range of possible solutions that would address issues of resource management and public use at the Refuge. From 2002 through 2007, we held workshops with various biological and

public use experts from Federal, state, local and non-profit organizations. Those workshops allowed us to work closely with our partners in discussing the vision, goals, objectives, strategies, and consequences at the heart of this plan.

Contact Information

The input we obtained from our public meetings, newsletters and workshops has been used to prepare this draft CCP/EA. The draft CCP/EA was released for released for 30 days of public review and comment. During that period, two additional public meetings were held to give the public additional opportunities to comment.

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List of Preparers

Core Planning Team

Kyle Barbour

Title	Park Manager
Affiliation	False Cape State Park (Virginia Department of Conservation and Recreation, Division of State Parks)
Experience	18 years with Virginia Department of Conservation and Recreation, Division of State Parks

Gary Costanzo

Title	Migratory Game Bird Manager
Affiliation	Virginia Department of Game and Inland Fisheries
Experience	17 years with Virginia Department of Game and Inland Fisheries (12 years as Waterfowl Project Leader, and 5 years as Migratory Game Bird Manager)

Thomas Bonetti

Title	Senior Refuge Planner and Planning Team Leader
Affiliation	USFWS Region 5 Regional Office
Experience	1.5 years with California Department of Parks and Recreation; 6 years with U.S. Army Corps of Engineers; 8 years with USFWS, Region 5, Division of Conservation Planning and Policy

Jared Brandwein

Title	Refuge Manager
Affiliation	Back Bay NWR
Experience	2 years with Peace Corps, 1 year with US Forest Service, 4 years with the Bureau of Land Management, 23 years with the USFWS (2 years at Ninigret NWR Complex, 3 years Washington Office, 10 years Eastern PA Field Office, 8 years at Back Bay NWR)

Barbara Duke

Title	Planner III
Affiliation	City of Virginia Beach Department of Parks and Recreation
Experience	Certified Planner, Land Use, Trails, and Environmental Planning and Design

Todd Engelmeyer

Title	District Wildlife Biologist
Affiliation	Virginia Department of Game and Inland Fisheries

Experience	2 years with Oregon Department of Fish and Wildlife, 3 years with the US Army—Ft. Eustis, 6 years with Virginia Department of Game and Inland Fisheries

Barry Frankenfield

Title	Design and Development Administrator
Affiliation	City of Virginia Beach Department of Parks and Recreation
Experience	Certified Landscape Architect, Certified Planner, Planning, Design, and Construction for a wide variety of Park and Recreation Facilities

John Gallegos

Title	Senior Wildlife Biologist
Affiliation	Back Bay NWR
Experience	32 years with USFWS (worked at refuges in NY, NJ, VT, VA)

Chris Lowie

Title	Deputy Refuge Manager
Affiliation	Back Bay NWR
Experience	15 years with USFWS (13 years with Fisheries program, 2 years at Back Bay NWR)

Lelaina Marin

Title	Assistant Refuge Planner
Affiliation	USFWS Region 5 Regional Office
Experience	3.5 years with USFWS

Brian Phelps

Title	Planner II
Affiliation	City of Virginia Beach Department of Parks and Recreation
Experience	Planning, Design & Construction for a variety of Park & Recreation projects such as Neighborhood Parks; Trails, Playgrounds, Water Access/Boat Launch Facilities

Dorie Stolley

Title	Wildlife Biologist
Affiliation	Back Bay NWR
Experience	2 years with the National Park Service, 7 years with USFWS (4 years at Santa Ana and the Lower Rio Grande Valley NWRs and 3 years at Back Bay NWR)

Walter Tegge

Title	Visitor Services Manager
Affiliation	Back Bay NWR
Experience	8.5 years with the National Park Service; 1 year with the US Army Corps of Engineers; 4.5 years with the US Forest Service; 10.5 years with the Bureau of Land Management; 8 years with USFWS

Assistance from other Service Personnel

Barry Brady
Refuge Policy Specialist
USFWS Region 5 Regional Office

Paul Caldwell
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(Former Deputy Refuge Manager at Back Bay NWR)

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Reese Lukei
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(Former IT Specialist at Back Bay NWR)

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Great Dismal Swamp NWR
(Former Wildlife Biologist with the Virginia Department of Game and Inland Fisheries)

John Stasko
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Assistance from federal, state, local and other partners

Clay Bernick
Environmental Management Administrator
City of Virginia Beach Department of Planning

Molly Brown
President
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Barbara Henley
Councilwoman – Princess Anne District, City of Virginia Beach

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Matt Knox
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Jim Reeve
Former Councilman – Princess Anne District
City of Virginia Beach

Kendell D. Jenkins
GIS Specialist
Wildlife Diversity Division
Virginia Department of Game and Inland Fisheries

Appendix L



USFWS

Feral Hog at Back Bay

Finding of No Significant Impact (FONSI)

Finding of No Significant Impact

Back Bay National Wildlife Refuge
Comprehensive Conservation Plan

In March 2010, the U.S. Fish and Wildlife Service (Service) published the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Back Bay National Wildlife Refuge (refuge). The refuge is currently 9,035 acres and located in the City of Virginia Beach, Virginia. The Draft CCP/EA identifies the refuge's purposes, proposes a vision statement, and includes management goals and objectives to be achieved through plan implementation. The Draft CCP/EA evaluates three alternatives for managing the refuge over the next 15 years and compares their potential contribution to the refuge's purposes, vision, goals, and the mission of the National Wildlife Refuge System (Refuge System). Alternative B is identified as the Service-preferred alternative. Chapter 2 in the draft plan details the respective goals, objectives, and strategies for each of the three alternatives. Chapter 4 describes the predicted direct, indirect, and cumulative impacts on the environment from implementing each alternative. The draft plan's appendices provide additional information supporting the assessment and specific proposals in Alternative B. A brief overview of each alternative as it was presented in the draft CCP/EA follows.

Alternative A (Current Management): The Council of Environmental Quality regulations on implementing the National Environmental Policy Act (NEPA) require this "No Action" alternative, which we define as current management. Alternative A includes our existing programs and activities and serves as the baseline against which to compare the other alternatives. Under current management, we manage a series of wetland and moist-soil impoundments, forested and shrub-scrub habitats, and coastal beach and dune habitats. Under Alternative A, we would continue to conduct land bird, marsh bird, and migratory waterfowl surveys, continue to conduct nesting and stranded sea turtle patrols, and continue current methods of nuisance and non-native species control. We would maintain existing opportunities for visitors to engage in wildlife observation, photography, and environmental education and interpretation, as well as maintain existing hunting and fishing opportunities on the refuge. We would maintain existing infrastructure and buildings, and maintain current staffing levels. While this alternative is intended as a "snapshot in time," we include activities that were underway at the time the plan was being prepared, some of which are completed, and some of which are still in progress.

Alternative B (the Service-preferred alternative): This alternative includes an array of management actions that, in our professional judgment, work best toward achieving the purposes of the refuge, our vision and goals for those lands, the Refuge System mission, and the goals in State and regional conservation plans. This alternative focuses on enhancing the conservation of wildlife through habitat management,

as well as providing additional visitor opportunities on the refuge. Alternative B incorporates existing management activities and/or provides new initiatives or actions aimed at improving efficiency and progress towards refuge goals and objectives. Some of the major strategies proposed include: Opening up forest canopy by selectively removing loblolly pine, sweetgum, and red maple; withdrawing the 1974 wilderness designation proposal for Long Island, Green Hills, and Landing Cove (2,165 acres); developing a canoe/kayak trail on the west side of the refuge; expanding the deer hunt and developing new hiking trails; and developing and designing a new headquarters/ visitor contact station. We would also expand opportunities for the six priority public uses of the Refuge System, and emphasize wildlife observation and photography, and interpretation.

The expansion of visitor facilities and services, as well as the projected increase in visitation, would require additional staffing support to meet public expectations, and provide for public safety, convenience, and a high quality experience for refuge visitors. Partnering, interagency agreements, service contracting, internships, and volunteer opportunities would increase in order to help provide this staffing support.

We would also continue our monitoring and inventory program, and regularly evaluate the results to help us better understand the implications of our management actions and identify ways to improve their effectiveness.

Alternative C (Improved Biological Integrity): Alternative C prominently features additional management that aims to restore (or mimic) natural ecosystem processes or functions to achieve refuge purposes. Alternative C focuses on using management techniques that would encourage forest growth and includes an increased focus toward the previously proposed wilderness areas. Some of the major strategies proposed include: Developing an interagency agreement that would allow the 1974 proposed wilderness areas at Long Island, Green Hills, and Landing Cove (2,165 acres) to again meet minimum criteria, and then manage accordingly; and, creating conditions that allow us to shift more resources from intensive management of the refuge impoundment system to the restoration of Back Bay-Currituck Sound. In addition, we propose to continue enhancing visitor services by: Developing a hiking trail along Nanney's Creek; initiating actions to open the Colchester impoundment for fishing opportunities; considering additional waterfowl hunting areas; developing and designing a new headquarters/visitor contact station that provides more office space than proposed for Alternative B; and working with partners to provide a shuttle (for a fee) service from the new headquarters site to the barrier spit.

We distributed the Draft CCP/EA for a 33-day period of public review and comment from March 30, 2010, to May 1, 2010. During the comment period, 162 letters were received representing 174 individual signatures, 11 government agencies, and members of 7 organizations. A total of 90 individual comments were assessed during the content analysis process. Appendix K in the final CCP includes a summary of those comments, our responses to them, and additional rationale for the changes we make in the final CCP outlined below.

After reviewing the proposed management actions, and considering all public comments and our responses to them, we have determined that the analysis in the Draft CCP/EA is sufficient to support my findings. We are selecting Alternative B, as presented in the Draft CCP/EA with the following changes recommended by the planning team, to implement as the final CCP. Changes made to Alternative B in the final CCP are:

- We have no objection to the concept of the Lago Mar to Sandbridge Trail (the route of which is not yet specifically defined or mapped but would primarily be a City of Virginia Beach project along their right-of-way), but the refuge cannot make a determination until we complete a NEPA analysis. The analysis will occur after we receive the City of Virginia Beach's plan, which should include details on developing a trailhead and spur from the proposed new Refuge Visitor Center to the Lago Mar portion of the trail. We have included a map of the City's proposed trail near Sandbridge Road that was not included in the draft CCP/EA.

- We inserted language recognizing the important partnership we have with state agencies and the need to follow required state regulations during construction of new facilities.

- We clarified with much greater detail the goals, objectives, strategies and rationale of the refuge management direction, especially in terms of habitat management.

- We corrected all format and typographical errors that were brought to our attention.

We concur that modified Alternative B, including the above changes, helps fulfill the mission of the Refuge System; best achieves the refuge's purposes, vision, and goals; maintains and, where appropriate, helps restore the refuge's ecological integrity; addresses the major issues identified during the planning process; and is consistent with the principles of sound fish and wildlife management. Specifically, in comparison to the other two alternatives, modified Alternative B promotes diversity of habitat types for migratory birds, especially waterfowl, through its combination of wetland, upland, and dune management. It also provides the most reasonable and effective enhancements to existing public use programs that are in high demand, with minimal impacts to wildlife and habitats. The plans to increase staffing and improve infrastructure are reasonable, practicable and will result in the most efficient management of the refuge and best serve the American public. This Finding of No Significant Impact includes the EA by reference.

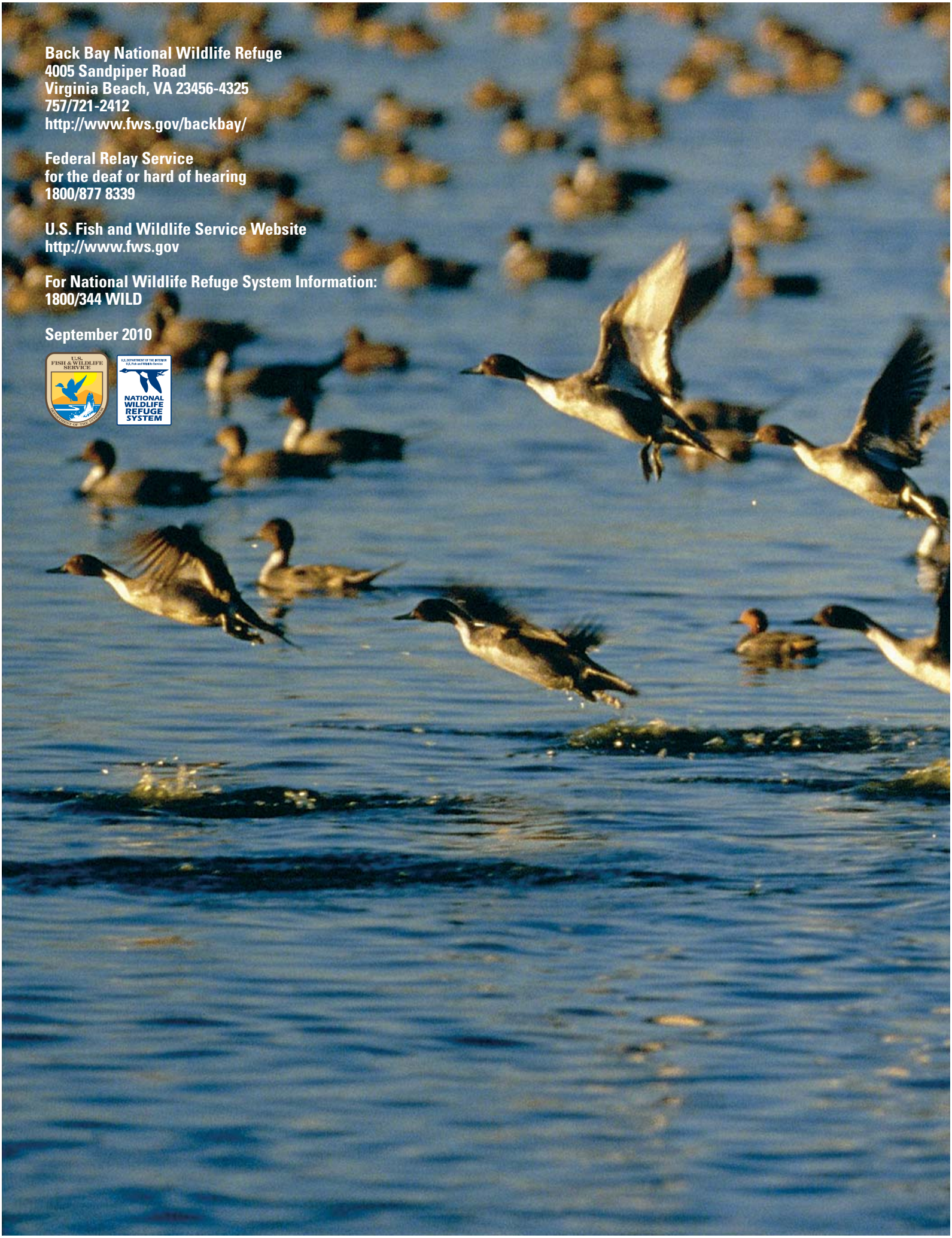
We have reviewed the predicted beneficial and adverse impacts associated with Alternative B that are presented in Chapter 4 of the Draft CCP/EA, and compared them to the other alternatives. We specifically reviewed the context and intensity of those predicted impacts over the short and long-term, and considered their cumulative effects. We have also determined that the proposed changes to Alternative B described are within the scope and scale of the alternatives analysis conducted in the Draft CCP/EA and no additional analysis is needed. Our evaluation concludes that implementing modified Alternative B will not result in any concerns with public health or safety, nor result in adverse implications to any unique

cultural or natural characteristics of the geographic area, including wetlands or Federal-listed species. We find that implementing modified Alternative B adheres to all legal mandates and Service policies, and will not have a significant impact on the quality of the human environment, in accordance with Section 102(2)(c) of NEPA. Therefore, we conclude 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

Acting

9-30-10
Date



Back Bay National Wildlife Refuge
4005 Sandpiper Road
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757/721-2412
http://www.fws.gov/backbay/

Federal Relay Service
for the deaf or hard of hearing
1800/877 8339

U.S. Fish and Wildlife Service Website
http://www.fws.gov

For National Wildlife Refuge System Information:
1800/344 WILD

September 2010