Chapter 2

Amanda Boyd/USFWS

*Summer wildlife-dependent recreation at the refuge*

# Alternatives Considered, Including the Service-preferred Alternative

- Introduction
- Formulating Alternatives
- Actions Common to All of the Alternatives
- Alternatives or Actions Considered but Eliminated from Further Analysis
- Alternative A: Current Management
- Alternative B: Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative)
- Alternative C: Wildlife Diversity and Natural Processes Emphasis
- Summary Matrix of the Considered Alternatives

## Introduction

This chapter describes our process for formulating alternatives, the actions that are common to all of the alternatives, and the three alternatives we analyzed in detail. At the end of this chapter, Table 2.1 compares how each of the alternatives addresses key issues, supports major programs, and achieves refuge goals.

## Formulating Alternatives

### Relating Goals, Objectives, and Strategies

Refuge goals and objectives define each of the management alternatives identified below. Refuge goals are intentionally broad, descriptive statements of the desired future condition of refuge resources. By design, they define the targets of our management actions in prescriptive rather than quantitative terms. They also articulate the principal elements of the refuge purposes and vision statement, and provide a foundation for developing specific management objectives and strategies.

Objectives are essentially incremental steps toward achieving a goal and further define management targets in measurable terms. They vary among the alternatives and provide the basis for developing detailed strategies that monitor refuge accomplishments and evaluate progress. "Writing Refuge Management Goals and Objectives: A Handbook" (USFWS 2004) recommends writing "SMART" objectives that are: (1) specific, (2) measurable, (3) achievable, (4) results-oriented, and (5) time-fixed.

Where possible, we incorporated the principles of Strategic Habitat Conservation (SHC) in the development of our objectives and strategies. According to "Strategic Habitat Conservation: A Report from the National Ecological Assessment Team" (USFWS 2006), SHC focuses on "…the ability of the landscape to sustain species as expressed in measurable objectives." Developing a strategy to attain a biological outcome, such as a population objective, requires documented and testable assumptions to determine whether the objective is met." Not only will this approach ensure refuges are contributing to the refuge system and Service mission and goals in a strategic, standardized, and transparent way, but also ensures that refuges contribute to local and regional conservation priorities and goals (USFWS 2008b).

A rationale accompanies each objective to explain its context and importance. We will use the objectives in the alternative selected for the final CCP to write refuge step-down plans, which we describe later in this chapter.

Next we identified strategies, or the actions, tools, or techniques we may use to achieve each objective. The list of strategies in each objective represents the potential suite of actions we may implement. We will evaluate most of them further as to how, when, and where we should implement them when we write our refuge step-down plans. We will measure our successes by how well our strategies achieve our objectives and goals.

### Developing Alternatives, including the "No Action" or "Current Management" Alternative

A wide range of possible management objectives and strategies that could achieve our goals were identified by the planning team, the public, and our partners. The planning team evaluated that input further, and began the next step of designing management alternatives. Alternatives are essentially packages of complementary objectives and strategies designed to meet refuge purposes and the refuge system mission and goals, while responding to the issues and opportunities that arose during the planning process. Objectives that seemed to fit together were grouped into "alternative themes." For example, we considered such themes as "current management," "enhanced wildlife management and

visitor services," and "natural processes management." After evaluating how the objectives would interact, their compatibility with refuge purposes, and the reality of accomplishing them within a reasonable period, these were formed into three management alternatives.

In this chapter, we fully analyze three alternatives that characterize three different ways of managing the refuge over the next 15 years. We believe they represent a reasonable range of alternative proposals for achieving the refuge purpose, vision, and goals, and addressing the issues described in chapter 1. Unless otherwise noted, refuge staff would implement all actions.

Alternative A satisfies the NEPA requirement of a "no action" alternative, which we define as continuing the status quo, or current management. It describes our existing management priorities and activities, and serves as a baseline for comparing and contrasting alternatives B and C. Current management efforts consist of limited biological, visitor services, and enforcement activities as staff and funding allow. Please refer to Chapter 3, "Affected Environment," for detailed descriptions of current refuge resources and programs.

Please note that some of the objectives in alternative A do not strictly follow Service guidance on writing SMART objectives. This is because we are describing current management decisions and activities that were established prior to recent guidance documents. Our descriptions of those activities devolve from a variety of formal and informal management decisions and planning documents. Thus, the objectives in alternative A are more subjective than are those in alternatives B or C.

Alternative B, the Service-preferred alternative, combines the actions we believe would most effectively achieve the refuge purposes, vision, goals, and respond to public issues. It emphasizes larger landscape-level conservation of coastal dune and beach habitat for priority bird species that are federally listed or State-listed threatened or endangered, and/or of conservation concern in the BCR 30 plan and the MA CWCS. Management would be consistent with State and Federal piping plover and tern guidelines, and would also afford protection to staging terns in the late summer and fall. It establishes adaptive beach closure zones designed to allow compatible beach recreation while protecting important wildlife habitat. It proposes management on the refuge, but also looks beyond this approximately 21-acre refuge to larger scale conservation and land protection, across Nantucket and adjacent islands, through partnerships and cooperative management. It calls for a coordinated regional study of bird use, specifically roseate and common terns, to help land managers provide protection for key species and habitat, while also attempting to allow for compatible wildlife-dependent recreation into the future. This alternative would also enhance our current level of visitor services on refuge lands as well as visitor opportunities on partner lands. In addition, there would be increases in research, inventories, monitoring, law enforcement, and developing new partnerships. This alternative seeks a balance between wildlife protection, through beach closure and symbolic fencing or key habitats, and access for the compatible wildlife-dependent priority public uses at the refuge.

Alternative C seeks to enhance biodiversity and environmental health, so that existing, traditional recreational uses would be restricted in favor of more protection of focal waterbird species. It is similar to alternative B but takes protection one step further by proposing to extend seasonal vehicular access closures over most of the refuge between April 1 and September 15 each year to minimize disturbance to dynamic beach habitat. Visitor services programs would be expanded from current levels, similar to alternative B, but unlike alternative B, most efforts would be focused on the refuge. Land protection efforts outside the refuge would be more similar to alternative A than alternative B.

## Actions Common to All of the Alternatives

All of the alternatives share the following common actions or elements. These occur at varying degrees or levels as described in each alternative. Some of the actions are required by law or policy, or represent management decisions that have undergone NEPA analysis including public review, agency review, and approval. Others may be administrative actions that do not require public review, but which we want to highlight in this public document.

All of the following actions are current practices or policies that would continue under all alternatives:

- Using an adaptive management approach
- Incorporating SHC
- Controlling pest plants and animals, including integrated pest management (IPM)
- Monitoring and abatement of diseases affecting wildlife health
- Facilitating or conducting biological research and investigations
- Addressing the threats of accelerating sea level rise and climate change
- Issuing special use permits
- Protecting cultural resources
- Implementing a wildlife-dependent recreation program, where possible
- Completing findings of appropriate use and compatibility determinations, which indicate which activities are allowed, including non-priority public uses such as swimming, sunbathing, and beachcombing.
- Continuing the closure of the refuge to dogs year-round and not allowing fireworks, kites, camping, and any other uses not found to be compatible
- Pursuing an updated MOU or Partnership Agreement with TTOR which addresses resource management, visitor use, and additional funding sources and support to help fund refuge operations
- Providing refuge staffing and administration
- Completing refuge step-down plans
- Distributing refuge revenue sharing payments annually to the town of Nantucket

### Adaptive Management

All of the alternatives will include flexibility in management to allow us to respond to new information, spatial and temporal changes, and environmental events, whether foreseen or unforeseen, or other factors that influence management. Our goal is to be able to respond quickly to any new information or events. The need for flexible or adaptive management is very compelling today because our present information on refuge species and habitats is incomplete, provisional, and subject to change as our knowledge base improves.

We will continually evaluate management actions, both formally and informally, through monitoring or research, to consider whether our original assumptions and predictions remain valid. In that way, management becomes a proactive process of learning what really works. On March 9, 2007, Secretary of the Interior Dirk Kempthorne issued Secretarial Order No. 3270 to provide guidance on policy and procedures for implementing adaptive management in Departmental agencies. In 2007, an intradepartmental working group developed a guidebook to assist managers and practitioners: "Adaptive Management: The U.S. Department of the Interior Technical Guide." It defines adaptive management, the conditions under which we should consider it, and the process for implementing it and evaluating its effectiveness. You may view the guidebook at *http://www.doi.gov/initiatives/AdaptiveManagement/documents.html* (accessed March 2011).

Adaptive management, as it relates to refuge management, promotes flexible decisionmaking through an iterative learning process that responds to uncertainties, new information, monitoring results, and the natural variability in ecosystems. It is designed to facilitate more effective decisions and enhanced benefits. At the refuge level, monitoring management actions, outcomes, and key resources will be very important. The refuge manager is responsible for changing management actions and strategies if they do not produce the desired conditions. Significant changes from what we present in our final CCP may warrant additional NEPA analysis and public comment.

Generally, we can increase monitoring and research that support adaptive management without additional NEPA analysis. Many of our objectives identify monitoring elements. Our Inventory and Monitoring Plan (IMP) will determine future survey efforts. Implementing an adaptive management approach supports all three goals of the refuge.

### Strategic Habitat Conservation

SHC is a framework that utilizes adaptive management to redefine broad scale conservation from the general pursuit of conserving "more" habitat and species, to a more planned approach based on scientific data, at a landscape level, and in cooperation with partners. It starts with explicit, measurable objectives that are based on testable assumptions that can be evaluated, and is enacted through an iterative process of biological planning, conservation design, conservation delivery, assumption-driven research, and outcome-based monitoring. The goal is to set specific population objectives for species that are limited in some way by habitat (though this would be effective for other limiting factors as well), and to use targeted habitat management approaches to meet those objectives. Inherent in the process is a continual evaluation of biological outcomes and approaches, with the intent to adapt the overall conservation strategy to respond to changing circumstances and new information.

### Controlling Pest Plants and Animals

At times, native plants and animals interfere with management objectives. The Refuge Manual (7 RM 14.4A) defines a pest as "Any terrestrial or aquatic plant or animal which interferes, or threatens to interfere, at an unacceptable level, with the attainment of refuge objectives or which poses a threat to human health." This definition also includes non-native invasive species (see below).

**Integrated Pest Management**

In controlling pests, whether non-native or native species, we use an integrated approach. The Refuge Manual (7 RM 14.4C) defines integrated pest management (IPM) as "A dynamic approach to pest management which utilizes a full knowledge of a pest problem through an understanding of the ecology of the pest and ecologically related organisms and through continuous monitoring of their populations. Once an acceptable level of pest damage is determined, control

programs are carefully designed using a combination of compatible techniques to limit damage to that level."

The refuge's IPM program will be on file at the refuge complex headquarters when complete. The IPM is a step-down plan from the CCP and supplements both the CCP and Habitat Management Plan (HMP) with documentation on how to manage invasive or pest species. Along with a more detailed discussion of IPM techniques, this documentation describes the selective use of pesticides for pest management on the refuge, where necessary. Pesticide uses with appropriate and practical best management practices (BMPs) for habitat management would be approved for use on the refuge where there likely would be only minor, temporary, and localized effects to species and environmental quality based upon non-exceedance of threshold values in the chemical profiles. Our control program would address the most critical problems first and can be adjusted to reflect Regional Service priorities, the availability of new information, or a new resource.

**Managing Invasive Species**

The establishment and spread of invasive species, particularly invasive plants, is a significant problem that reaches across all habitat types. For the purposes of this discussion, we use the definition of invasive species contained in the Service Manual (620 FW 1.4E): "Invasive species are alien species whose introduction does or is likely to cause economic or environmental harm, or harm to human health. Alien species, or non-indigenous species, are species that are not native to a particular ecosystem. We are prohibited by Executive Order, law, and policy from authorizing, funding, or carrying out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere." This discussion focuses solely on invasive plant species.

G.A. Cooper @ USDA-NRCS PLANTS Database

*Multiflora rose*

Multiflora rose *(Rosa multiflora)* is the only invasive plant species which has been identified on Nantucket NWR (see chapter 3), however, no comprehensive vegetation survey has been conducted. In addition, any invasive species on adjacent lands could pose problems for the refuge in the future. Our management of invasive plants would vary in degree by the alternative chosen. Invasive species may out-compete native plants reducing available food and habitat required by other native avian and mammalian species. No comprehensive survey of invasive plants has been conducted on the refuge due to a lack of staff time and availability of funds.

The unchecked spread of invasive plants threatens the biological diversity, integrity, and environmental health of all national wildlife refuge habitats. In many cases, they have a competitive advantage over native plants and form

dominant cover types, reducing the availability of native plants as food and cover for wildlife. Over the past several decades, government agencies, conservation organizations, and the public have become more acutely aware of the negative effects of invasive species. Many plans, strategies, and initiatives target the more effective management of invasive species, including "The National Strategy for Management of Invasive Species for the National Wildlife Refuge System" (USFWS 2003a), "Silent Invasion—A Call to Action," by the National Wildlife Refuge Association (2002), and "Plant Invaders of Mid-Atlantic Natural Areas," by the Service and the National Park Service (Swearingen et al. 2002).

Guidance on managing invasive species on refuges appears in the Service Manual (620 FW 1.7G). The following actions define our general strategies on the refuge:

1) Manage invasive species on refuges under the guidance of the National Strategy for Invasive Species Management and within the context of applicable policy.

2) Manage invasive species to improve or stabilize biotic communities to minimize unacceptable change to ecosystem structure and function, and to prevent new and expanded infestations of invasive species.

3) Evaluate native habitat management activities with respect to their potential to accidentally introduce or increase the spread of invasive species and modify our habitat management operations to prevent increasing invasive species populations.

4) Conduct refuge habitat management (including working through partners) to prevent, control, or eradicate invasive species using techniques described through an IPM plan, or other similar management plan. The plans comprehensively evaluate all potential integrated management options, including defining threshold/risk levels that will initiate the implementation of proposed management actions.

5) Refuge IPM planning addresses the abilities and limitations of potential techniques including chemical, biological, mechanical, and cultural techniques. See the additional discussion on IPM below.

The following actions define our specific strategies for the refuge:

1) Treat the most problematic species as funding and staffing permit, in accordance with the selected alternative.

2) Develop early-detection/rapid-response readiness regarding new invasions.

3) Remove the parent sources of highly invasive species (e.g., species that are high seed producers or vigorous rhizome producers).

4) Maintain accessibility to affected areas for control and monitoring if possible.

### Monitoring and Abating Wildlife and Plant Diseases

The Service has not yet published its manual chapter on Disease Prevention and Control. In the meantime, we derive guidance on this topic from the Refuge Manual and specific directives from the Director of the Service or the Secretary of the Interior. The Refuge Manual (7 RM 17.3) lists three objectives for the prevention and control of disease:

1) Manage wildlife populations and habitats to minimize the likelihood of the contraction and contagion of disease.

2) Provide for the early detection and identification of disease mortality when it occurs.

3) Minimize the losses of wildlife from outbreaks of disease.

The Service published these objectives in 1982. Since then, in addition to diseases that cause serious mortality among wildlife, diseases transmitted through wildlife to humans have received more attention. One example is Lyme disease. In 2002, the Service published a Service Manual chapter (242 FW 5) on Lyme Disease Prevention to inform employees, volunteers, and national service workers about this disease, its prevention, and treatment.

Another serious wildlife disease that receives considerable attention worldwide is avian influenza. Of particular concern is the highly pathogenic Eurasian form (H5N1). In 2006, the Service instructed all refuges to prepare an Avian Influenza Surveillance and Contingency Plan. This plan covers all eight refuges in the Eastern Massachusetts NWR Complex, and was completed in 2007.

In addition to the diseases of wildlife, we will be attentive to the diseases and pests that affect the health of the ecosystems that Nantucket NWR supports, and respond to varying degrees based upon the alternative chosen. Under all alternatives, we would continue to opportunistically monitor for, and report, seabird mortality events on refuge beaches. In addition, we would record and report instances of seal entanglements or strandings, because these are instances that could lead to increased susceptibility to disease mortality. It is likely that other monitoring efforts would be minimal, and the occurrence of any wildlife or habitat disease element would be responded to only if they posed an immediate or serious threat to indigenous wildlife and habitat. The Service would respond at a level commensurate with staffing and funding.

These are the general strategies for preventing or controlling disease:

1) Continue to conduct disease surveillance in conjunction with other fieldwork.

2) Cooperate with State agencies, particularly MassWildlife, by providing access for sampling and following protocols in the event of an outbreak.

3) Inform volunteers and others who work in the field about the dangers of Lyme disease and measures to avoid contracting it.

4) Monitor habitats for indicators of the increased occurrence of pests or disease. For example, anecdotally note changes in flowering or fruiting phenology that do not appear to be linked to climate change, and be vigilant for signs of physical damage, decay, weakening, sudden death, particularly of major host species, and changes in wildlife use of habitats, such as the absence of breeding birds that used to appear regularly.

5) Follow the protocols in national, State, and refuge disease prevention and control plans.

Karen Terwilliger/TCI

*Staging terns on the refuge*

**Biological and Ecological Research and Investigations**

The Refuge Manual and the Service Manual both contain guidance on conducting and facilitating biological and ecological research, and investigations on refuges. In 1982, the Service published three objectives in the Refuge Manual for supporting research on units of the refuge system (4 RM 6.2):

1) To promote new information and improve the basis for, and quality of, refuge and other Service management decisions;

2) To expand the body of scientific knowledge about fish and wildlife, their habitats, the use of these resources, appropriate resource management, and the environment in general; and,

3) To provide the opportunity for students and others to learn the principles of field research.

In 2006, the Service Manual provided supplemental guidance on the appropriateness of research on refuges: "We actively encourage cooperative natural and cultural research activities that address our management needs. We also encourage research related to the management of priority general public uses. Such research activities are generally appropriate. However, we must review all research activities to decide if they are appropriate or not as defined in section 1.11. Research that directly benefits refuge management has priority over other research" (603 FW 1.10D(4)).

All research conducted on the refuge must be determined in writing to be both appropriate and compatible, unless we determine it to be an administrative activity. Research projects also must contribute to a need identified by the refuge or the Service. Opportunities to conduct research on the refuge may arise under any of the alternatives we propose in this draft CCP/EA. In determining the

appropriateness and compatibility of future research proposals, we will follow the guidance in the manuals, and will employ the following general strategies:

1) Seek qualified researchers and funding to help answer refuge-specific management questions.

2) Participate in appropriate multi-refuge studies conducted in partnership with the U.S. Geological Survey (USGS), or other entity.

3) Coordinate with partners to initiate or conduct research on priority issues identified at local and regional scales. For example, a landscape level roseate tern study is being planned that can better determine the timing and use of Nantucket, and adjacent islands, to determine the refuge's contribution and future need for active management and beach restrictions to benefit roseate terns.

All researchers will be required to submit detailed research proposals following the guidelines established by Service policy and refuge staff. Special use permits will also identify the schedules for progress reports, the criteria for determining when a project should cease, and the requirements for publication or other interim and final reports. All publications will acknowledge the Service and the role of Service staff as key partners in funding and/or operations.

### Addressing the Threats of Accelerating Sea level Rise and Climate Change

Climate change is an issue of increasing public concern because of its potential effects on land, water, and biological resources. The issue was pushed to the forefront in 2007 when the Intergovernmental Panel on Climate Change (IPCC), representing the world's leading climate scientists, concluded that it is "unequivocal" that the Earth's climate is warming, and that it is "very likely" (a greater than 90 percent certainty) that the heat-trapping emissions from the burning of fossil fuels and other human activities have caused "most of the observed increase in globally averaged temperatures since the mid-20th century" (IPCC 2007). The Northeast is already experiencing rising temperatures, with potentially dramatic warming expected later this century under some model predictions. According to the Northeast Climate Impacts Assessment (NECIA) team, "continued warming, and more extensive climate-related changes to come could dramatically alter the region's economy, landscape, character, and quality of life" (Frumhoff et al. 2007).

Other predicted climate-related changes, beyond warming temperatures, include changing patterns of precipitation, significant acceleration of sea level rise, changes in season lengths, decreasing range of nighttime versus daytime temperatures, declining snowpack, and increasing frequency and intensity of severe weather events (Inkley et al. 2004). Since wildlife species are closely adapted to their environments, they must respond to climate variations, and the subsequent changes in habitat conditions, or they will not survive. Unfortunately, the challenge for wildlife is all the more complicated by increases in other environmental stressors such as pollution, land use developments, ozone depletion, exotic species, and disease. Wildlife researchers and professionals, sportsmen, and other wildlife enthusiasts are encouraging positive and preemptive action by land managers. Some recommendations for action include: reducing or eliminating those environmental stressors to the extent possible, managing lands to reduce risk of catastrophic events, managing for self-sustaining populations, and looking for opportunities to ensure widespread habitat availability (Inkley et al. 2004).

The Service is becoming more aware and knowledgeable about the impacts of climate change on national wildlife refuges. A proposed Climate Change

Strategic Plan and a 5-Year Action Plan have been drafted to provide specific direction to the Service's climate change response initiatives (see chapter 1). Nantucket NWR could be a prime location for long-term and remote research and monitoring. To date, a Sea Level Affecting Marshes Model (SLAMM) analysis has been conducted to predict refuge shoreline changes over the next century under four different sea level rise scenarios (see chapter 3 and Appendix H). At the refuge, we recognize the need for an increase in biological monitoring and inventories, two actions that are critically important for land managers to undertake in order to effectively respond to the uncertainty of future climate change effects. The alternatives would differ, however, in the extent to which these monitoring efforts take place, as well as the ability to monitor shoreline and other impacts associated with climate change. This would primarily be based on the availability of staff and funds. Under all alternatives, it will be important to coordinate with the State's climate change strategies as they are further refined. The establishment of the North Atlantic Landscape Conservation Cooperative (LCC; see chapter 3) will also facilitate the exchange of information and coordination among agencies in the region to implement climate change strategies.

### Special Use Permits

All of the alternatives would require the refuge manager to evaluate activities that require a special use permit for their appropriateness and compatibility on a case-by-case basis. Typically, there is a fee associated with these permits. We anticipate the number of special use permits that will be issued to be limited. We will only approve permit requests that provide a direct benefit to the refuge, or for research that will strengthen our decisions on managing natural resources on the refuge. The refuge manager also may consider requests that do not relate directly to refuge objectives, but to the protection or enhancement of native species and biological diversity in the region, and support the goals of recognized ecoregional conservation teams, such as the ACJV.

### Protecting Cultural Resources

As a Federal land management agency, we are responsible for locating and protecting all historic resources; specifically, archeological sites and historic structures eligible for listing or listed on the National Register of Historic Places. This applies not only to refuge land, but also to land affected by refuge activities. Our consultation with the Massachusetts State Historic Preservation Officer (MA SHPO) indicates that no archeological sites are recorded on refuge land. However, no professional survey has been conducted, and Great Point is a dynamic landform with eroding and accreting areas. Archaeological sites might be exposed at any time through erosion.

Under all the alternatives, we will evaluate the potential for impact on archeological and historical resources as required. We will consult with the MA SHPO and the Tribal Historic Preservation Officers (THPO) for the Wampanoag Tribe of Gay Head (Aquinnah) and the Mashpee Wampanoag Tribe. These activities will ensure that we comply with Section 106 of the National Historic Preservation Act, regardless of the alternative. Compliance may require a State Historic Preservation Records survey, literature survey, or field survey.

### Conducting a Wilderness Review

As we described in chapter 1, refuge system planning policy requires that we conduct a wilderness review during the CCP process. The first step is to inventory all refuge lands and waters in Service fee simple ownership. Our inventory of this small refuge determined that the area does not meet the eligibility criteria for a wilderness study area as defined by the Wilderness Act. Therefore, we did not further analyze the refuge's suitability for wilderness designation. The results of the wilderness inventory are included in appendix C. The entire refuge will undergo another wilderness review in 15 years as part of the next planning process. Specifically, any lands acquired in fee by the Service

in the interim, along with existing refuge lands, will become part of that wilderness review in 15 years.

### Wildlife-Dependent Recreational Program

The Improvement Act designated six priority public uses on national wildlife refuges: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. As detailed in the Service's "General Guidelines for Wildlife-Dependent Recreation," (605 FW 1), we will strive to meet the criteria for a quality, wildlife-dependent recreation program.

Of the six priority public uses, only hunting is currently not allowed on the refuge. The informal surveys conducted by the Service (USFWS 1999), as well as TTOR (Donnelly and Vaske 1991), indicate that opportunities for the remaining five priority uses are being provided in some degree through partnerships, and are in demand by visitors and residents of Nantucket (see chapter 3). All of these activities, and hunting, are sufficiently provided elsewhere on Nantucket, including on adjacent TTOR land. As such, refuge land restrictions do not eliminate the opportunity for those public uses on the Coskata-Coatue Peninsula, or elsewhere on Nantucket.

In recent years, the Service has recognized the importance of connecting children with nature. Scholars and health care professionals are suggesting a link between a disconnection with the natural world and some physical and mental maladies in our Nation's youth (Louv 2005). We intend to promote the concept of connecting children and families with nature in all of our compatible recreational and educational programming. We look to our partners, TTOR, Maria Mitchell Association, NCF, and others, to help us expand environmental education and to develop and assist with programs for the other priority public uses on refuge lands.

### Appropriateness and Compatibility Determinations

Chapter 1 describes the requirements for determinations of appropriateness and compatibility. Appendix B includes draft appropriateness and compatibility determinations to support the activities in alternative B, the Service-preferred alternative. Our final CCP will include the approved compatibility determinations for the alternative selected, and future documents would address activities on newly acquired lands as part of the acquisition process. We will allow only the activities determined appropriate and compatible for meeting or facilitating refuge purposes, goals, and objectives.

**Activities Not Allowed**

According to Service policy (603 FW 1), if the refuge manager determines a use is not appropriate, it can be denied without determining its compatibility. An updated list of activities that have been found both compatible and appropriate are found in appendix B. Uses which are not included on this list are not allowed on the refuge.

### Refuge Staffing and Administration

Our proposals in this document do not constitute a commitment for staffing increases or funding for operations or maintenance. Congress determines our annual budgets, which our Washington headquarters and regional offices distribute to field stations. Chapter 3 presents our levels of staffing, operating, and maintenance funds for the refuge. The activities shared among the alternatives we describe below pertain to staffing, administration, and operations. Some are new activities and others are ongoing.

Under all three alternatives, the Service will investigate additional sources of funding to complement and augment existing budgets. The Memorandum of Understanding (MOU) between the Service and its neighboring partner, TTOR, has expired. All alternatives will include establishing a new, updated Partnership

Agreement which addresses resource management, visitor use, and additional funding sources and support to help contribute to refuge operations. Additional opportunities may emerge and be pursued as a result of expanding outreach and partnerships with key conservation partners.

**Permanent Staffing and Operational Budgets**
In all the alternatives, our objective is to sustain levels of annual funding and staffing that allow us to achieve refuge purposes, as interpreted by the goals, objectives, and strategies in this draft CCP/EA. Often, many highly visible projects are conducted through special project funds that typically have a 1- to 2-year duration. Although those funds are very important, their flexibility is limited because we cannot use them for any other priority project that may arise. Additionally, we cannot anticipate when, or if we will receive these funds.

In response to declines in operational funding Nationwide, we developed a regional "Strategic Workforce Plan for the National Wildlife Refuge System in Region 5" (Phase 2; memo dated January 16, 2007) to support a new base budget approach. Its goal is a maximum of 75 percent of a refuge station budget to cover salaries and fixed costs, while the remaining 25 percent or more will be operating and maintenance funds. Our strategy is to improve the capability of each refuge manager to do the project work of the highest priority, and not to have the refuge budget tied up in inflexible fixed costs. Unfortunately, in a level or declining budget environment, that also may have implications for the level of permanent staffing.

In 2008, the Service approved a national staffing model which identifies the number of staff needed at each refuge or refuge complex throughout the country. The model indicated that the Eastern Massachusetts NWR Complex should have 39.5 permanent positions. As previously indicated, there are currently 16 permanent employees in the refuge complex. In all of the alternatives, and within the guidelines of the new base budget approach, we would seek to fill positions which we believe are necessary to accomplish our highest priority projects, though it is unlikely that all 39.5 positions would be filled under any alternative. The staffing requests in alternative B would provide depth in our biological, visitor services, and law enforcement programs. We identify our recommended priority order for new staffing in the Refuge Operations Needs System (RONS) tables in appendix D. Appendix E identifies the staffing requests in each alternative.

**Facilities Construction and Maintenance**
Under all proposed alternatives, we will continue to make progress towards increasing the participation and presence of the Service by installing and maintaining interpretive and informational signs, and other printed materials. We will work with our partners, including TTOR, NCF, Maria Mitchell Association, and Massachusetts Audubon Society, to develop such signage, highlighting our collaborative partnerships. Under alternatives B and C, we would investigate opportunities to establish a joint visitor contact facility with TTOR and/or NCF offsite to provide a joint visitor information facility and a much-needed Service outpost on Nantucket Island for refuge staff and supplies. Any addition of signage or other examples of Service infrastructure on the refuge will be consistent with the intent and purpose of the proposed National Natural Landmark designation, and will endeavor to maintain the aesthetic value and quality of Great Point.

**Refuge Operating Hours**
All of the alternatives will open the refuge for public use from ½ hour before official sunrise to ½ hour after official sunset, except at night for surfcasting, seven days a week, to ensure visitor safety and protect refuge resources. The

refuge manager does have the authority to issue a special use permit to allow others access outside those periods. For example, we may permit access for research personnel or volunteers at different times, or organized groups to conduct nocturnal activities, such as wildlife observation, and educational and interpretive programs.

**Zone Management**
Under alternatives B and C, we are proposing a zone management system for the refuge that will indicate closed areas to OSVs and/or pedestrian traffic based on time of year and species presence. Though we do not currently apply zone management, under the alternative A discussions that follow, we use zone terminology in our discussions of refuge management to illustrate referenced locations for the sake of continuity across alternatives. Please see maps 2-1 through 2-3 for an illustration of the refuge zones and see the visitor access objectives under goal 2 for each alternative.

## Partnerships

All of the alternatives would maintain the existing partnerships identified in chapter 3. These relationships are vital to our success in managing all aspects of the refuge, from managing habitats and protecting species, to outreach and education, and providing wildlife-dependent recreation. In particular, all alternatives are committed to further strengthening our partnerships with TTOR, NCF, and the Maria Mitchell Association. The Maria Mitchell Association is a local organization that promotes state-of-the-art research and science on Nantucket and offers unique collaborative opportunities for research and public engagement. TTOR has played an invaluable role in managing and monitoring refuge shorebirds, including federally listed and State-listed species, over the last decade and will remain key partners in this capacity in the future under all alternatives. The MOU between the Service and TTOR has expired. All alternatives will include establishing a new, updated Partnership Agreement which addresses resource management, visitor use, and additional funding sources and support to help contribute to refuge operations. Both TTOR and NCF are our conservation partners on the Coskata-Coatue Peninsula, and both coordinate and oversee public use, staffing, and facilities maintenance. All of the alternatives reflect this status quo, but alternatives B and C reflect different levels of augmenting Service involvement and presence. Other important partners include the MassWildlife and Massachusetts Audubon Society.

Jim McCarthy/USFWS

*Sanderlings*

## Preservation of Scenic and Aesthetic Qualities

There are important scenic and aesthetic qualities to the refuge which are not well addressed through the biological and cultural landscape analyses included in this plan. These qualities are also important to preserve. We would be careful under all alternatives to meet the guideline in the Service's wildlife- dependant recreational program policy (605 FW 1) that recommends planning "…facilities that … blend into the natural setting." We would also support the entire landform's designation as a National Natural Landmark as recommended by TTOR. The nomination of such landmarks includes a careful analysis of those qualities that make the landform eligible for designation, and will help identify what physical attributes must be protected in order to preserve the experience of visiting Great Point.

## Protecting Land

In all alternatives, we would continue to work with the U.S. General Services Administration (GSA) to acquire excess Federal lands in partnership with other agencies, organizations, and willing sellers. Minimal additional land protection

will continue in alternatives A and C as the refuge only responds to select opportunities as they arise. Alternative B seeks to increase additional land protection, working towards a 1,790-acre goal for additional land protection on Nantucket and adjacent (see appendix G for more specific information). Under all alternatives, we will seek to achieve a balance of conservation easements and fee-title acquisition.

The permanent protection of land is the keystone of wildlife and habitat conservation. Land brought into the refuge system will be available in perpetuity to support fish, wildlife, and plants. We can restore, enhance, or maintain the land we purchase in fee title to provide optimal conditions for priority species targeted for conservation, such as threatened or endangered species, and those whose populations are in decline. Further, the land we protect through conservation easements will never convert to uses that would remove permanently their value for fish and wildlife.

Please note that the refuge conservation easement program targets lands that contain natural resources whose importance merits their inclusion in the refuge system, and are not simply open space easements. The goal of our easement program is to protect existing natural resources and work with the landowners to enhance those resources, including water quality buffers, while promoting the continuation of traditional uses of the land. The Land Protection Plan (appendix G) elaborates on Service policies and procedures, as well as options and potential impacts for alternatives considered under this draft CCP/EA.

To continue our progress toward our shared objectives in protecting land, we would employ the following, ongoing strategies:

- Work with partners to identify willing sellers in areas of concentrations of priority natural resources.
- Use our criteria for prioritizing land protection for lands that become available for purchase.
- Continue to coordinate regular meetings of land protection partners to facilitate communication and cooperation.
- Continue to seek opportunities to expand our land protection partnership.
- Seek opportunities for funding via grants and non-traditional means.
- Provide information to elected officials on land protection issues upon request.
- Work with partners and landowners to encourage land conservation outside the refuge boundary.
- Keep residents, organizations, and businesses in Nantucket informed about land protection issues through the distribution of outreach material and personal appearances by staff.

### Developing Refuge Step-down Plans

Service planning policy identifies 25 step-down plans that may be applicable on any given refuge. Two have been completed for the refuge complex as a whole, which includes Nantucket NWR. We have identified 11 additional plans as the most relevant to this planning process for the refuge, and we have prioritized their completion. Several are ongoing as part of the refuge complex planning, but others will be completed depending upon the alternative chosen and its associated level of funding and staffing to complete them. We list those plans and their

planned completion dates below. This draft CCP/EA presents sections of the refuge HMP that require public review. We will incorporate them into the final version of the HMP within 3 years of approval of the final CCP.

We will also develop an Annual Habitat Work Plan (AHWP) and Inventory and Monitoring Plan (IMP) as the highest priority step-down plans, regardless of the alternative selected for implementation. We describe them in more detail below. To keep them relevant, we will modify and update them as we obtain new information. The completion of these plans supports all refuge goals. All of the alternatives schedule the completion of these step-down management plans, according to the staffing and budgeting restrictions specific to each alternative.

All of the alternatives incorporate by reference the following completed plans that apply to the entire Eastern Massachusetts NWR Complex, including Nantucket NWR:

- Avian Influenza Surveillance and Contingency Plan—completed in 2007
- Hurricane Action Plan—completed in 2009, updated in 2010

All of the alternatives schedule the completion of these step-down management plans for the refuge after completion of the CCP. An updated Fire Management Plan is scheduled to be completed in 2011. Please see appendix F for general fire program direction. Step-down plans scheduled for completion include:

- AHWP, annually beginning within 3 years of CCP approval
- IPM Plan, within 2 years following CCP approval
- HMP, within 3 years following CCP approval
- Fishing Plan, within 3 years of CCP approval
- Sign Plan, within 3 years of CCP approval
- IMP, within 5 years of CCP approval
- Law Enforcement Management Plan, within 5 years of CCP approval
- Cultural Resources Management Plan, within 5 years of CCP approval
- Visitor Services Plan, within 5 years of CCP approval
- Migratory Bird Disease Contingency Plan, within 5 years of CCP approval
- Continuity of Operation Plan, within 5 years of CCP approval

**Habitat Management Plan**
The HMP will incorporate the selected alternative's habitat objectives developed herein, and will identify the "what, which, how, and when" actions and strategies we would implement over the 15-year period to achieve those objectives. Specifically, the HMP will define management areas and treatment units, identify the type or method of treatment, establish the timing for management actions, and define how we will measure success over the next 15 years. In this draft CCP/EA, the goals, objectives, and list of strategies in each objective identify how we intend to manage habitats on the refuge and will represent the varying levels of habitat management under each alternative. We base both the

CCP and HMP on current resource information, published research, and our own field experiences. We will update our methods, timing, and techniques as new, credible information becomes available. To facilitate our management, we will regularly maintain our Geographic Information System (GIS) database, documenting any major changes in vegetation or shoreline at least every 5 years, as staffing and funding allow. As appropriate, we will incorporate the actions common to all alternatives into the HMP.

**Annual Habitat Work Plan and Inventory and Monitoring Plan**
The AHWP and IMP for the refuge are also priorities for completion upon CCP approval. Regardless of the alternative chosen, those plans also are vital for implementing habitat management actions and measuring our success in meeting the objectives, although the levels will vary according to the alternative chosen. Each year, we will generate an AHWP that will outline specific management activities for that year. The IMP will outline the methodology to assess whether our original assumptions and proposed management actions support our habitat and species objectives. The IMP may also be used to monitor the potential effects of climate change on refuge habitats and wildlife populations. We will prioritize our inventory and monitoring needs in the IMP. The results of inventories and monitoring will provide us with more information on the status of our natural resources and allow us to make more informed management decisions.

## Distributing Refuge Revenue Sharing Payments

As described in chapter 2, we have provided funding in the form of shared revenues to the town of Nantucket for the refuge since the refuge was established. Those annual payments are calculated by formula determined by, and with funds appropriated by, Congress. All of the alternatives will continue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, or new appropriation levels dictated by Congress.

## NEPA Analysis

For all major Federal actions, NEPA requires the site-specific analysis and disclosure of their impacts, either in an EA or environmental impact statement (EIS). Generally, those include the administrative actions listed in chapter 4. Most of the actions proposed in the three alternatives, and fully analyzed in this draft CCP/EA are described in enough detail to comply with NEPA, and would not require additional environmental analysis. Although this list is not all-inclusive, the following projects fall into that category:

- Development of the HMP
- Development of the IMP
- Research, resource inventories, or other information collected
- Small construction and improvement projects (including addition of a primitive foot trail, signage)
- Operations and maintenance of existing infrastructure and facilities (including addition of signage and/or a kiosk at the entrance gate, and minor renovations should a building be purchased for a visitor facility)
- Law enforcement activities
- Control of invasive plants
- Predator or pest management program implementation
- Changes in our priority public use programs, with the exception of new proposed fishing program changes

## Alternatives or Actions Considered but Eliminated from Further Study

**1. Closing the refuge to all public access, vehicular and pedestrian, year round.**
Closing the refuge year round would not support the Service's priority public use policy and the Improvement Act which states, "Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System." The refuge beaches and the lighthouse are enjoyed by many visitors annually, and the Service is aware of the refuge's importance to local communities and vacationing visitors. A complete closure, without a better understanding of the ecological and socioeconomic costs and benefits, is not deemed to be warranted at this time. Conversely, we find some public uses to be compatible with refuge purposes, dependent on seasonality and species presence. Though some sections of the refuge may be closed temporarily to uphold our responsibility to protect species of conservation concern, there are still opportunities for recreation in other areas on the refuge, and/or throughout the fall and winter. The Service values its partners and the support of the community in long-term conservation of the refuge.

**2. Closing the refuge to all vehicular public access year round.**
While this alternative is certainly technically feasible, it is not socioeconomically feasible or practical for the Service to implement. OSV access has occurred consistently and traditionally before and after refuge establishment. First, it is the most common mode of access to the refuge property. OSVs provide access to the refuge, and facilitate five of the six Service priority public uses including environmental education, interpretation, wildlife photography and observation, and fishing. Secondly, our partners, mainly TTOR, rely almost exclusively on funding received from OSV permit fees to provide public access to their Coskata-Coatue property and Great Point, where they have been providing consistent coordinated management on Service property since refuge establishment. Lastly, this alternative is not environmentally different than what is proposed under alternative C, where vehicular access is greatly restricted temporally and spatially, to avoid impact to important refuge habitat and Service trust resources. We have retained, and fully evaluate, alternative C as the more feasible and practical alternative that addresses access issues.

Amanda Boyd/USFWS

*Access to Nantucket National Wildlife Refuge by oversand vehicles*

**3. Opening the refuge to all public access, vehicular and pedestrian, year round.**
The Service would not be in compliance with Federal, State, or local laws, or policies and guidelines, under this alternative. Specifically, we would be out of compliance with the Federal and State endangered species laws and wetland protection acts that require the Service (and all other landowners) to protect beach and shoreline habitat for the multiple purposes of those acts. In addition, the refuge has the responsibility to determine activities to be appropriate and compatible with refuge purposes, and unrestricted use of the refuge would not support an affirmative determination.

**4. Relinquishing management authority to TTOR.**
The Service has been a relatively absentee landowner due to staffing limitations. With this CCP, and the renewed opportunity for additional funding to increase its management role, the Service recognizes Nantucket NWR's role in providing important wildlife habitat and unique visitor services, land protection, and enhanced partnership opportunities. It is in the Service's best interest, and the best interest of the American public, that we take a more active role and see opportunities to obtain staff and funds to accomplish priority work on the refuge.

## Alternative A. Current Management

This alternative describes current refuge programs on approximately 21 acres for habitat management, fish and wildlife inventories and monitoring, administrative infrastructure and staffing, and visitor services. Although we intend this alternative to describe a "snapshot in time" of current management actions, we are including activities we have put in motion, but are not in their final, desired state. Under this alternative, TTOR would continue to provide onsite management of Nantucket NWR, and the Service would continue its passive management role and minimal presence on the refuge. We would continue discussions to pursue an updated MOU or Partnership Agreement with TTOR which would define our collaborative partnership and address resource management, visitor use and programs, additional funding sources, and their support to help contribute to refuge operations.

### Habitat Management

Our present habitat management program, while generally passive, uses the strategy of adaptive management to adjust protocols as new information becomes available. Due to the dynamic nature of coastal island habitat, the refuge is vulnerable to dramatic seasonal and annual changes. See chapter 3 for a description of the types of refuge habitat.

Under alternative A, the Service would continue to passively manage the refuge through collaboration with TTOR and other partners. The location of the refuge, and staffing and funding resources restricts our ability to maintain a consistent presence, or to actively oversee and implement management actions. Instead, we would continue to coordinate with TTOR for installing symbolic fencing and implementing beach closures to protect breeding and staging birds and seal haul-out sites on the refuge. Many of these species are under the protection of Federal laws and addressed in management guidelines, including the ESA, MMPA, and the Piping Plover and Roseate Tern Recovery Plans.

No other active wildlife or habitat management would occur. Pest species, including invasive plants and animals, would be treated only as funding and staffing permit.

Nantucket NWR is susceptible to the effects of climate change, particularly increases in sea level. For this reason, like many other refuges along the Atlantic seaboard, we completed a SLAMM analysis in 2009 that predicts potential impacts to the refuge under different sea level rise scenarios. Because those are long-term scenarios, management actions are not warranted immediately and would likely be better addressed in future CCPs. We would, however, continue to be cognizant of the indicators of climate change (e.g., sea level rise) on the refuge. In addition, the refuge would continue to work to reduce non-climate environmental stressors, including scouting for invasive species when possible, opportunistically monitoring for disease and mortality, and reducing pollution by using hybrid vehicles when possible for transportation from Sudbury for refuge visits.

### Inventories and Monitoring

Under alternative A, the Service would not regularly conduct any baseline surveys or monitoring. TTOR currently implements inventories and monitoring mandated by Federal and State guidelines, or otherwise in conjunction with closures (seal haul-out locations). We would continue to communicate and coordinate with TTOR for regular updates, and to modify existing protocols as necessary to adaptively manage the refuge.

### Visitor Services

The current level and types of visitor services would continue. The Service would maintain oversight and minimal presence, while visitor services are implemented by partners, primarily TTOR. In recent years, TTOR estimates that they have reached 40,995 day visitors per year with their organization's messaging

and information. Under current management, there are not enough resources available onsite (including staff, signs, brochures, etc.) to adequately transmit the Service's role in the partnership, and many of these visitors are unaware that the tip of Great Point is a national wildlife refuge. Some collaborative educational and interpretive programming occurs between TTOR and the Maria Mitchell Association, as well as the Massachusetts Audubon Society.

The five compatible priority uses currently allowed (fishing, wildlife photography and observation, interpretation, and environmental education) would continue to be available to the public on the refuge where beach access is permitted. Key adjacent landowners (NCF, TTOR) provide opportunities for the five priority public uses as well, though under different policies to meet their specific management and visitor services objectives. In addition, hunting is allowed on both TTOR and NCF properties, and other surrounding private properties, but due to its limited size and habitat, hunting is not allowed on the refuge.

Though we do not currently refer to the term "zone management," we do identify and apply different management approaches to different locations on the refuge. We use zone terminology here and throughout the document to illustrate referenced locations on the refuge, and to provide continuity with alternatives B and C where additional zone management is proposed. Please see map 2-1 for an illustration of refuge zones.

### Refuge Administration

In this alternative, refuge staffing would remain at current levels and would continue to be stationed at the refuge complex headquarters in Sudbury, Massachusetts. At present, we do not contribute to the maintenance of any facilities associated with the refuge, nor do we receive any of the revenue generated for permit access to the Coskata-Coatue Peninsula. TTOR and NCF maintain the gatehouse, air stations, and portable restroom facilities. The lighthouse is located on a one-acre Coast Guard inholding on the refuge, and TTOR uses and maintains the lighthouse for their visitor services under a joint agreement with them. The MOU between the Service and TTOR needs to be renewed, as they continue to provide onsite management and enforcement of the refuge and its policies.

In the discussion that follows, we describe in detail the goals, objectives, and strategies that we would implement under alternative A.

### GOAL 1.

**Perpetuate and enhance the biological integrity and diversity of coastal habitats on and around Nantucket Island to support and enhance native wildlife and plant communities with an emphasis on species of conservation concern.**

### Objective 1.1. Dune and Shoreline Habitat.

Over the next 15 years, continue the Service's minimal oversight and rely on TTOR to protect 13 acres of dune habitat and manage 7.5 acres of marine intertidal beach and beach berm along approximately 1,000 yards of shoreline to preserve biological integrity and benefit nesting piping plovers *(Charadrius melodus),* least terns *(Sternula antillarum)* and common terns *(Sterna hirundo)*, staging and migrating terns; and marine mammals.

**Rationale**

Biological integrity of dune habitat: Throughout the Atlantic coast, quality beach habitat is imperiled due to increases in human uses and development. These naturally unstable, dynamic ecosystems are subject to erosion and accretion, which is dictated by wind and wave action (MA DFG 2006). Many species rely upon these dynamic processes to provide and continually revitalize coastal habitat and food resources. Nantucket NWR and the greater Coskata-Coatue Peninsula have been identified as ACJV land and shorebird focal areas within


Nantucket National Wildlife Refuge - Comprehensive Conservation Plan
Public Use - Alternative A - Current Management
Zone 3
Usually closed due
to seals on the point.
No pedestrians, no vehicles
Zone 2
Always open subject
to wildlife and state
and federal guidelines
Zone 1
Always closed, dune restoration
Parking
Zone 1
Always closed, dune restoration
Parking
Sources:
Refuge roads, trails and
boundaries from USFWS.
Basemap 2008 NAIP imagery
0 50 100 200 300 400 Meters
0 100 200 400 600 800 1,000 1,200 Feet

BCR 30. These areas are highlighted because of their importance to a variety of priority land and shorebirds in the region and along the Atlantic Coast. Although Nantucket NWR is relatively small, its location on the landscape provides important habitat to a variety of migratory birds and marine mammals of conservation concern.

From the SLAMM analysis conducted for the refuge (Clough and Larson 2009; appendix H), we now have projected estimates of sea level increases by years 2025, 2050, and 2100 under four sea level rise scenarios, and how those scenarios might impact the refuge. Though this model was originally designed for tidal marshes and therefore may not take all factors into account for a barrier beach system like the Nantucket NWR, it at least provides an indication of what potential future impacts may arise. Because these are long-term scenarios, immediate management actions are not warranted and would likely be better addressed in future CCPs. We would, however, continue to be cognizant of the indicators of climate change (e.g., sea level rise) on the refuge. In addition, the refuge would continue to work to reduce non-climate environmental stressors, including scouting for invasive species when possible, opportunistically monitoring for disease and mortality, and reducing pollution by using hybrid vehicles for transportation from Sudbury for refuge visits.

Nesting piping plovers: The piping plover is a federally listed and State-listed threatened species. Massachusetts supports the second largest population of breeding piping plovers along the Atlantic Coast. Plovers return to Massachusetts in late March or early April and begin establishing nesting territories along dunes and beach strands. Their nesting season spans from late March through the end of August. Plovers forage along the waterline, on the mudflats, and among the wrack line (MA NHESP 1990). Habitat loss from development has decimated the piping plover along the Atlantic Coast. Predation on eggs and chicks by fox, skunk *(Mephitis mephitis),* raccoon *(Procyon lotor),* and other predators is increasing, while OSV users and other beach goers impede foraging or accidentally crush the cryptic plover eggs or chicks. Protection of critical habitat from development and restricting recreational use in plover nesting areas is essential to maintaining healthy piping plover populations (MA NHESP 1990).

Since the piping plover was federally listed in 1986 and specific management guidelines were developed in 1993 by Massachusetts and 1994 by the Service (revised in 1996), both the Service and State (MA NHESP) have worked to coordinate consistent implementation and enforcement of these guidelines on all private and public coastal landowners in the State. The Federal and Massachusetts guidelines are provided in appendix I.

TTOR has been managing piping plover habitat on the refuge since 1982 under a partnership agreement with the Service. In 2001, a Section 7 evaluation was completed to initiate management of piping plover according to the 1996 Piping Plover Federal Guidelines. Since then, TTOR has established symbolic fencing in early April, and initiated beach closures for piping plover nest protection. Piping plovers have regularly nested on Great Point and Coskata-Coatue just south of the Nantucket NWR since at least 1983 (annual nesting numbers range from 0 to 12), but very few pairs have nested on the refuge in the last 25 years. The last recorded nest was in 2006.

The Piping Plover Recovery Plan has a recovery objective of 1.5 chicks per pair on average over 5 years (USFWS 1996). Under the current level of Service participation, the land acreage, and the volume of visitors each year, it is presently uncertain if the refuge is in full compliance with all applicable laws and

guidelines for piping plovers. Under this alternative, TTOR has been maintaining symbolic fencing in some areas of piping plover habitat. The consistently low numbers of nesting pairs and variable nest success and fledging rates are cause for some concern. This may be due to any number of factors, but lack of high quality habitat, human disturbance, including OSV use, and predation are three potential factors that need further investigation.

Nesting terns: The least tern is a species of special concern in Massachusetts. In the late 1800s the least tern was a common bird in Massachusetts but was decimated at the turn of the century by the millinery trade. Since recovering, the least tern now faces threats from development, predation, and beach use. Least terns nest on beaches and sandbars with a mix of sand, pebbles and shells, and lacking in vegetation. The birds arrive in Massachusetts at nesting sites in early May. A high percentage of nests and eggs are lost each year to overwash from high tides and storm surges. Eggs and chicks suffer high predation from avian and mammalian predators including crows, gulls, raptors, coyotes *(Canis latrans),* red fox *(Vulpes vulpes),* skunk, and raccoon. Historically, Great Point (including Nantucket NWR and adjacent land to the south) has been the site of one third of Massachusetts' breeding least terns (TTOR booklet 1998). Since 1978, numbers of least tern pairs have fluctuated on Great Point, ranging from 0 in 1991, to over 1,000 in two consecutive years (1996 and 1997; USFWS undated), but many of these nests were not on Nantucket NWR. Under this alternative, prospecting least terns may benefit from the closures that TTOR implements for piping plovers.

Common terns are also a species of special concern in Massachusetts. Common terns likely numbered in the hundreds of thousands in the mid-1800s, but are much more scarce today, with approximately 15,000 pairs nesting in Massachusetts in recent years (MA NHESP 2007). Common terns nest on beaches with a mix of sand and vegetation starting in mid-May in Massachusetts. Threats to reproductive success include increasing predator populations and storms. Common terns can be found on Great Point in lower numbers, ranging from one nesting pair in the early 1980s and again in the early 1990s up to 35 nesting pairs in 1996. In 2008, one nesting pair was located at Great Point, but was predated (TTOR 2008). Under this alternative, prospecting common terns may benefit from the closures that TTOR implements for piping plovers and seals, which will also help maintain dune integrity.

*Common terns foraging on Nantucket National Wildlife Refuge*

Amanda Boyd/USFWS

Staging and migrating terns: The post-breeding dispersal period is an especially sensitive time for terns because parental care may continue well into fall migration and even after arrival at their wintering areas (Ashmole and Tovar 1968, Feare 2002, Nisbet 1976). At fledging, young terns usually have not achieved adult mass, and several studies have demonstrated that post-fledging parental care given prior to departure from their breeding colony sites provides for an increase in mass and later post-fledging survival probability (Feare 2002, Schauroth and Becker 2008, Stienen and Brenninkmeijer 2002). During the post-breeding dispersal period, young terns start to transition to independence, learning skills needed to fish independently, and increasing body condition and strength of flight muscles needed for the 7,000 kilometer (4,350 mile) migration to South America. Much of the presumed recent reduction in post-fledging to first-breeding survival likely results from events that take place during this period (Spendelow et al. 2002). After an initial period of more widespread dispersal, most (if not all) northwestern Atlantic roseate terns *(Sterna dougallii)* congregate at locations around Cape Cod and the offshore islands of Martha's Vineyard and Nantucket, Massachusetts (Gochfeld et al. 1998, Shealer and Kress 1994). Staging roseate and common terns have been recorded on Nantucket NWR beginning in mid-July, but consistent surveys have not been conducted to evaluate the importance of this site. In 2009, high counts of 600 or more staging terns were recorded in late July on Nantucket NWR and both common and roseate terns were observed from mid-July through the end of August. Under this alternative, TTOR moves or extends the fencing to protect staging terns, when their numbers are high and they are visible to the public, or when they are in or near the seal haul-out area.

Seal haul-out sites: Gray *(Halichoerus grypus)* and harbor *(Phoca vitulina)* seals are both protected under the MMPA. In recent years, the tip of Nantucket NWR has become a haul-out site for both species, especially gray seals. While their pupping grounds were historically further north on Sable Island and in the Gulf of Saint Lawrence in Canada, there has been a year-round breeding population around Cape Cod and associated islands since the late 1990s. Muskeget Island and the associated shoals supports the largest breeding population of gray seals in the United States and represents one of only two sites in Massachusetts where gray seals pup. The other site is Monomoy NWR. Though there is currently no estimate for the United States population, surveys conducted since their arrival in the 1980s indicate a steady increase in abundance in both Maine and Massachusetts, though it is unclear if this is due to population expansion or immigration (Waring et al. 2009). On Nantucket in 2008, daily counts ranged between 50 and 250 for hauled-out seals on the refuge in April and May (TTOR 2008). TTOR has been maintaining symbolic fencing at the tip of Great Point to protect the seals from disturbance and prevent potential injury to visitors that wander too close.

**Strategies**

The Service would continue to coordinate with and rely on TTOR to provide protection and management of the refuge's habitat, specifically to

- annually protect existing piping plover habitat refugewide by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through historic and suitable nesting habitat in accordance with Federal guidelines by April 1;

- annually protect common, roseate and least tern nesting habitat where it overlaps with plover habitat refugewide by preventing vehicular and pedestrian access by April 1;

- protect habitat for staging terns when it coincides with or is immediately adjacent to seal haul-out areas by maintaining symbolic fencing and preventing pedestrian and vehicular access; and

- implement closures to protect seal haul-out sites when at least 25 seals are present in the area using symbolic fencing. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines.

**Monitoring Elements**
Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success in achieving our objectives. The results may trigger adjustments to management strategies or refinement of our objectives. Examples of monitoring or surveys that are being coordinated with TTOR include:

- To maintain desired quality and characteristics of intertidal beaches and vegetated dune habitat, scout for invasive species when possible.
- Continue to monitor the beach annually and report any seal or bird mortality events in coordination with SEANET as weather, funding and time permits.
- To determine presence of piping plover, annually assess dune habitat for piping plover nesting suitability, and if found, monitor for nesting pairs.
- To determine number of nesting pairs and estimate productivity of piping plover, conduct annual surveys during the breeding season (April–August) throughout the life of the CCP.
- To determine number of nesting pairs of common, least, and roseate terns conduct annual inventories during the breeding season (June) throughout the life of the CCP.

**GOAL 2.** **Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.**

**Objective 2.1. Visitor Access**

Over the next 15 years, work with TTOR staff to provide pedestrian and OSV access to the refuge while maintaining closures that reduce disturbance to wildlife from visitors and protect suitable nesting habitat for piping plovers and other species of conservation concern. The exact location and timing of the closures is flexible to respond to the presence of wildlife. Visitors may participate in any compatible public use on the refuge in areas that are open to the public.

**Rationale**
The Service provides many public use opportunities to refuge visitors. Some activities, such as wildlife observation or fishing, are considered priority public uses because they are wildlife-dependent. These are to be facilitated by the Service when appropriate and compatible. Non-wildlife dependent public uses, such as swimming, can also be allowed as long as they are appropriate and compatible. Activities are managed both in time and space to ensure compatibility. The Service has historically allowed the public to drive and park OSVs on the refuge. In the past few years, both pedestrian and OSV closures have been instituted as necessary to protect wildlife at different times during the year. Map 2-1 depicts these areas as "Zones 1-3." Most of the closures have been managed by TTOR, with some input from Service staff.

The refuge's beach habitat is attractive to both wildlife and people. Some beach closures to vehicles and pedestrians have been necessary to minimize disturbance to wildlife. Disturbance to wildlife interferes with an animal's ability to feed, rest or breed. Expenditure of energy by wildlife to avoid disturbance

from people can impact successful reproduction, chick rearing, or the ability to obtain food and rebuild fuel supplies for a successful migration.

In recent years, TTOR has been maintaining symbolic fencing at the tip of Great Point (Zone 3) to protect grey and harbor seals from disturbance and prevent potential injury to visitors that wander too close. Symbolic fencing has been erected in early April of each year by TTOR to keep vehicles and pedestrians out of piping plover habitat (generally Zone 2). Under this alternative, common terns may benefit from these closures that TTOR implements for piping plovers, seals, and maintaining dune integrity (generally Zones 1-3). Starting in late July or early August, TTOR also moves or extends the fencing to protect staging terns, when their numbers are high and they are visible to the public, or when they are in or near the seal haul-out area (generally Zone 3). This alternative seeks to maintain this current management which includes the following strategies:

**Strategies**

- Renew MOU with TTOR to strengthen partnerships on and off Nantucket NWR, and to promote management cooperation and coordination when possible.
- Seasonally adjust closures to allow pedestrian and OSV access while minimizing disturbance to seals, plovers, and terns.
- Annually protect existing piping plover habitat refugewide (Zones 1, 2, 3) by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through historic nesting habitat in accordance with Federal guidelines by April 1.
- Protect habitat for staging terns when it coincides with seal haul-out areas (generally Zone 3) by maintaining symbolic fencing and preventing pedestrian and vehicular access.
- Implement closures to protect seal haul-out sites (generally Zone 3) when at least 25 seals are present in the area using symbolic fencing. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines.

**Monitoring Elements**

- Size, location, and timing of seasonal closures by zone.
- Number of breeding bird pairs with productivity estimates, and number of seals within closed areas.
- Number of refuge visitors engaged in priority public uses in open areas.

### Objective 2.2. Environmental Education

Maintain opportunities for environmental education programs and partnerships to communicate our knowledge and understanding of Nantucket's coastal ecosystems and the Federal trust resources that depend upon them.

**Rationale**

The Improvement Act identifies environmental education as a priority wildlife-dependent recreation activity. It promotes the understanding and appreciation of natural resources and their management on all lands and waters in the refuge system. In order to provide quality environmental education, it is extremely beneficial to have onsite personnel to develop local curriculum-based programs both on- and offsite.

Some Nantucket conservation organizations occasionally conduct environmental education programs on the refuge. It is incumbent upon the Service to ensure the continued provision of these programs on the refuge, and that internal Service priority use mandates are met. Presently, the distance of the refuge from Sudbury and levels of staffing and funding preclude the ability of refuge staff to develop and deliver programming to fulfill the Service's educational goals and priority use mandates. Therefore, under this alternative, we would continue to rely on the interest and availability of our partners in providing these programs, and as staffing and funding allow, would work with them to develop additional programs:

**Strategies**
*Continue to:*
- Rely on TTOR and other organizations (including Maria Mitchell) to conduct environmental education programs on Nantucket.
- Coordinate with partners for environmental education opportunities as staffing and funding allow.

**Monitoring Elements**
- Number of visitors reached by programs.
- Number of programs and materials produced.

### Objective 2.3. Interpretation and Public Outreach

Provide quality interpretation and outreach programs by continuing the current level of TTOR tours and identify opportunities for partnerships within the community that will increase awareness of the Service presence on Nantucket, and define how the biological resources that exist on Nantucket NWR exemplify the refuge system (as existing staff allow).

**Rationale**
Interpretation is one of the six priority public uses as defined by the Improvement Act. It provides opportunities for visitors to make their own connections to the resource, which invites participation in resource stewardship and helps refuge visitors understand their relationships to, and impacts on, those resources. Currently, the refuge's interpretive programs consist of fishing, natural history and a guided lighthouse tour by TTOR via shuttle vans.


Elizabeth Wunker/USFWS
*Wildlife observation at the refuge*

Signage on the refuge is also at a minimum; one large sign denotes the southern boundary of the refuge, and all other signs are seasonal and indicate beach closures or public use restrictions to promote wildlife and habitat conservation. At present, there are no interpretive resource signs available on the refuge. The ability of the refuge staff to provide more interpretive programs, to promote the presence and mission of the refuge, and to provide informational materials about the resources of the refuge, is restricted by current levels of staffing and funding. Under this alternative, we would continue to rely on TTOR to provide interpretive programming on or associated with the refuge.

**Strategies**
*Continue to:*
- Rely on TTOR van tours to deliver the message about wildlife conservation and the Service's role on the Coskata-Coatue Peninsula.
- Coordinate with partners for interpretation and outreach opportunities as staffing and funding allow.

**Monitoring Elements**
- Number of visitors reached by programs on and off site.
- Number of informational materials produced, signage, tours and other activities developed.

**Objective 2.4 Wildlife Observation and Photography**

Continue to provide the current level of quality, compatible opportunities for wildlife observation and photography daily for the public to enjoy and capture the refuge's wildlife and habitat diversity.

**Rationale**
The Improvement Act identifies wildlife observation and photography as priority wildlife-dependent recreation. They promote the understanding and appreciation of natural resources and their management on all lands and waters in the refuge system. Since its establishment, the refuge has provided daily opportunities for wildlife observation and photography at the refuge. Exceptions to this are when compliance with Federal wildlife and habitat protection laws requires access restrictions to some portions of the refuge.

**Strategies**
*Continue to:*
- Rely on TTOR to provide wildlife observation and photography opportunities through their tours.
- Provide daily, sunrise to sunset, access to the refuge as coordinated with and implemented by TTOR when possible.
- Coordinate with TTOR and other partners and volunteers to implement and maintain wildlife observation and photography opportunities.

**Monitoring Elements**
- Number of visitors reached by programs on and off site.
- Number of programs and materials produced.

**Objective 2.5. Fishing**

Continue to provide the current level of quality, compatible experiences when possible for those who come to the refuge for its unique fishing opportunities.

**Rationale**
The Improvement Act identifies fishing as a priority wildlife-dependent recreation. It states, "Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System." We recognize fishing as a healthy, traditional outdoor pastime. It, too, promotes public understanding and appreciation of natural resources and their management on all lands and waters in the refuge system.

We have provided for recreational fishing access along the beach since the refuge was established in 1973. We would continue to provide recreational fishing opportunities in coordination with TTOR as they manage and monitor

the Coskata-Coatue Peninsula and provide public fishing tours on and adjacent to the refuge. TTOR and NCF provide the only point-of-contact on the peninsula at the gatehouse. Although no refuge fees are associated with this public fishing opportunity, we require anglers to comply with State regulations which include obtaining a State fishing license.

Under this alternative, we would continue to coordinate with TTOR and provide passive Service oversight to ensure the protection of Federal trust resources, and also allow access to the beach for recreation when compatible. We would conduct compatibility determinations for their fishing tours and provide TTOR with special use permits so that the continuation of these programs are in accordance with Service guidelines. Present staffing and funding conditions do not ensure, however, that the existing levels of use and daily activities comply with Federal, State, and local endangered species or dune protection laws.

**Strategies**
*Continue to:*
- Rely on TTOR for their current level of tours and other fishing events and activities.

- Allow diurnal and nocturnal fishing at the refuge as coordinated with and implemented by TTOR.

**Monitoring Elements**
- Number of anglers.

- Number of fishing tours conducted.

**GOAL 3.** **Perpetuate and enhance long-term conservation and management of wildlife resources on and around Nantucket Island through partnerships and land protection with public and private landowners, Federal, State, and local entities.**

**Objective 3.1. Protecting Land**

Working with partners, evaluate opportunities to protect important wildlife habitat within Nantucket County as the Service is notified of availabilities in Federal excess properties, and as funding and staffing allow.

**Rationale**
Nantucket NWR was established for its benefit as a wildlife sanctuary for migratory birds. Migratory birds utilize the refuges in the complex and other adjacent refuges as stepping stones along the Atlantic Flyway. Regional national wildlife refuges including Monomoy, Nomans Land Island, Nantucket, Block Island, and Stewart B. McKinney work in concert to provide important stopover habitat for shorebirds, wading birds, neotropical migrants, and other birds. As coastal areas change due to erosion, storms, climate change and sea level rise, preserving these and other important wildlife habitat areas become critical for their lifecycles. The ability of the Nantucket NWR to meet its purpose is currently limited by its small area and popularity as a tourist and fishing destination. Under the current alternative, we would only consider other land acquisition of excess Federal properties if they met a conservation or management need.

**Strategies**
*Evaluate land acquisition opportunities in cooperation with partners as the Service is notified of availabilities of excess Federal properties in the future.*

**Monitoring Elements**
- Number of acres protected through easement or acquisition.

- Number of new sites protected.

## Alternative B. Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative)

Alternative B is the alternative our planning team proposes to recommend to our Regional Director for implementation. It includes an array of management actions that, in our professional judgment, work best towards achieving the refuge's purposes, the vision and goals, and would make an important contribution to conserving Federal trust resources of concern in coastal southern New England. This alternative provides the most appropriate level and type of management for Service staff managing the eight refuges in the complex, given the relatively modest increase in staff and funding that is anticipated over the next 15 years. Therefore, we believe this is the most reasonable, feasible, and practicable alternative and is achievable within the 15-year timeframe.

This alternative describes an expansion of current management in all areas over the next 15 years on the approximately 21 existing acres. The Service has identified an additional 1,790 acres of land for acquisition and/or easement, as funding and staffing levels permit. Additionally, it strives to provide a balance between habitat management and species conservation with public use and access. We would increase our presence on the refuge to both implement and monitor habitat management actions, and provide more quality opportunities for the five priority public uses currently allowed. We would also seek to enhance our current, and to create new, partnerships with local conservation organizations and civic groups. Under alternative B, we would continue our adaptive management approach of modifying actions based on new information, especially with shifting coastal habitat, and with a constant effort to collect more and better data upon which to make management decisions. We would actively pursue an updated MOU or Partnership Agreement with TTOR which addresses resource management, visitor use, and additional funding sources and support to contribute to operations and staffing on the refuge. Chapter 3 presents the types of habitat on the refuge and surrounding lands on Nantucket.

### Habitat Management and Protection

Under this alternative, the Service would take a more active role in habitat and species management both on and off the refuge through partnerships and as facilitated by implementing the North Atlantic LCC (see chapter 3). This includes expanding the Nantucket NWR to include additional lands on Nantucket Island and associated islands identified by the Service totaling 1,790 acres. Our highest priority would be the protection of dynamic coastal beach and dune systems and the focal avian and mammalian species that rely on them for critical nesting, resting, foraging, and staging habitat. This would include identifying and symbolically fencing important wildlife habitat, and evaluating vehicle and pedestrian access routes on the refuge by no later than April 1 annually to avoid and minimize adverse impacts to sensitive beach and dune ecosystems for beach-nesting birds. This would be an adaptive management process that would be subject to change within a given season or from year to year based on changing beach dynamics and species presence. The result could mean access restrictions and/or closures in some seasons and/or years (see Zone Management section and maps 2-1, 2-2, 2-3). We would also evaluate the need for dune restoration and monitor for invasive species and treat them as staffing and funding permit.

Species management would follow Federal piping plover recovery guidelines and State plover and tern guidelines, and this would benefit other species such as nesting American oystercatchers *(Haematopus palliates)*. We would provide protection for staging terns by protecting additional habitat in the late summer/early fall from vehicular and pedestrian disturbance independent of seal presence. Predator control measures would be employed as necessary to support declining populations of piping plovers, and least, common, and roseate terns potentially nesting on the refuge. We would continue to work closely with TTOR, NCF, and our other partners to accomplish these management actions with an emphasis on the larger landscape level conservation and more consistent management between partners on the peninsula.

Additionally, we would work with partners on partner lands to survey, monitor, and conduct habitat evaluations for New England cottontail on Nantucket, and to assess the feasibility of a New England cottontail release on suitable properties. The Service's New England Field Office would be able to provide leadership and technical expertise as they have overseen New England cottontail monitoring and management throughout the Northeast.

Although we are not able to predict the extent of future acquisitions within the next 15 years, the Service would make a concerted effort to pursue Federal (surplus) land, including the former Coast Guard LORAN and FAA facilities, as well as easements and acquisitions on key parcels on the Coskata-Coatue Peninsula, and on Muskeget and/or Tuckernuck Islands to further this landscape level conservation approach.

**Inventories and Monitoring**

The Service would conduct monitoring and inventory efforts to provide key information on the trust resources as long as we have the necessary resources to accomplish them. Primarily, the focus would be on piping plover and nesting and/or staging least, common and roseate terns. Monitoring of seals on the refuge would be included as well. We would target any alterations or additions to these on-going surveys toward helping us understand better the implications of public use, climate change, our management actions, and ways to improve our efficiency and effectiveness. We would continue to work closely with TTOR and our other conservation partners to conduct these inventories and surveys.

**Visitor Services**

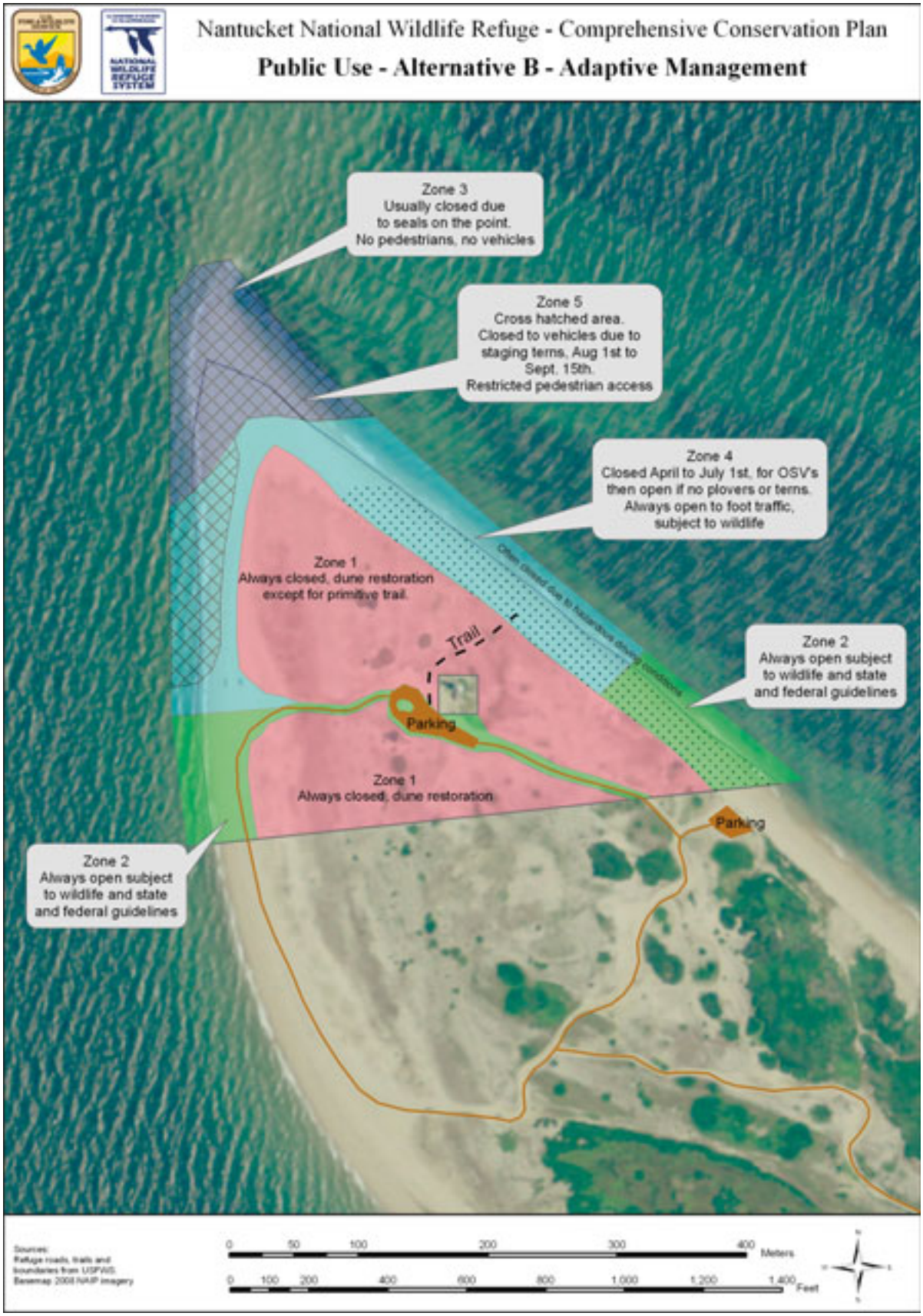
Under alternative B, we would expand existing opportunities for these five priority public uses, with an emphasis on fishing and interpretation.

We would seek to increase our participation in the visitor services programming associated with the refuge, by working with current partners and seeking new partners to help us achieve new and expanded environmental education and interpretation programs. We would continue to work with TTOR to adaptively manage refuge zones to allow for compatible public recreation through travel corridors and fenced closure areas (map 2-2), and to provide distributional materials on refuge wildlife and habitats, and conservation in the region. Closures would be continuously updated on the refuge Web site. The Service would collaborate with partners to sponsor and participate in additional outreach opportunities for visitors and residents of Nantucket, including fishing events. Offsite messaging (such as brochures and a kiosk at the gatehouse and some web page upgrades) would improve visitor awareness of habitat issues, and encourage environmentally friendly access. We would also seek alternative transportation study funds to determine the feasibility of implementing a system to transport more people to the refuge without the use of individual vehicles.

We propose a primitive foot trail from the lighthouse to the refuge's eastern beach for pedestrian and fishing access. We would convey Service policy to focus on maintaining and re-establishing native vegetation that historically occurred as well as stewarding the health and integrity of the dynamic beach habitats on the refuge within the landscape scale and context. Another interpretive message would be the significance of the peninsula's proposed National Natural Landmark designation, and how the partners are preserving those qualities through low profile facilities and minimal administrative signs.

**Refuge Administration**

This alternative proposes that we achieve a level of staffing that meets the minimum requirements for a refuge complex of this size and importance by adding 1.5 positions to the refuge: a half-time, year round visitor services specialist and a full-time biologist. Also providing significant assistance to


Nantucket National Wildlife Refuge - Comprehensive Conservation Plan
Public Use - Alternative B - Adaptive Management
Zone 3
Usually closed due to seals on the point. No pedestrians, no vehicles
Zone 5
Cross hatched area. Closed to vehicles due to staging terns, Aug 1st to Sept. 15th. Restricted pedestrian access
Zone 4
Closed April to July 1st, for OSV's then open if no plovers or terns. Always open to foot traffic, subject to wildlife
Zone 1
Always closed, dune restoration except for primitive trail.
Trail
Parking
Zone 2
Always open subject to wildlife and state and federal guidelines
Zone 1
Always closed, dune restoration
Parking
Zone 2
Always open subject to wildlife and state and federal guidelines
Meters
Feet

Nantucket NWR will be a new law enforcement officer that would be stationed at Monomoy Refuge in Chatham. This officer would conduct regular patrols of all Cape Cod and island refuges. We would base any increases in staffing on available, permanent sources of funding, and would consider them in the context of regional and refuge priorities.

The Service would seek to partner with TTOR and NCF to establish a shared visitor contact facility. Our options include constructing a new building at the gatehouse, retrofitting a building already in use by TTOR or NCF, or purchasing a building. Development of a partnership facility and visitor contact station at a strategic location would allow the Service to better fulfill its mission and additionally provide refuge staff with an office, housing, and storage. For any site chosen, additional NEPA analysis would be required. Further, we would install a kiosk at the Wauwinet gatehouse, and use signs to highlight the conservation partnership on the Coskata-Coatue Peninsula with TTOR and NCF. We would also strive to increase visibility and awareness of Service and refuge policies, and help educate visitors about fish and wildlife and its conservation. Through our collaboration with TTOR and NCF, we would strive to achieve near-seamless management across the three properties on the peninsula; however, the Service's year-round ban on dogs on the refuge would remain unchanged. Signage throughout the refuge would be augmented to include interpretive panels and these would need to be updated and maintained. Any signage or additional infrastructure placed on or off the refuge would be with the intention of maintaining the aesthetics of the property and Nantucket Island.

The section that follows describes in detail the goals, objectives, and strategies that we would implement in alternative B.

**GOAL 1.** **Perpetuate and enhance the biological integrity and diversity of coastal habitats on and around Nantucket Island to support and enhance native wildlife and plant communities, with an emphasis on species of conservation concern.**

**Objective 1.1. Dune and Shoreline Habitat.**

Over the next 15 years, work cooperatively with partners (TTOR, NCF, Massachusetts Audubon Society) to protect from disturbance and degradation, approximately 21 acres of marine intertidal beach, beach berm, and dune habitat to preserve biological integrity and to benefit: nesting piping plovers, least terns and common terns, staging and migrating terns, migrating shorebirds, and marine mammals. Through seasonal closures, predator management, and public education, maintain a minimum productivity of 1.5 chicks per nesting pair of piping plovers and 1.0 chicks per nesting pair of terns over a 5-year period. Maintain approximately 4.4 acres of intertidal beach habitat with a public viewing distance of 50 yards to benefit migrating shorebirds, staging terns, and seals by regulating and directing public use to less sensitive areas especially during peak times of use (late summer and early fall for shorebirds and terns).

**Rationale**

Biological integrity of dune and shoreline habitat: Throughout the Atlantic coast, quality beach habitat is imperiled due to increases in human uses and development. These naturally unstable, dynamic ecosystems are subject to erosion and accretion, which is dictated by wind and wave action (MA DFG 2006). Many species rely upon these dynamic processes to provide and continually revitalize coastal habitat and food resources. Despite their importance, human modification through beach stabilization, development, and recreational use interrupt these natural processes and result in greater risk to human coastal populations, and a reduction in quality habitat available for wildlife (CBTF 1992, USFWS 1996). According to the Coastal Barriers Task Force (1992), factors

including population growth in coastal areas, and increases in affluence, leisure time, motorized vehicles, accessibility, and recreational diversity have lead to a greater intensity in human use, development, and modification of coastal resources since World War II. These uses are the greatest threats to coastal habitats because of the subsequent alterations that result (MA DFG 2006). The refuge has the opportunity and responsibility to protect and maintain these important coastal hydrogeomorphological dynamics to maintain coastal dunes and shoreline processes that provide habitat for declining wildlife species.

Birds depending on these coastal beach habitats are some of the fastest declining bird groups because of the habitat loss and degradation of these key waterfront areas. Hence, several national bird conservation organizations and Federal and State agencies advocate management to benefit beach nesting birds in such plans as the PIF Physiographic Area 09 Plan, the BCR 30 plan, and the MA CWCS. In fact, in these plans, coastal habitats contain the most species ranked as highest or high priority species of conservation concern in the region (Steinkamp 2008). Nantucket NWR and the greater Coskata-Coatue Peninsula have been identified as ACJV land and shorebird focal areas within BCR 30 because of its relative importance in the region and along the Atlantic Coast. Although Nantucket NWR is relatively small, its location on the landscape provides important habitat to a variety of migratory birds and marine mammals of conservation concern. Priority species of conservation concern listed in these plans that have been documented on the refuge include piping plover, American oystercatcher, roseate terns, least terns, and common terns. Nantucket NWR may also provide habitat for migrating shorebirds, but this has not been evaluated yet.

Though bird species make up the visibly predominant taxonomic group on the refuge, and act as indicators of habitat quality, other protected species use the refuge and adjacent lands as well. The Coskata-Coatue Peninsula is listed as one of MA NHESP's BioMap Core Habitats. This is because of the extensive maritime dune community that supports rare plant species including the prickly pear cactus, the globally rare seabeach knotweed, American sea-blite, and historically seabeach amaranth.

Clearly the refuge beach and dune ecosystem provides vital habitat for regional and local species of conservation concern amidst a declining trend in this habitat availability throughout the Atlantic Coast. While habitat protection is an important component of the conservation of priority species, other factors, such as human disturbance, can contribute to declines in available habitat or nesting success and productivity. It is widely acknowledged by Federal, State, and local governments that coastal ecosystems may be adversely impacted by vehicles through the churning of tires, substrate compaction, vegetation destruction, and the destabilization of dunes (Town of Nantucket 2005, Massachusetts General Laws Chapter 131, S 40; 310 Code of Massachusetts Regulations 10, specifically the Barriers Beaches Management 310 Code of Massachusetts Regulations 10.29, Leatherman and Godfrey 1979). In addition, pedestrians, dogs, fireworks, and other human recreational activities including kite-flying, can have adverse impacts on beach-dependent species.

The increase in staffing under this alternative for biological programs will enable the Service to take the lead in working with partners to manage Nantucket NWR to optimize benefits for habitat and wildlife. The Service's more proactive role will include more site visits, especially during the critical wildlife nesting and migration seasons through additional biological, visitor services, and law enforcement positions. The Service would ensure that the refuge is managed to comply with both State dune and wetland protection laws and guidelines and

in compliance with other Service mandates including biological integrity and SHC. This process is also focused on minimizing adverse impacts to sensitive dune habitat by restricting OSV and pedestrian access to certain areas, and redirecting traffic as conditions warrant. It is also important to note that, although our objective statements focus on birds of priority conservation concern identified in regional and State plans, we are also striving through our management to "keep common birds common."

Based on the results of SLAMM analysis, we know that this habitat is subject to loss under sea level rise scenarios over the next century. Given that these are long-term scenarios, immediate action is not warranted; therefore within the context of this CCP over the next fifteen years, we would continue to reduce non-climate environmental stressors as described in alternative A. In addition, under alternative B, we would monitor and evaluate shoreline conditions relative to climate change and sea level rise using aerial photos, cooperate with the State on their climate change priorities once refined, and utilize the North Atlantic LCC to facilitate climate change research, education, and collaboration.

Nesting piping plovers: The rationale associated with alternative A discusses piping plover ecology in Massachusetts and limiting factors to reproductive success and population growth. Piping plovers have most recently suffered from degradation and loss of coastal habitat as a result of increased human modification and use (USFWS 1996). Piping plover recovery is often in conflict with human recreation, because they both utilize the area above the high tide line on coastal beaches. To mitigate these conflicts, piping plover recovery guidelines stipulate that suitable habitat on public beaches be delineated with symbolic fencing and signs prior to April 1 each year, and that a 50-meter radius be maintained around nests, above high tide line where possible, to minimize disturbance to nesting birds (USFWS 1996). Because of the highly dynamic nature of the timing, abundance, and distribution of these birds on the refuge, vehicular and pedestrian access needs to be assessed in real time as changing circumstances warrant.

Gene Nieminen/USFWS

*Piping plover*

Under this alternative, all of Nantucket NWR would be managed according to Federal and State guidelines and this may require additional closures than those described in alternative A. Nesting piping plover numbers are consistently low on Nantucket NWR. We would target a minimum of two nesting pairs per breeding season, but this target may change as habitat increases or decreases naturally through sediment deposition, erosion, and storm overwash events. We would additionally maintain a 5 year average productivity level of 1.5 fledged chicks per pair in order to meet and sustain rangewide population goals. Additional monitoring of potential impacts of predators and OSV will guide future management decisions.

Nesting terns: The rationale associated with alternative A discusses breeding tern ecology in Massachusetts. Under current management, prospecting terns may benefit from closures established for piping plovers. Under alternative B, we would protect additional high quality habitat for terns by directing public use away from sensitive areas during critical times. We would also more closely monitor nesting attempts and causes of nest failure.

Staging and migrating terns: The rationale associated with alternative A discusses staging and migrating tern ecology in Massachusetts. Under alternative B, the Service proposes proactive establishment of a seasonal closure to vehicles and pedestrians to protect additional habitat for staging terns. Currently, we are unsure of the relative importance of Nantucket NWR to staging terns and we have not evaluated potential disturbances. In alternative B, we would begin staging tern surveys and begin to quantify disturbance impacts. We would work with partners to ensure that refuge data could be incorporated in larger landscape studies.

Migrating shorebirds: Many species of shorebirds *(Charadrii)* that breed in North America migrate up to 30,000 kilometers (over 18,000 miles) annually, traveling from non-breeding grounds as far south as Argentina to breeding grounds as far north as the Arctic Ocean (Brown et al. 2001, Morrison 1984, Myers et al. 1987). During these long distance migrations, shorebirds rely on strategically located stopover sites which provide abundant food and adjacent resting habitat (Helmers 1992, Myers et al. 1987, Senner & Howe 1984). Coastal stopover sites in particular are increasingly being subjected to development and human disturbance, and loss of suitable stopover habitat may contribute to declines in local abundance and overall populations of shorebirds in North America (Brown et al. 2001, Myers et al. 1987, Pfister et al. 1992). In the northeastern United States (Maine to Virginia) "77 percent of the region's human population resides along the coast" (Crossett et al. 2004). Thus, this region is one of the most heavily populated areas in North America and the U.S. Shorebird Conservation Plan has noted the importance of reducing disturbance to migrating shorebirds at key stopover sites in this region (Brown et al. 2001). The importance of Nantucket NWR to migrating shorebirds is currently unknown, but it is likely that Nantucket NWR in conjunction with Coskata-Coatue provides important stopover habitat. Migrating shorebirds will likely benefit from the closures that are established for seals and staging terns and use will be monitored in conjunction with other biological work.

Seal haul-out sites: Same as alternative A.

**Strategies**

*Continue to:*

- Implement closures to protect seal haul-out sites using symbolic fencing when at least 25 seals are present in the area. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines.

- Coordinate with National Marine Fisheries Service and other organizations to protect seals.

*Within 1 year:*

- Establish a seasonal closure to vehicles and pedestrians on the northwest tip of the refuge where staging terns have occurred in recent years. This closure will generally be from August 1 to September 15. We will use the principles of adaptive management to determine if closures are warranted, where, and for what period of time. Generally, location will be dependent on shifting habitat suitability and bird use and dates of closures will be dependent on nesting and migration chronology. We will use adaptive management to determine management regimes and decisions that result from monitoring. Closure dates and locations will be correlated with staging tern use so that the effectiveness of the closures can be assessed and modifications made to protect birds while minimizing restrictions to refuge visitors.

- Control invasive species throughout the refuge when possible.

- Annually protect existing piping plover habitat refugewide by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through historic nesting habitat in accordance with Federal guidelines by April 1. Additionally prohibit vehicle access in on most of the beach from April 1 to at least July 1, or until nesting piping plovers have fledged chicks.

- If piping plover chicks hatch, maintain a vehicle-free area extending 1,000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. Closures in areas with piping plover chicks remain in effect until chicks are at least 35 days old, or capable of at least 15 meters of sustained flight.

- If no territorial piping plovers have established by July 1, and areas are not part of other zoning closures (see below), then areas may be opened for vehicular and/or pedestrian access.

- Annually protect common and least tern nesting habitat refugewide by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through suitable habitat by May 15 and until at least July 1. If terns are not established by this date, access restrictions may be lifted. Maintain a buffer of 50 meters around nesting areas.

- When unfledged least tern chicks are present, vehicle closures will be enforced to provide a 100-yard buffer perpendicular to the long axis of the beach, from the perimeter of the colony. Closures are in effect until terns are observed to be capable of flight.

*Within 5 years:*

- Maintain a year round closure in the beach dune habitat, with the exception of a pedestrian access trail from the lighthouse to the east beach, to protect dune ecosystem integrity.

*Staging tern habitat on northwest tip of the refuge*

Elizabeth Wunker/USFWS

- Conduct beach plantings or otherwise restore dune trampling resulting from trespass in the dune habitat.

- Determine impacts of predators (feral cats, rats, gulls, and others) to nesting piping plovers and terns, and implement predator control (lethal and non-lethal) if necessary.

- Collaborate with partners to initiate a study of staging terns to determine the relative importance of Nantucket NWR and quantify potential disturbance impacts. Work with partners to ensure that data can be incorporated in larger landscape studies. Implement additional beach management /fencing where scientific data exist to demonstrate the need for any changes in management.

- Migrating shorebirds may benefit from closures for staging terns and seals, thus, conduct periodic surveys for these species in conjunction with other biological work.

- Conduct research to fill data gaps. Potential research includes importance of Nantucket NWR to migratory shorebirds and bats, seals and impacts of recreational use to nesting and migrating birds.

**Monitoring Elements**
Conduct appropriate monitoring and survey programs as funding and staffing permits to measure our success in achieving our objectives. The results may trigger adjustments to management strategies or refinement of our objectives. Examples of monitoring or surveys that are likely to occur include:

- Conduct survey for seabeach amaranth and evaluate potential for introduction refugewide.

- To determine species composition of native plant community, conduct refugewide vegetative survey, especially to identify any rare plants.

- To maintain desired quality and characteristics of intertidal beaches and vegetated dune habitat, annually scout for invasive species.

- Monitor the intertidal zone and shoreline erosion rate through aerial photos of critical habitats for nesting and migrating shorebirds to evaluate the potential for abatement. Review SLAMM analysis periodically. Establish long-term hydrogeomorphological monitoring to assess change from natural processes, climate (sea level rise), and OSV use.

- Continue to monitor the beach annually and report any seal or bird mortality events in coordination with SEANET as weather, funding, and time permits.

- To determine potential for piping plovers, annually assess dune habitat for piping plover nesting suitability, and if found, monitor for nesting pairs.

- Conduct annual surveys for piping plovers during the breeding season (April – August) throughout the life of the CCP and monitor productivity according to State and Federal recommendations.

- To determine number of nesting pairs of common, least, and roseate terns conduct annual surveys during the breeding season (June) throughout the life of the CCP and annually monitor productivity according to State and Federal recommendations.

- To determine importance to nesting American oystercatchers and migrating shorebirds, conduct surveys periodically. Nesting American oystercatchers may benefit from closures for piping plovers and terns, thus, conduct annual survey for this species and monitor nest success in conjunction with other biological work.

- To document the importance of Nantucket NWR to staging terns, conduct systematic surveys of tern use from during pre and post-breeding times and participate in large scale study of anthropogenic disturbances.

- To document the importance of Nantucket NWR to seals, conduct systematic counts of seal haul-outs as time permits.

**Objective 1.2. Landscape-level Conservation**

Over the next 15 years, upon the invitation of other conservation landowners, work cooperatively on partner lands, including TTOR, NCF, Massachusetts Audubon Society to protect from disturbance and degradation marine intertidal beach, beach berm, and dune habitat to preserve biological integrity and benefit breeding and staging birds and marine mammals. When staff is available, up to 25 percent of staff time may be dedicated to habitat management, wildlife management, and inventory and monitoring on partner lands in support of focal species.

**Rationale**

The Nantucket NWR is not the only area with significant coastal bird and marine mammal resources. Our conservation efforts and our ability to balance wildlife protection and public use would be enhanced if we share our expertise and staff resources and work at the invitation of other conservation partners on their lands to benefit habitat and wildlife. Conservation efforts both on and off the refuge would be facilitated through the implementation of the Service's North Atlantic LCC. This is an effort to promote regional partnerships to address resource management issues, share latest scientific information, and integrate conservation efforts. Under this alternative, we would endeavor to collaborate with partners for resource management on and off the refuge, encourage and participate in research on and off the refuge on coastal resources of concern and/or the importance of coastal islands for migrating taxa, share latest scientific findings, and become better integrated with the Nantucket and Cape Cod scientific community.

Under this alternative, we would also work with partners on partner lands to survey, monitor, evaluate habitat and explore the option of releasing New England cottontail *(Sylvilagus transitionalis)* on suitable properties. New England cottontail is a candidate species under consideration for Federal listing under the ESA due to population declines. This species is particularly suited to shrubland habitats and is geographically restricted to the northeast. New England cottontails were known to historically occur on Nantucket and Martha's Vineyard, but with the introduction of eastern cottontails in the late-1800s and early 1900s, along with other factors, are now considered extirpated from these islands.

Current populations of New England cottontails on Cape Cod are genetically distinct from other known populations and as such should be managed as a distinct unit. These populations exist in an area with tremendous anthropogenic influences, competition from non-native eastern cottontails *(Sylvilagus floridanus),* mammalian predation, and loss of habitat from succession. While densities of New England cottontails in coastal scrub communities have not been assessed, densities of one to two cottontails per acre (target densities for the Region are 1.5 cottontail per acre) is a reasonable estimate (A. Tur, personal

communication, 2010). The decision to release New England cottontails would depend on the amount and connectivity of available habitat.

In the last several years, efforts throughout New England have been made to locate remnant New England cottontail populations, and to fill in knowledge gaps about their home ranges, habitat requirements, genetic diversity, and population dynamics. Despite these efforts, there is still much that remains unknown about the ecology of the species. This includes evaluating similar introductions on coastal islands, evaluating the genetic viability of a population on portions of Nantucket, the feasibility of New England cottontail management over time, and assessing the impact of such an introduction on other rare or sensitive species located on potential release sites. Coordination has already begun with State and Federal experts to make the New England cottontail a regional priority, and the Service's New England Field Office would be able to provide leadership and technical expertise in making these determinations.

**Strategies**

- Provide assistance to symbolically fence suitable habitat on partner lands.
- Provide assistance to conduct inventory and monitoring actions on partner lands.
- Provide assistance in surveying, monitoring, and conducting habitat evaluations for New England cottontail on partner properties. With partners, determine appropriateness and feasibility of a New England cottontail release on suitable sites.
- Participate in Nantucket shorebird meetings.
- Conduct research to fill data gaps. Potential research includes importance of conservation lands on Nantucket to migratory shorebirds and bats, seals and impacts of recreational use to nesting and migrating birds.
- Determine impacts of predators (feral cats, rats, gulls, and others) to nesting piping plovers and terns, and implement predator control (lethal and non-lethal) if necessary.

**Monitoring Elements**

- Number of acres protected by string fencing.
- Number of Nantucket shorebird meetings attended.
- Number of partnerships resulting in research and management actions for New England cottontail, shorebirds, and seabirds.

**GOAL 2.** **Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.**

**Objective 2.1. Visitor Access**

Over the next 15 years, utilize a system of zone management to provide pedestrian and/or OSV access to at least some portions of the refuge while maintaining closures that reduce disturbance to wildlife from visitors. Zones will be used to delineate and protect areas of suitable habitat for breeding and staging birds, as well as hauled-out seals. Flexibility in maintaining zone closures will be incorporated if, after a specified period of time, no species of concern are present; in general, at least some portion of the refuge will be closed between

April 1 and September 15. Visitors may participate in any compatible public use on the refuge in areas that are open to the public.

**Rationale**
The public generally accesses the refuge by individually owned or rented OSVs. Some visitors are transported to the refuge by TTOR as part of a natural history, lighthouse, or fishing tour. Under this alternative, the Service would strive to manage a compatible balance between wildlife and habitat protection and visitor use and OSV access. This would include evaluating visitor use and traffic patterns on the refuge to direct OSV traffic to less sensitive areas and around nesting and/or migrating wildlife to avoid and minimize adverse impacts or conflicts. Given the dynamic nature of coastal ecosystems and the variability in wildlife presence, abundance, and distribution on the Coskata-Coatue Peninsula, we would continue to use an adaptive management approach to provide conservation measures and allow public access.

The Service proposes a zone system to manage both pedestrian and vehicular use by time and by location. In the past few years, both pedestrian and OSV closures have been instituted as necessary to protect wildlife at different times during the year. We propose to maintain and refine existing closures to ensure compliance with plover and tern guidelines and to increase nesting success for plovers and terns. Map 2-2 depicts these areas known as "Zones 1-5." Closures would be regularly updated on our refuge Web site.

Under this alternative, we will also pursue opportunities to identify alternative ways that the public can access the refuge including an additional trail and alternatives to individually driven vehicles. Lastly, we will propose to actively pursue an updated MOU or Partnership Agreement with TTOR which addresses resource management, visitor use, and additional funding sources and support to help support refuge operations.

Refuge visitors need to access the refuge by vehicles to fish, observe, photograph, and learn about wildlife, as well as enjoy the beach. Most of this access is by individual OSV use. The Service has a responsibility to manage both pedestrian and vehicular use needs to minimize disturbance to wildlife, as described above in goal 1 and chapter 1. At the same time, we strive to provide quality opportunities for visitors to learn about and enjoy refuge resources. The Service also has a responsibility to promote and provide compatible and appropriate wildlife-dependent visitor use.

**Strategies**
*Within 1 year:*
- Revise and update the existing partnership agreement with TTOR to strengthen partnerships on and off the refuge.

- Provide up-to-date, accurate information about visitor access opportunities and seasonal closures in an understandable way on the web and through handouts available at the Wauwinet Gatehouse, and other information distribution mechanisms.

- Manage pedestrian and vehicle access as shown in map 2-2 for the purpose of wildlife protection in goal 1.

*Within 3 years:*
- Apply for alternative transportation study funding to determine feasible access alternatives to the refuge with the goal of reducing the number of individually operated OSVs travelling to the refuge.

- Develop procedures for increasing and sharing of revenues and management responsibilities between the three conservation partners on the Coskata-Coatue Peninsula.

*Within 5 years:*
- Establish a pedestrian access trail from the lighthouse to the east beach in Zone 1 to provide pedestrian access to the beach and to protect dune ecosystem integrity.

- Engage the public in the alternative transportation system process so they can provide suggestions for transportation options and review of draft alternative transportation proposals.

*Within 10 years:*
- Obtain funds to implement preferred alternative transportation options.

**Monitoring Elements**
- Number of refuge visitors engaged in priority public uses.

- Number of alternative transportation trips.

- Amount and timing of seasonal closures by zone.

- Size and productivity of bird and seal populations within closed areas.

### Objective 2.2. Environmental Education

Over the next 15 years, work with partners to develop and implement a quality environmental education program, based on existing curricula, and activities to highlight the benefit of landscape-level management, and to further communicate our knowledge and understanding of Nantucket's coastal ecosystems and the migratory birds, marine mammals, and endangered and threatened species that depend upon them.

**Rationale**
The Improvement Act identifies environmental education as priority wildlife-dependent recreation. It teaches students the history and importance of conservation and ecological principals and scientific knowledge of our Nation's natural resources. Through that process, we can help develop a citizenry that has the awareness, knowledge, attitudes, skills, motivation, and commitment to work cooperatively toward the conservation of our Nation's environmental resources.

Currently, complex staffing and funding levels preclude more active programming and presence by the Service on the refuge. Under this alternative, we would be able to support current endeavors provided by our partners and expand all of our visitor services capabilities with the addition of onsite visitor services staff. This would include environmental education programming in coordination with partners that incorporates education about the refuge, its role in the refuge system, and management actions in the context of local and regional conservation issues. We would continue to work with TTOR, NCF, Maria Mitchell Association, other conservation partners, and local schools to develop programs in compliance with national and State curriculum guidelines. Environmental education incorporates onsite and offsite programs and activities that address the audience's course of study, refuge purposes, physical attributes, ecosystem dynamics, conservation strategies, and the refuge system mission. We would work within this framework to evaluate and address needs throughout the

*Refuge visitors observing closed bird nesting area*

Amanda Boyd/USFWS

community to provide workshops, field trips, day camps, and other outdoor education opportunities.

**Strategies**
*In addition to those listed under alternative A (objective 2.1):*

*Within 1 year:*
- Provide resources and information upon request from partners and local organizations who conduct a coordinated environmental education program that highlights a landscape level conservation approach as well as on the refuge.

*Within 5 years:*
- Coordinate with partners to refine an existing environmental education curriculum that highlights the importance of a landscape-level approach to resource management, to be provided both on and off the refuge, upon request.

**Monitoring Elements**
- Number of visitors reached by programs.
- Number of programs and materials produced.

### Objective 2.3. Interpretation and Public Outreach

Over the next 15 years, provide quality interpretation and outreach programs by providing enhanced and increased tours of the Coskata-Coatue Peninsula, identify additional opportunities for partnerships within the community that increase awareness of the Service presence on Nantucket and define how the biological resources on Nantucket NWR contribute to the National Wildlife Refuge System.

**Rationale**
The Improvement Act identifies interpretation as one of the six priority wildlife-dependent recreation uses. Interpretation is one of the most important ways to increase visitor awareness of the Service's role in the partnership on the Coskata-Coatue Peninsula. Interpretation can help visitors understand the habitat on the peninsula and in the water, the geological dynamics of the refuge, the importance of endangered species, and the mission of the refuge system. Interpretation programs can provide visitors with an understanding and appreciation of fish and wildlife ecology and help people understand their own role in the environment.

New Service policy in 605 FW 7 defines interpretive programs as management tools to accomplish the following:

- Provide opportunities for visitors to become interested in, learn about, and understand natural and cultural resource management and our fish and wildlife conservation history.
- Help visitors understand their role within the natural world.
- Communicate rules and regulations to visitors, thereby promoting understanding and compliance to solve or prevent potential management problems.
- Help us make management decisions and build visitor support by providing insight into management practices.
- Help visitors enjoy quality wildlife experiences on the refuge.

Further, the new policy provides these guiding principles for interpretive programs:

- Relate what is being displayed or described to something within the personality or experience of the visitor…provide meaningful context.
- Reveal key themes and concepts to visitors based on information.
- Inspire and develop curiosity.
- Relate enough of the story to introduce concepts and ideas and pique visitor interest, discussion, and investigation so that visitors will develop their own conclusions.
- Organize activities around theme statements.

Under this alternative, the addition of visitor services staff onsite would allow us to ensure our own compliance with internal mandates and public use policies. In addition, we would be able to provide additional interpretive programs on the refuge to complement and enhance partner programs. The onsite visitor services staff would assist in expanding our interpretive capabilities by designing brochures and rack cards, updating the Web site as needed and continuing to work with partners to offer quality programs. Highlighting the partnership on the Coskata-Coatue Peninsula, and increasing the Service's role in that partnership is a priority, and to accomplish this we would install a kiosk at the gatehouse, and interpretive panels at the gatehouse and lighthouse. All structural additions to the refuge would be consistent with the intent and purpose of the National Natural Landmark program to maintain aesthetics on the peninsula.

We would work with our partners, including TTOR and NCF to promote conservation and natural resources stewardship on Nantucket. To accomplish this, we would explore additional signage, brochures, and other avenues to promote our conservation partnerships and conservation programs both on- and offsite. We would also work with MMA and other partners to provide offsite interpretive displays for the refuge.

Some examples of important interpretive messages that we would expand upon, if resources are available, are

- the roles that fishing and coastal beach protection have traditionally played in wildlife conservation over the past centuries;
- the importance of managing for native species and habitats as the best way to benefit fish and wildlife that depend upon healthy, functioning coastal ecosystems; and
- management actions in the context of local and regional conservation issues.

The Service strives to provide opportunities for compatible outdoor recreational opportunities. We hope to contribute to communities around the refuge, both in terms of health and well-being, and economically. We partner with other agencies and organizations to promote connecting adults and children with nature, thereby reducing "nature-deficit disorder." A growing body of research suggests that a lack of direct involvement with the outside world may be contributing to a variety of maladies affecting children in today's society (Louv 2005). By offering places and programs where children and their parents can observe wildlife in natural

settings, and learn to appreciate wildlife and fishing, we will contribute to the growing national initiative to reconnect children with nature.

**Strategies**
*In addition to those listed under alternative A, objective 2.2:*

*Continue to:*
- Update and improve the Web site for Nantucket NWR.
- Establish and maintain Service-compliant regulatory signs.
- Develop community partnerships with elected officials, and Tribal, regional, and local governments and agencies to increase support for the refuge, and to strengthen our outreach capabilities.
- Explore opportunities for offsite interpretive displays and information, including the Maria Mitchell Association, and other locations downtown.

*Within 1 year:*
- Develop primitive access trail through dunes where appropriate.
- Provide interpretive materials to partners.
- Coordinate with TTOR to install/use webcam at lighthouse to highlight/monitor wildlife and visitor activity.

*Within 2 years:*
- Develop quality seasonal interpretative programming in collaboration with partners.
- Collaborate with local nonprofit organizations to develop an interpretive guide for the peninsula within 2 years.
- Work with partners to develop and install interpretive panels at the lighthouse.
- Develop a wildlife list for all animal and plant taxa.
- Work with partners to develop brochures.
- Explore the acquisition of an Americans with Disabilities Act (ADA)-compliant Service van on Nantucket Island available to Service staff when on the island, and for partners to use for tours, etc. (magnetic decals).

*Within 3 years:*
- Create a general refuge brochure and rack card. Collaborate with partners for joint messages.
- Conduct seasonal interpretive walks on the refuge.

*Within 5 years:*
- Install interpretive panels and/or brochures on Steamship Authority ferries and/or at harbor visitor centers.
- Establish an annual tour of the refuge with elected officials.

- Work with partners to install a kiosk at the gatehouse, with interpretive panels (which includes information on partnerships, roles, rules, boundaries, and refuge system/refuge panels).

- Assist conservation partners with interpretation on their properties, particularly when that interpretation helps inform and educate the public about coastal resources and resources that are also specifically found on Nantucket NWR.

Amanda Boyd/USFWS

*Hauled-out seals at Great Point*

**Monitoring Elements**
- Number of visitors reached by programs on and off site.

- Number of programs and materials produced.

- Number of tours provided.

**Objective 2.4. Wildlife Observation and Photography**

Over the next 15 years, provide more quality, compatible experiences for the public to enjoy and capture the refuge's wildlife and habitat diversity. Within 5 years, develop additional opportunities for observation and photography of the wildlife and habitats on the refuge.

**Rationale**
The Improvement Act identifies wildlife observation and photography as priority wildlife-dependent recreation. They promote the understanding and appreciation of natural resources and their management on all lands and waters in the refuge system. As described under alternative A, we have been providing daily wildlife observation and photography opportunities on the refuge since we acquired it in 1973. Our intention under this alternative would be to enhance these opportunities by providing brochures identifying common refuge wildlife and habitat, and to indicate some of the most opportunistic places on the refuge for viewing wildlife. We would also explore ways to provide photographic opportunities at the lighthouse, and of focal species of interest.

**Strategies**
- In addition to those listed in alternative A objective 2.3:

*Within 1 year:*
- Develop a primitive trail through refuge lands that keeps foot traffic on an established path.

- Work with partners to open the lighthouse at certain hours for photographic opportunities.

- Install a Web cam on the Great Point Lighthouse.

- Within 2 years:

- Create a habitat/species checklist brochure.

*Within 3 years:*
- Identify and publicize the best locations and seasonal subjects for observation and photography (through brochures, at the kiosk, Web site etc.).

*Within 5 years:*
- Work with partners to conduct an annual photography contest on Nantucket including a Youth Photo Contest.

**Monitoring Elements**
- Number of visitors reached by programs on- and off –site.

- Number of programs and materials produced.

### Objective 2.5. Fishing

Over the next 15 years, continue to provide quality, compatible experiences for those who come to the refuge for its unique fishing opportunities. In the next 5 years, develop additional programs with the community and partners to provide quality fishing on the Coskata-Coatue Peninsula.

**Rationale**
The Improvement Act identifies fishing as a priority wildlife-dependent recreation. It states, "Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System." We recognize fishing as a healthy, traditional outdoor past time. It, too, promotes public understanding and appreciation of natural resources and their management on all lands and waters in the refuge system.

We have provided for recreational fishing access along the beach at the refuge since it was established in 1973. We recognize its importance as a sport fishing destination and under this alternative we would continue to provide recreational fishing opportunities in coordination with TTOR, as they manage and monitor the area. We would require anglers to comply with State and Federal regulations, which includes obtaining a saltwater fishing license. State law enforcement is located on Nantucket Island and enforces the State and Federal fishing regulations to the extent possible. In addition, a refuge complex law enforcement officer would be available to monitor and enforce refuge guidelines and policies.

TTOR has a strong presence on the Coskata-Coatue Peninsula, and we would continue to work with them to communicate fishing regulations to anglers, and also to provide fishing tours and instruction to the general public. The Service would play a more active role and manage fishing more closely to assure that it is

compatible with the other refuge goals and mandates, particularly the protection of overall biodiversity and threatened and endangered species management.

We would endeavor to promote fishing on the refuge by participating in local fishing tournaments, contracting with vendors to provide guided fishing tours for the general public, and by providing distributional materials describing local sport fish of interest and applicable fishing regulations. We would explore partnerships with the Nantucket Anglers Club, and other groups to ensure quality fishing opportunities and experiences on the refuge.

**Strategies**
*Continue to:*
- Provide fishing access in appropriate zones and date closures required by State and Federal law for habitat and species protection (see objective 1.1).

*Within 1 year:*
- Require commercial fishing tours/guides on refuge under special use permits.
- Post and distribute seasonal harvest and other current fishing information and regulations on the refuge kiosk and Web site.

*Within 2 years:*
- Work with partners to become involved with annual tournaments and provide increased Service presence.

*Within 3 years:*
- Conduct "Take me Fishing" event for the general public which is focused on children within 3 years on the refuge in collaboration with the State and other partners.

**Monitoring Elements**
- Number of fishermen and/or OSVs.
- Frequency of quality fishing experiences on the refuge.
- Number of programs and/or activities and materials produced for fishing.

**GOAL 3.** **Perpetuate and enhance long-term conservation and management of wildlife resources on and around Nantucket Island through partnerships and land protection with public and private landowners, Federal, State, and local entities.**

**Objective 3.1. Protecting Land**

Working with other Federal, State, and local partners, protect important wildlife habitat within Nantucket County by initiating protection of key habitats identified in a larger landscape approach within 3 to 5 years.

**Rationale**
Nantucket NWR was established for its benefit as a wildlife sanctuary for migratory birds. Migratory birds utilize the refuges in the refuge complex and other adjacent refuges as stepping stones along the Atlantic Flyway. Monomoy, Nomans Land Island, Nantucket, Block Island, and Stewart B. McKinney NWRs work in concert to provide important stopover habitat for shorebirds, wading birds, neotropical migrants, and other birds. As coastal areas change due to erosion, storms, climate change, and sea level rise preserving these and other important wildlife habitat areas become critical for their lifecycles. The ability of the Nantucket NWR to meet its purpose is currently limited by its small area and popularity as a fishing destination. In order to maintain these important wildlife habitat areas for the long-term, we propose to protect and

enhance additional habitat outside of the approved NWR boundary that support Federal trust wildlife resources and State-listed or regionally significant wildlife and plant communities on the island of Nantucket. By working with partners, additional land protection on Nantucket allows the Service to fulfill its mission in conserving and protecting outstanding wildlife and habitat to benefit the refuge system and the American people.

**Strategies**

*Continue to:*

- Work with the town of Nantucket and other partners to protect the 195-acre Head of the Plains (former FAA property) as a no-cost transfer from the GSA.
- Work with the Coast Guard for the Service for right of first refusal for any Coast Guard properties, including acquiring the former Loran Station in Siasconset, Massachusetts (which includes potential housing and facility options).

*Within 1 year:*

- Send official letter from the Service to the Coast Guard documenting Service interest in acquiring the Great Point Lighthouse as a no-cost transfer from the Coast Guard.
- Send official letter from the Service to the Coast Guard documenting Service interest in acquiring the Nantucket Loran Station as a no-cost transfer from the Coast Guard.

*Within 3 years:*

- Work with partners (TTOR and NCF) and the National Park Service to pursue designation of Natural National Landmark for the Coskata-Coatue Peninsula.
- Work with partners to enhance the protection of adjacent conservation lands currently owned by the NCF (589 acres) and The Trustees of the Reservations (911 acres) through conservation easements and management agreements.
- Work with the town of Nantucket, the Nantucket Land Bank, the Nantucket Land Council, and the Crocker Snowe family to protect the 175-acre Muskeget Island and to cooperatively manage the wildlife resources on the island.

*Within 5 years:*

- Work with the town to acquire portions of the town owned property at Lower Beach Road through land exchange with the town of Nantucket.

*Within 10 years:*

- Work with the owners of the current Lohmann and Jellamie properties for long-term protection of these properties through fee title, land exchange, or conservation easement or develop a management agreement.
- Pursue acquisition and/or Management Agreement of the Eel Point property and The Creeks area currently owned by the NCF.
- Work with partners to explore options along bus/bike route to acquire property for a joint visitor contact station on or off the refuge.

**Monitoring Elements**

- Number of acres protected through easement or acquisition.
- Number of new sites protected.
- Number of new Management Agreements for lands owned by partners.

## Alternative C. Wildlife Diversity and Natural Processes Emphasis

This alternative describes how the Service would manage the refuge with an emphasis on wildlife diversity and natural coastal processes. It emphasizes habitat and priority species protection on the refuge by protecting the habitat over a longer time period to vehicle access and disturbance. This would maximize wildlife diversity, habitat integrity, and protection of Federal and State species of conservation concern using the refuge for nesting and migration. It would not allow OSV over most of the refuge during April 1 through September 15 in order to avoid and minimize any disturbance to nesting and migrating birds and reduce the impacts of OSV on macroinvertebrate communities, vegetative communities, and dune structure and function. Alternative C includes expansion of current management over the next 15 years on the approximately 21 existing acres plus the additional 1,790 acres approved for acquisition/easement, as funding and staffing levels permit. We would pursue an updated MOU or Partnership Agreement with TTOR which addresses resource management, visitor use, and shared funding sources to help support refuge operations.

We would continue our adaptive management approach of modifying management actions based on new information with a concerted effort to collect data upon which to make management decisions. Chapter 3 presents the types of refuge habitat.

### Habitat Management and Protection

Although we are not able to predict the extent of future acquisitions within the next 15 years, Service priority is to pursue protection of all surplus Federal lands, in-holdings, and other key properties on Nantucket and associated islands, as in alternative B. Where outright purchase is not an option, the Service would work with partners to explore opportunities for conservation easements and overlays.

Habitat management under this alternative would be similar to alternative B, except that vehicle access would be limited to a small portion of the refuge between April 1 and September 15 each year. Management would address identified threats to the habitat that would likely include invasive, pest, or predator species control as well as dune protection and/or restoration to maintain natural beach processes. This would be accomplished primarily by manual techniques, but may also call for biological or chemical means such as prescribed burning or herbicides to maintain the health and functioning of the beach and dune ecosystem. These actions would be evaluated independently, and be based on need, utility, and availability of staff and funds.

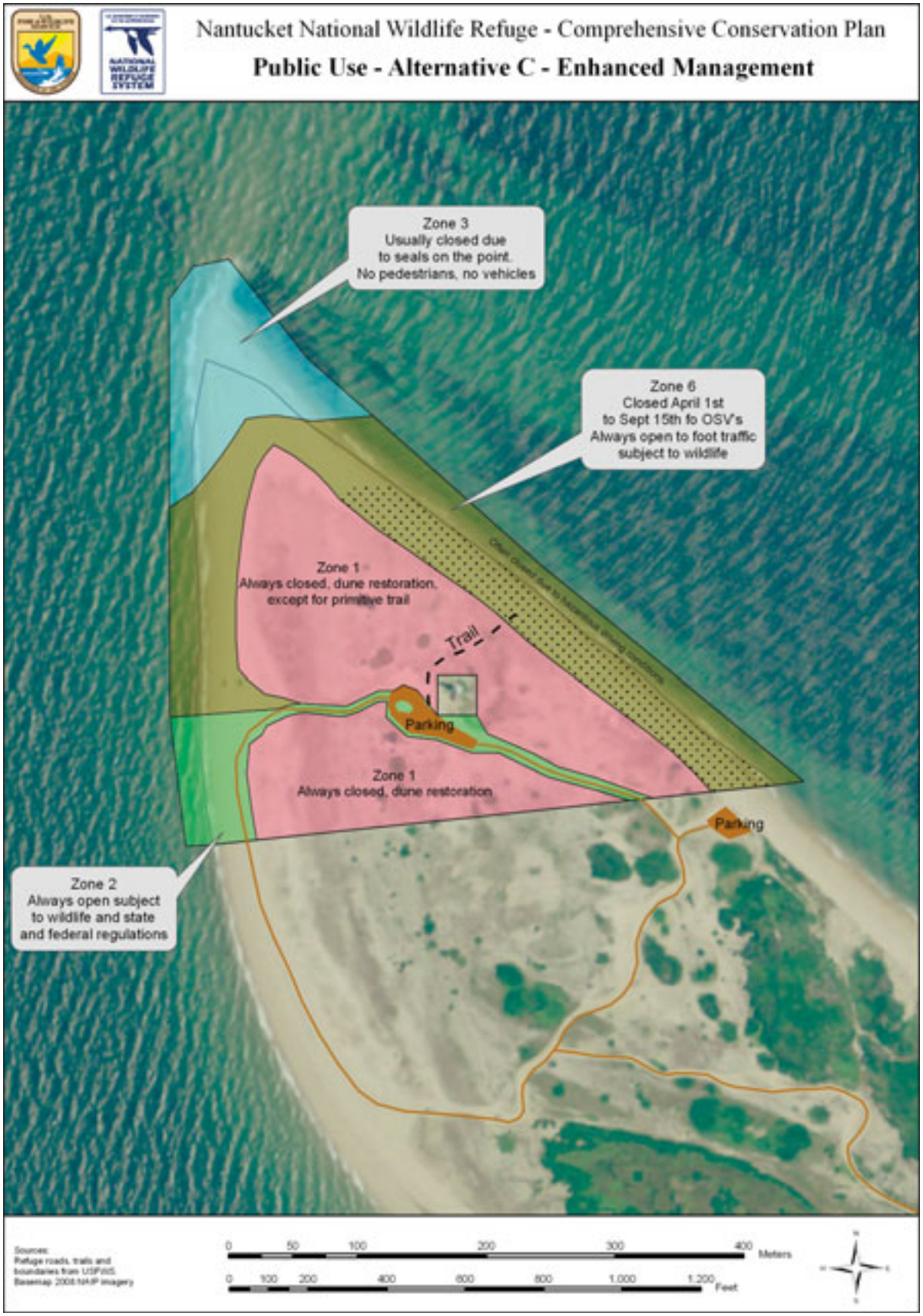
### Inventories and Monitoring

The Service would initiate monitoring and inventory efforts to provide key information on Federal trust resources as long as we have the necessary resources to accomplish them, as in alternative B. These efforts would be focused on helping us understand better the implications of our management actions and ways to improve our efficiency and effectiveness. Specifically, we would devote staff time to evaluating nesting habitat, nesting success and productivity for priority bird species of conservation concern.

### Visitor Services

Visitor services would be the same as under alternative B except for the OSV closure zones from April 1-September 15 each year under this alternative (map 2-3). The Service would collaborate with partners to disseminate information on this seasonal OSV restriction on the refuge.

Under this alternative, we would explore the opportunity to install a web-cam on the lighthouse, and this would provide wildlife and habitat viewing opportunities at Great Point year round through the internet. Additional efforts would be made to sponsor and participate in outreach opportunities and activities for visitors and residents of Nantucket that highlight the Service's role as a steward of natural resources.


Nantucket National Wildlife Refuge - Comprehensive Conservation Plan
Public Use - Alternative C - Enhanced Management
Zone 3
Usually closed due
to seals on the point.
No pedestrians, no vehicles
Zone 6
Closed April 1st
to Sept 15th to OSV's
Always open to foot traffic
subject to wildlife
Zone 1
Always closed, dune restoration,
except for primitive trail
Trail
Parking
Zone 1
Always closed, dune restoration
Parking
Zone 2
Always open subject
to wildlife and state
and federal regulations
Meters
Feet

**Refuge Administration**

This alternative proposes that we achieve a level of staffing that meets the minimum requirements for a refuge complex of this size and importance by adding the same 1.5 positions proposed under alternative B, with the addition of a seasonal visitor services intern during the summer. We would base any increases in staffing on available, permanent sources of funding, and would consider them in the context of regional and refuge priorities.

The Service would seek to establish a joint visitor facility with TTOR and NCF as in alternative B, as well as the installation of a kiosk at the gatehouse and interpretive panels on the refuge. Under this alternative, we would explore creating a trail through the refuge, with a viewing platform and/or photo blind. This may include construction of a boardwalk to minimize adverse impacts on sensitive dune habitats. All structural additions to the refuge would be consistent with the intent and purpose of the National Natural Landmark program to maintain the aesthetic quality on the refuge.

The section that follows describes in detail the goals, objectives, and strategies that we would implement in alternative C.

**GOAL 1.**

**Perpetuate and enhance the biological integrity and diversity of coastal habitats on and around Nantucket Island to support and enhance native wildlife and plant communities, with an emphasis on species of conservation concern.**

**Objective 1.1. Dune and Shoreline Habitat.**

Over the next 15 years, work cooperatively with partners (TTOR, NCF, Massachusetts Audubon Society) to protect from disturbance and degradation, approximately 21 acres of marine intertidal beach, beach berm, and dune habitat to preserve biological integrity and benefit: nesting piping plovers, least terns and common terns, staging and migrating terns, migrating shorebirds, and marine mammals. Through seasonal closures, predator management, and public education, maintain a minimum productivity of 1.5 chicks per nesting pair of piping plovers and 1.0 chicks per nesting pair of terns over a 5-year period. Maintain approximately 4.4 acres of intertidal beach habitat with a public viewing distance of 50 yards to benefit migrating shorebirds, staging terns, and seals by regulating and directing public use to less sensitive areas especially during peak times of use (late summer and early fall for shorebirds and terns, spring for seals).

**Rationale**

As described under alternative B, coastal beach and dune habitats are vital to the biological health and integrity of coastal ecosystems as well as to coastal species of conservation concern. Disturbance of coastal birds attributed to OSV use is well documented in the literature (Pfister et al. 1992, Buick and Paton 1989). Additionally, OSV use has been shown to reduce macrobenthic species diversity and overall abundance (Schlacher et al. 2008, Wolcott and Wolcott 1984) as well as significantly reduce vegetation communities (Godfrey and Godfrey 1980, Anders and Leatherman 1987). OSV use at Fire Island National Seashore was found to both reduce vegetation on coastal foredunes and altered the natural foredune profile, both of which may contribute to increased dune erosion during storm surge (Anders and Leatherman 1987).

Under this alternative, management would be similar to alternative B, with additional vehicle access restrictions from April 1 until September 15 on parts of the refuge, regardless of bird nesting activity. This additional restriction would minimize impacts of OSV to macroinvertebrate and vegetative communities and reduce OSV-related changes to dune formation, structure, and function. Changes would be closely monitored. Greater emphasis would be placed on dune conservation and restoration. No foot traffic would be allowed in the dunes at all,

unless we determine the construction of a boardwalk is warranted, and we would initiate community dune grass planting days to re-vegetate heavily trodden areas in the dunes if necessary.

**Strategies**
*Same as alternative B and additionally:*
- Within 3 years, seasonally close most of the refuge to all, regardless of bird nesting activity, to provide maximum protection to macroinvertebrate communities, vegetative communities, dune processes, and wrack lines.

**Monitoring Elements**
*Same as alternative B and additionally:*
- Monitor changes in dunes and vegetation with increased OSV restrictions.

**GOAL 2.** **Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.**

**Objective 2.1 Visitor Access**

Over the next 15 years, protect nesting and staging habitat throughout most of the refuge from April 1 through September 15 through seasonal zone closures. Zones will be used to delineate and protect areas of suitable habitat for breeding and staging birds, as well as hauled-out seals. Visitors may participate in any compatible public use on the refuge in areas that are open to the public.

**Rationale**
This alternative is similar to alternative B with the exception that there is a longer seasonal restriction on the use of OSVs on the refuge. Three zones (Zones 2, 3 and 6) delineate pedestrian and vehicle access opportunities (see map 2-3). Vehicles could access the refuge from TTOR land on the west side of the refuge, travel up the beach to the lighthouse access road, and then exit the refuge on the east back to the TTOR road network. No other vehicular access would be allowed April 1 through September 15. Additionally, as in alternative B, the Service would seek to identify alternative transportation options and seek additional funding and support for refuge visitation. A primitive foot trail would be established on the refuge from the lighthouse to the east beach to provide pedestrian access for fishing, wildlife observation, and other compatible beach activities.

This alternative provides for compatible public use but is more conservation focused, thereby reducing potential disturbance to wildlife and its habitat to the maximum extent possible, while still allowing for some public use of the refuge. The benefits to wildlife under this alternative are explained under objective 1.1.

**Strategies**
*Same as alternative B, objective 2.1, except that within 3 years, implement the pedestrian and vehicular access zones identified in map 2-3.*

**Monitoring Elements**
*Same as alternative B.*

**Objective 2.2. Environmental Education**

Over the next 15 years, work with partners to develop and implement a quality onsite environmental education program, based on existing curricula, and activities to highlight the benefit of landscape-level management, and to further communicate our knowledge and understanding of Nantucket's coastal ecosystems and the migratory birds, marine mammals, and endangered and threatened species that depend upon them.

**Rationale**
The Improvement Act identifies environmental education as priority wildlife-dependent recreation. As previously mentioned, it is a critical component of creating a knowledgeable citizenry that will be motivated to work cooperatively toward the conservation of our Nation's environmental resources. It promotes the understanding and appreciation of natural resources and their management on all lands and waters in the refuge system.

The addition of a half-time year-round visitor services specialist would lend support to the expanded visitor services programs on the refuge proposed under this alternative. In addition to those environmental education activities described under alternative A, this would translate into additional coordination and participation with TTOR and other partners to provide quality outdoor classroom programs on the refuge.

**Strategies**
*Same as alternative B, objective 2.1, with a refuge-specific focus.*

**Monitoring Elements**
- Number of visitors reached by programs.
- Number of programs and materials produced.

### Objective 2.3 Interpretation and Public Outreach

Over the next 15 years, provide focused interpretation programs by providing limited tours of the refuge to increase awareness of the Service presence on Nantucket, and define how the biological resource conservation on Nantucket NWR exemplifies the National Wildlife Refuge System. Within 3 years, develop Nantucket NWR information and messaging for additional, enhanced signage, materials, and tours which all highlight the protection and stewardship priorities of the refuge.

**Rationale**
The Improvement Act identifies interpretation as priority wildlife-dependent recreation. It includes activities, talks, publications, audio-visual media, signs, and exhibits that convey key messages about natural and cultural resources to visitors. It provides opportunities for visitors to make their own connections to the resource, which invites participation in resource stewardship and helps refuge visitors understand their relationships to, and impacts on, those resources.

Under this alternative, and with our increase in onsite staff, our interpretive activities on the refuge would be expanded. We would be able to accomplish a greater amount and variety of programs, and reach broader audiences through a diversification of our collaborative partnerships on the island. The Service would be able to provide a leadership role in connecting both residents and visitors to the natural resources of Nantucket.

Self-guided and guided services on the refuge would be available under this alternative, as we would explore the installation of a primitive walking trail through the refuge, and continue to provide authorized tours. Service staff would be available to lead regular interpretive programs, design distributional material, update the Web site, and submit regular updates to local newspapers. We would use visitor and attendee feedback to evaluate the effectiveness of our program. All structural additions to the refuge would be consistent with the intent and purpose of the National Natural Landmark program to maintain the aesthetic quality of the refuge.

In particular, our outreach activities to the community, elected officials, and local and regional governments and agencies would expand under this alternative. Onsite staff would provide the presence and staff support required to establish and maintain relationships with community groups and local officials. They would be available to conduct guided tours of the refuge annually for Tribal, State, and local government officials.

**Strategies**
*Continue to:*
- Establish and maintain Service-compliant regulatory signs.

*Within 1 year:*
- Develop seasonal interpretation programming on the refuge.
- Develop access trail through dunes where appropriate.
- Provide information upon request from local organizations.

*Within 2 years:*
- Develop a wildlife list for all animal and plant taxa.
- Collaborate with local nonprofit organizations to develop an interpretive guide for the Coskata-Coatue Peninsula.
- Create a general refuge brochure and rack card.
- Establish an annual tour of the refuge with elected officials.

*Within 3 years:*
- Conduct seasonal interpretive walks on the refuge.
- Within 5 years:
- Collaborate with partners to develop a cooperative partnership building offsite which would also provide Service housing quarters and a garage.
- Provide a brochure on Steamship Authority ferries and/or at harbor visitor centers.

**Monitoring Elements**
- Number of visitors reached by programs on and off site.
- Number of programs and materials produced.

### Objective 2.4. Wildlife Observation and Photography

Over the next 15 years, provide more compatible experiences for the public to enjoy and capture the refuge's wildlife and habitat diversity. Within 3 years, develop additional opportunities for observation and photography of wildlife and habitats on the refuge.

**Rationale**
The Improvement Act identifies wildlife observation and photography as priority wildlife-dependent recreation. They promote the understanding and appreciation of natural resources and their management on all lands and waters in the refuge system. Under this alternative, we would incorporate more opportunities to support wildlife observation and photography, including installing a Web cam

on the lighthouse to promote viewing the refuge year-round and also evaluating the feasibility of a trail. Additional enhancements would include a brochure and interpretive panels identifying refuge wildlife and habitat.

**Strategies**
*Same as alternative B, objective 2.3, except the refuge staff would not be involved with a Nantucket Island-wide photography contest.*

**Monitoring Elements**
- Number of visitors reached by programs on and off site.
- Number of programs and materials produced.

### Objective 2.5. Fishing

Over the next 15 years, continue to provide quality, compatible experiences for those who come to the refuge for its unique fishing opportunities. In the next 3 years, allow compatible fishing opportunities along refuge shoreline. In the next 5 years, develop additional programs with the community and partners to provide quality fishing on the peninsula.

**Rationale**
The Improvement Act identifies fishing as priority wildlife-dependent recreation. It states, "Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System." We recognize fishing as a healthy, traditional outdoor past time. It, too, promotes public understanding and appreciation of natural resources and their management on all lands and waters in the refuge system.


Amanda Boyd/USFWS

*Refuge visitors enjoying fishing*

We have provided for recreational fishing access along the beach at the refuge since it was established in 1973. As in the previous alternatives, we would continue to provide recreational fishing opportunities on the refuge outside of the critical nesting and migration season, and in coordination with TTOR. In addition, we would acquire onsite visitor services personnel that would provide Service-lead support for fishing programs. We also would evaluate the possibility of contracting with a concessionaire to provide guided fishing tours for the general public. In addition, we would post seasonal harvest information on the refuge kiosk and Web site.

We would require anglers to comply with State and Federal regulations, which includes obtaining a saltwater fishing license. State law enforcement is located on Nantucket Island and would enforce State and Federal fishing regulations to the extent possible. In addition, a refuge complex law enforcement officer will be available to provide monitoring and enforcement of refuge guidelines and policies on Nantucket, Monomoy, Mashpee, and Nomans Land Island NWRs.

**Strategies**
*Same as alternative B, objective 2.4, except refuge staff would not be involved with fishing event and/or areawide tournament.*

**Monitoring Elements**
- Number of fishermen and/or OSVs.
- Number of programs/activities and materials produced for promoting fishing.

**GOAL 3.** **Perpetuate and enhance long-term conservation and management of wildlife resources on and around Nantucket Island through partnerships and land protection with public and private landowners, Federal, State, and local entities.**

### Objective 3.1. Land Protection

Working with other Federal, State, and local partners, evaluate opportunities to protect important wildlife habitat within Nantucket County as the Service is notified of availabilities in Federal excess properties and potential visitor center locations, and as funding and staffing allow.

**Rationale**
Nantucket NWR was established for its benefit as a wildlife sanctuary for migratory birds. Migratory birds utilize the refuges in the complex and other adjacent refuges as stepping stones along the Atlantic Flyway. Monomoy, Nomans Land Island, Nantucket, Block Island, and Stewart B. McKinney NWRs work in concert to provide important stopover habitat for shorebirds, wading birds, neotropical migrants, and other birds. As coastal areas change due to erosion, storms, climate change, and sea level rise preserving these and other important wildlife habitat areas become critical for their lifecycles. The ability of the Nantucket NWR to meet its purpose is currently limited by its small area and popularity as a fishing destination. In order to maintain these important wildlife habitat areas for the long-term, we propose to protect and enhance additional habitat outside of the approved refuge boundary that support Federal trust wildlife resources and State-listed or regionally significant wildlife and plant communities on the island of Nantucket. By working with partners, additional land protection on Nantucket allows the Service to fulfill its mission in conserving and protecting outstanding wildlife and habitat to benefit the refuge system and the American people.

**Strategies**
Evaluate land acquisition opportunities in cooperation with partners as the Service is notified of availabilities of excess Federal properties in the future.

**Monitoring Elements**
- Number of acres protected through easement or acquisition.
- Number of new sites protected.

*Looking south from the lighthouse*

Karen Terwilliger/TCI

**Table 2.1. Matrix of the Considered Alternatives.**

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 1. Perpetuate and enhance the biological integrity and diversity of coastal habitats on and around Nantucket Island to support and enhance native wildlife and plant communities, with an emphasis on species of conservation concern.** | | | |
| *Responds to Issues:* How will we address disturbance and predation to priority birds, seals, and shoreline change of Nantucket NWR? Will addressing these needs be compatible with traditional beach uses which are also Service priority public uses? How can we best integrate Service management with adjacent land managers and promote consistent, seamless management of the Costkata-Coatue Peninsula? | | | |
| **Objective 1.1 Dune and Shoreline Habitat** | Over the next 15 years, continue the Service's minimal oversight and rely on TTOR to protect 13 acres of dune habitat and manage 7.5 acres of marine intertidal beach and beach berm along approximately 1,000 yards of shoreline to preserve biological integrity and benefit nesting piping plovers, least terns, and common terns; staging and migrating terns; and; marine mammals.<br>• Annually protect existing piping plover habitat refugewide by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through historic and suitable nesting habitat in accordance with Federal guidelines by April 1.<br>• Annually protect common, roseate, and least tern nesting habitat where it overlaps with plover habitat refugewide by preventing vehicular and pedestrian access by April 1.<br>• Protect habitat for staging terns when it coincides with or is immediately adjacent to seal haul-out areas by maintaining symbolic fencing and preventing pedestrian and vehicular access. | Over the next 15 years, work cooperatively with partners (TTOR, NCF, Massachusetts Audubon Society) to protect from disturbance and degradation, approximately 21 acres of marine intertidal beach, beach berm, and dune habitat to preserve biological integrity and to benefit: nesting piping plovers, least terns and common terns; staging and migrating terns; migrating shorebirds, and marine mammals. Through seasonal closures, predator management, and public education, maintain a minimum productivity of 1.5 chicks per nesting pair of piping plovers and 1.0 chicks per nesting pair of terns over a 5-year period. Maintain approximately 4.4 acres of intertidal beach habitat with a public viewing distance of 50 yards to benefit migrating shorebirds, staging terns, and seals by regulating and directing public use to less sensitive areas especially during peak times of use (late summer and early fall for shorebirds and terns).<br>*Continue to:*<br>• Implement closures to protect seal haul-out sites using symbolic fencing when at least 25 seals are present in the area. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines.<br>• Coordinate with National Marine Fisheries Service and other organizations to protect seals.<br>*Within 1 year:*<br>• Establish a seasonal closure to vehicles and pedestrians on the northwest tip of the refuge where staging terns have occurred in recent years. This closure will generally be from August 1 to September 15. We will use the principles of adaptive management to determine if closures are warranted, where, and for what period of time. Generally, location will be dependent on shifting habitat suitability and bird use and dates of closures will be dependent on nesting and migration chronology. We will use adaptive management to determine management regimes and decisions that result from monitoring. Closure dates and locations will be correlated with staging tern use so that the effectiveness of the closures can be assessed and modifications made to protect birds while minimizing restrictions to refuge visitors. | *Same as alternative B, except conservation efforts are focused on Service lands.*<br>*Additionally,*<br>• Within 3 years, seasonally close most of the refuge to all, regardless of bird nesting activity, to provide maximum protection to macroinvertebrate communities, vegetative communities, dune processes, and wrack lines. |

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 1** *(continued)***. Perpetuate and enhance the biological integrity and diversity of coastal habitats on and around Nantucket Island to support and enhance native wildlife and plant communities, with an emphasis on species of conservation concern.** | | | |
| *Responds to Issues:* How will we address disturbance and predation to priority birds, seals, and shoreline change of Nantucket NWR? Will addressing these needs be compatible with traditional beach uses which are also Service priority public uses? How can we best integrate Service management with adjacent land managers and promote consistent, seamless management of the Costkata-Coatue Peninsula? | | | |
| **Objective 1.1 Dune and Shoreline Habitat** *(continued)* | • Implement closures to protect seal haul-out sites when at least 25 seals are present in the area using symbolic fencing. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines. | *Within 1 year (continued):*<br>• Control invasive species throughout the refuge when possible.<br>• Annually protect existing piping plover habitat refugewide by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through historic nesting habitat in accordance with Federal guidelines by April 1. Additionally prohibit vehicle access in on most of the beach from April 1 to at least July 1, or until nesting piping plovers have fledged chicks.<br>• If piping plover chicks hatch, maintain a vehicle free area extending 1,000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. Closures in areas with piping plover chicks remain in effect until chicks are at least 35 days old, or capable of at least 15 meters of sustained flight.<br>• If no territorial piping plovers have established by July1, and areas are not part of other zoning closures (see below), then areas may be opened for vehicular and/or pedestrian access.<br>• Annually protect common and least tern nesting habitat refugewide by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through suitable habitat by May 15 and until at least July 1. If terns are not established by this date, access restrictions may be lifted. Maintain a buffer of 50 meters around nesting areas.<br>• When unfledged least tern chicks are present, vehicle closures will be enforced to provide a 100-yard buffer perpendicular to the long axis of the beach, from the perimeter of the colony. Closures are in effect until terns are observed to be capable of flight.<br>*Within 5 years:*<br>• Maintain a year round closure in the beach dune habitat, with the exception of a pedestrian access trail from the lighthouse to the east beach, to protect dune ecosystem integrity.<br>• Conduct beach plantings or otherwise restore dune trampling resulting from trespass in the dune habitat. | |

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 1** *(continued)***. Perpetuate and enhance the biological integrity and diversity of coastal habitats on and around Nantucket Island to support and enhance native wildlife and plant communities, with an emphasis on species of conservation concern.** | | | |
| *Responds to Issues:* How will we address disturbance and predation to priority birds, seals, and shoreline change of Nantucket NWR? Will addressing these needs be compatible with traditional beach uses which are also Service priority public uses? How can we best integrate Service management with adjacent land managers and promote consistent, seamless management of the Costkata-Coatue Peninsula? | | | |
| **Objective 1.1 Dune and Shoreline Habitat** *(continued)* | | *Within 5 years (continued):*<br>• Determine impacts of predators (feral cats, rats, gulls, and others) to nesting piping plovers and terns, and implement predator control (lethal and non-lethal) if necessary.<br>• Collaborate with partners to initiate a study of staging terns to determine the relative importance of Nantucket NWR and quantify potential disturbance impacts. Work with partners to ensure that data can be incorporated in larger landscape studies. Implement additional beach management /fencing where scientific data exist to demonstrate the need for any changes in management.<br>• Migrating shorebirds may benefit from closures for staging terns and seals, thus, conduct periodic surveys for these species in conjunction with other biological work.<br>• Conduct research to fill data gaps. Potential research includes importance of Nantucket NWR to migratory shorebirds, bats, and seals, and impacts of recreational use to nesting and migrating birds. | |

| **Refuge Resource or Program** | **Alternative A** Current Management | **Alternative B** Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C** Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Objective 1.2 Landscape-level Conservation** | *Not Applicable* | Over the next 15 years, upon the invitation of other conservation landowners, work cooperatively on partner lands, including TTOR, NCF, and the Massachusetts Audubon Society to protect from disturbance and degradation marine intertidal beach, beach berm, and dune habitat to preserve biological integrity and benefit breeding and staging birds and marine mammals. When staff is available, up to 25 percent of staff time may be dedicated to habitat management, wildlife management, and inventory and monitoring on partner lands in support of focal species.<br>• Provide assistance to symbolically fence suitable habitat on partner lands.<br>• Provide assistance to conduct inventory and monitoring actions on partner lands.<br>• Provide assistance in surveying, monitoring, and conducting habitat evaluations for New England cottontail on partner properties. With partners, determine appropriateness and feasibility of a New England cottontail release on suitable sites.<br>• Participate in Nantucket shorebird meetings.<br>• Conduct research to fill data gaps. Potential research includes importance of conservation lands on Nantucket to migratory shorebirds, bats, and seals, and impacts of recreational use to nesting and migrating birds.<br>• Determine impacts of predators to nesting piping plovers and terns, and implement predator control (lethal and non-lethal) if necessary. | *Not Applicable* |

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 2. Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.** | | | |
| *Responds to Issues:* How can we best communicate, provide, and balance multiple Service objectives of habitat protection and management with public use and fishing access? How can we explore additional options to beach access including pedestrian and vehicle areas, boardwalk, shuttle, tours, etc. to provide additional experiences and programs while reducing number/impacts of vehicles on the peninsula? How can the Service best facilitate the need to coordinate and communicate the different land managers and their policies? How can Service provide more, current information and signage to delineate boundaries, communicate Nantucket NWR's policies, and interpret natural resources without detracting from natural setting to community and visitors? How can we best partner with local organizations for interpretive programs, access opportunities and distribute information? | | | |
| **Objective 2.1 Visitor Use and Access** | Over the next 15 years, work with TTOR staff to provide pedestrian and OSV access to the refuge while maintaining closures that reduce disturbance to wildlife from visitors and protect suitable nesting habitat for piping plovers and other species of conservation concern. The exact location and timing of the closures is flexible to respond to the presence of wildlife. Visitors may participate in any compatible public use on the refuge in areas that are open to the public.<br>• Renew MOU with TTOR to strengthen partnerships on and off Nantucket NWR, and to promote management cooperation and coordination when possible.<br>• Seasonally adjust closures to allow pedestrian and OSV access while minimizing disturbance to seals, plovers, and terns.<br>• in the area using symbolic fencing. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines. | Over the next 15 years, utilize a system of zone management to provide pedestrian and/or OSV access to at least some portions of the refuge while maintaining closures that reduce disturbance to wildlife from visitors. Zones will be used to delineate and protect areas of suitable habitat for breeding and staging birds, as well as hauled-out seals. Flexibility in maintaining zone closures will be incorporated if, after a specified period of time, no species of concern are present; in general, at least some portion of the refuge will be closed between April 1 and September 15. Visitors may participate in any compatible public use on the refuge in areas that are open to the public.<br>*Within 1 year:*<br>• Revise and update the existing partnership agreement with TTOR to strengthen partnerships on and off the refuge.<br>• Provide up-to-date, accurate information about visitor access opportunities and seasonal closures in an understandable way on the web and through handouts available at the Wauwinet Gatehouse, and other information distribution mechanisms.<br>• Manage pedestrian and vehicle access as shown in map 2-2 for the purpose of wildlife protection in goal 1. | Over the next 15 years, protect nesting and staging habitat throughout most of the refuge from April 1 to September 15 through seasonal zone closures. Zones will be used to delineate and protect areas of suitable habitat for breeding and staging birds, as well as hauled-out seals. Visitors may participate in any compatible public use on the refuge in areas that are open to the public.<br>*Similar to alternative B, except that within 3 years, implement the pedestrian and vehicular access zones identified in map 2-3.* |

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 2** *(continued)***. Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.** | | | |
| *Responds to Issues:* How can we best communicate, provide, and balance multiple Service objectives of habitat protection and management with public use and fishing access? How can we explore additional options to beach access including pedestrian and vehicle areas, boardwalk, shuttle, tours, etc. to provide additional experiences and programs while reducing number/impacts of vehicles on the peninsula? How can the Service best facilitate the need to coordinate and communicate the different land managers and their policies? How can Service provide more, current information and signage to delineate boundaries, communicate Nantucket NWR's policies, and interpret natural resources without detracting from natural setting to community and visitors? How can we best partner with local organizations for interpretive programs, access opportunities and distribute information? | | | |
| **Objective 2.1 Visitor Use and Access** *(continued)* | • Annually protect existing piping plover habitat refugewide (Zones 1, 2, 3) by establishing and maintaining symbolic fencing preventing vehicular and pedestrian access through historic nesting habitat in accordance with Federal guidelines by April 1.<br>• Protect habitat for staging terns when it coincides with seal haul-out areas (generally Zone 3) by maintaining symbolic fencing and preventing pedestrian and vehicular access.<br>• Implement closures to protect seal haul-out sites (generally Zone 3) when at least 25 seals are present in the area using symbolic fencing. Viewing buffer distance of 50 yards is maintained in accordance with MMPA and Cape Cod Stranding Network guidelines. | *Within 3 years:*<br>• Apply for alternative transportation study funding to determine feasible access alternatives to the refuge with the goal of reducing the number of individually operated OSVs travelling to the refuge.<br>• Develop procedures for increasing and sharing of revenue and management responsibilities between the three conservation partners on the peninsula.<br>*Within 5 years:*<br>• Establish a pedestrian access trail from the lighthouse to the east beach in Zone 1 to provide pedestrian access to the beach and to protect dune ecosystem integrity.<br>• Engage the public in the alternative transportation system process so they can provide suggestions for transportation options and review of draft alternative transportation proposals.<br>*Within 10 years:*<br>• Obtain funds to implement preferred alternative transportation options. | |
| **Zone 1** | Always closed to pedestrians and vehicles to protect dune integrity. | Always closed to pedestrians and vehicles to protect dune integrity except proposed primitive foot trail located from lighthouse to E beach for pedestrian/fishing access. | *Same as alternative B.* |
| **Zone 2** | Open to vehicles and pedestrians, subject to nesting birds. | *Same as alternative A, though this zone encompasses less acreage than in alternative A.* | *Same as alternative A and B, though this zone encompasses less acreage than in alternative B.* |

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 2** *(continued)***. Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.** | | | |
| *Responds to Issues:* How can we best communicate, provide, and balance multiple Service objectives of habitat protection and management with public use and fishing access? How can we explore additional options to beach access including pedestrian and vehicle areas, boardwalk, shuttle, tours, etc. to provide additional experiences and programs while reducing number/impacts of vehicles on the peninsula? How can the Service best facilitate the need to coordinate and communicate the different land managers and their policies? How can Service provide more, current information and signage to delineate boundaries, communicate Nantucket NWR's policies, and interpret natural resources without detracting from natural setting to community and visitors? How can we best partner with local organizations for interpretive programs, access opportunities and distribute information? | | | |
| **Objective 2.1 Visitor Use and Access** *(continued)*<br>**Zone 3** | Closed to vehicles and pedestrians most of the year due to seals and staging terns. | *Same as alternative A.* | *Same as alternative A, but additionally closed to vehicles and pedestrians from April 1 to September 15 regardless of seal or bird use.* |
| **Zone 4** | *Not Applicable.* | Closed to vehicles from April 1 to July 1 or until bird nesting is completed. Mostly open to pedestrians, subject to nesting birds. | *Not Applicable.* |
| **Zone 5** | *Not Applicable.* | Closed to vehicles from August 1 to September 15, for staging terns. Mostly open to pedestrians, subject to nesting birds. Some pedestrian access allowed during this time. | *Not Applicable.* |
| **Zone 6** | *Not Applicable.* | *Not Applicable.* | Closed to vehicles from April 1 to September 15, regardless of bird use. Mostly open to pedestrians, subject to nesting birds. |

| **Refuge Resource or Program** | **Alternative A**<br>Current Management | **Alternative B**<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C**<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Objective 2.2 Environmental Education** | Maintain opportunities for environmental education programs and partnerships to communicate our knowledge and understanding of Nantucket's coastal ecosystems and the Federal trust resources that depend upon them.<br><br>*Continue to:*<br>• Rely on TTOR and other organizations (including Maria Mitchell) to conduct environmental education programs on Nantucket.<br>• Coordinate with partners for environmental education opportunities as staffing and funding allow. | Over the next 15 years, work with partners to develop and implement a quality environmental education program, based on existing curricula, and activities to highlight the benefit of landscape-level management, and to further communicate our knowledge and understanding of Nantucket's coastal ecosystems and the migratory birds, marine mammals and endangered and threatened species that depend upon them.<br><br>*In addition to those listed under alternative A (objective 2.1):*<br><br>*Within 1 year:*<br>• Provide resources and information upon request from partners and local organizations who conduct a coordinated environmental education program that highlights a landscape level conservation approach as well as on the refuge.<br>*Within 5 years*<br>• Coordinate with partners to refine an existing environmental education curriculum that highlights the importance of a landscape-level approach to resource management, to be provided both on and off the refuge, upon request. | *Same as alternative B, except conservation efforts are focused on Service lands.* |

| Refuge Resource or Program | **Alternative A** Current Management | **Alternative B** Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C** Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Objective 2.3 Interpretation and outreach** | Provide quality interpretation and outreach programs by continuing the current level of TTOR tours and identify opportunities for partnerships within the community that will increase awareness of the Service presence on Nantucket, and define how the biological resources that exist on Nantucket NWR exemplify the National Wildlife Refuge System (as existing staff allow).<br><br>*Continue to:*<br>• Rely on TTOR van tours to deliver the message about wildlife conservation and the Service's role on the Coskata-Coatue Peninsula.<br>• Coordinate with partners for interpretation and outreach opportunities as staffing and funding allow. | Over the next 15 years, provide quality interpretation and outreach programs by providing enhanced and increased tours of the peninsula, identify additional opportunities for partnerships within the community that increase awareness of the Service presence on Nantucket and define how the biological resources on Nantucket NWR contribute to the National Wildlife Refuge System.<br><br>*In addition to those listed under alternative A, objective 2.2:*<br><br>*Continue to:*<br>• Update and improve the Web site for Nantucket NWR.<br>• Establish and maintain Service-compliant regulatory signs.<br>• Develop community partnerships with elected officials, and Tribal, regional, local governments, and agencies to increase support for the refuge, and to strengthen our outreach capabilities.<br>• Explore opportunities for offsite interpretive displays and information, including the Maria Mitchell Association, other locations downtown.<br>*Within 1 year:*<br>• Develop primitive access trail through dunes where appropriate.<br>• Provide interpretive materials to partners.<br>• Coordinate with TTOR to install/use webcam at lighthouse to highlight/monitor wildlife and visitor activity.<br>*Within two years:*<br>• Develop quality seasonal interpretative programming in collaboration with partners.<br>• Collaborate with local nonprofit organizations to develop an interpretive guide for the peninsula within 2 years.<br>• Work with partners to develop and install interpretive panels at the lighthouse.<br>• Develop a wildlife list for all animal and plant taxa.<br>• Work with partners to develop brochures.<br>• Explore the acquisition of a (ADA compliant) Service van on the island available to Service staff on the island, and for partners to use for tours, etc. (magnetic decals).<br>*Within 3 years:*<br>• Create a general refuge brochure and rack card. Collaborate with partners for joint messages.<br>• Conduct seasonal interpretive walks on the refuge. | Over the next 15 years, provide focused interpretation programs by providing limited tours of the refuge to increase awareness of the Service presence on Nantucket, and define how the biological resource conservation on Nantucket NWR exemplifies the National Wildlife Refuge System. Within 3 years, develop Nantucket NWR information and messaging for additional, enhanced signage, materials, and tours which all highlight the protection and stewardship priorities of the refuge.<br><br>*Continue to:*<br>• Establish and maintain Service-compliant regulatory signs.<br>*Within 1 year:*<br>• Develop seasonal interpretation programming on the refuge.<br>• Develop access trail through dunes where appropriate.<br>• Provide information upon request from local organizations.<br>*Within 2 years:*<br>• Develop a wildlife list for all animal and plant taxa. |

| **Refuge Resource or Program** | **Alternative A** Current Management | **Alternative B** Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C** Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 2** *(continued)***. Promote awareness and stewardship of our coastal natural resources by providing compatible wildlife-dependent recreation and education opportunities, both on the refuge and within the local and visitor community on and around Nantucket Island.** | | | |
| *Responds to Issues:* How can we best communicate, provide, and balance multiple Service objectives of habitat protection and management with public use and fishing access? How can we explore additional options to beach access including pedestrian and vehicle areas, boardwalk, shuttle, tours, etc. to provide additional experiences and programs while reducing number/impacts of vehicles on the peninsula? How can the Service best facilitate the need to coordinate and communicate the different land managers and their policies? How can Service provide more, current information and signage to delineate boundaries, communicate Nantucket NWR's policies, and interpret natural resources without detracting from natural setting to community and visitors? How can we best partner with local organizations for interpretive programs, access opportunities and distribute information? | | | |
| **Objective 2.3 Interpretation and outreach** *(continued)* | | *Within 5 years:*<br>• Install interpretive panels and/or brochures on Steamship Authority ferries and/or at harbor visitor centers.<br>• Establish an annual tour of the refuge with elected officials.<br>• Work with partners to install a kiosk at the gatehouse, with interpretive panels (which includes information on partnerships, roles, rules, boundaries, and refuge system/refuge panels).<br>• Assist conservation partners with interpretation on their properties, particularly when that interpretation helps inform and educate the public about coastal resources and resources that are also specifically found on Nantucket NWR. | *Within 2 years (continued):*<br>• Collaborate with local nonprofit organizations to develop an interpretive guide for the Coskata-Coatue Peninsula.<br>• Create a general refuge brochure and rack card.<br>• Establish an annual tour of the refuge with elected officials.<br>*Within 3 years:*<br>• Conduct seasonal interpretive walks on the refuge.<br>*Within 5 years:*<br>• Collaborate with partners to develop a cooperative partnership building offsite, which will also provide Service housing quarters and a garage.<br>• Provide a brochure on Steamship Authority ferries and/or at harbor visitor centers. |

| Refuge Resource or Program | **Alternative A** Current Management | **Alternative B** Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C** Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Objective 2.4 Wildlife Observation and Photography** | Continue to provide the current level of quality, compatible opportunities for wildlife observation and photography daily for the public to enjoy and capture the refuge's wildlife and habitat diversity.<br><br>*Continue to:*<br>• Rely on TTOR to provide wildlife observation and photography opportunities through their tours.<br>• Provide daily, sunrise to sunset, access to the refuge as coordinated with and implemented by TTOR when possible.<br>• Coordinate with TTOR and other partners and volunteers to implement and maintain wildlife observation and photography opportunities. | Over the next 15 years, provide more quality, compatible experiences for the public to enjoy and capture the refuge's wildlife and habitat diversity. Within 5 years, develop additional opportunities for observation and photography of the wildlife and habitats on the refuge.<br><br>*In addition to those listed in alternative A objective 2.3:*<br><br>*Within 1 year:*<br>• Develop a primitive trail through refuge lands that keeps foot traffic on an established path.<br>• Work with partners to open the lighthouse at certain hours for photographic opportunities.<br>*Within 2 years:*<br>• Create a habitat/species checklist brochure.<br>*Within 3 years:*<br>• Identify and publicize the best locations and seasonal subjects for observation and photography (through brochures, at the kiosk, Web site, etc.).<br>*Within 5 years:*<br>• Work with partners to conduct an annual photography contest on Nantucket including a Youth Photo Contest. | Over the next 15 years, provide more compatible experiences for the public to enjoy and capture the refuge's wildlife and habitat diversity. Within 3 years, develop additional opportunities for observation and photography of wildlife and habitats on the refuge.<br><br>*Strategies are the same as alternative B except the refuge staff would not be involved with a Nantucket Island-wide photography contest.* |

| **Refuge Resource or Program** | **Alternative A** Current Management | **Alternative B** Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C** Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Objective 2.5 Fishing** | Continue to provide the current level of quality, compatible experiences when possible for those who come to the refuge for its unique fishing opportunities.<br><br>*Continue to:*<br>• Rely on TTOR for their current level of tours and other fishing events and activities.<br>• Allow diurnal and nocturnal fishing at the refuge as coordinated with and implemented by TTOR. | Over the next 15 years, continue to provide quality, compatible experiences for those who come to the refuge for its unique fishing opportunities. In the next 5 years, develop additional programs with the community and partners to provide quality fishing on the Coskata-Coatue Peninsula.<br><br>*Continue to:*<br>• Provide fishing access in appropriate Zones and date closures required by State and Federal law for habitat and species protection (see objective 1.1).<br>*Within 1 year:*<br>• Require commercial fishing tours/guides on refuge under special use permits.<br>• Post and distribute seasonal harvest and other current fishing information and regulations on the refuge kiosk and Web site.<br>*Within 2 years:*<br>• Work with partners to become involved with annual tournaments and provide increased Service presence.<br>*Within 3 years:*<br>• Conduct "Take Me Fishing" event for the general public, which is focused on children, in collaboration with the State and other partners. | Over the next 15 years, continue to provide quality, compatible experiences for those who come to the refuge for its unique fishing opportunities. In the next 3 years, allow compatible fishing opportunities along refuge shoreline. In the next 5 years, develop additional programs with the community and partners to experience and encourage fishing on the refuge.<br><br>*Same as alternative B except refuge staff would not be involved with fishing event and/or areawide tournament.* |

| Refuge Resource or Program | Alternative A<br>Current Management | Alternative B<br>Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | Alternative C<br>Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 3. Perpetuate and enhance long-term conservation and management of wildlife resources on and around Nantucket Island through partnerships and land protection with public and private landowners, Federal, State, and local entities.** | | | |
| *Responds to Issues:* How can the Service best protect additional Federal and non Federal lands (Some identified in preliminary Land Protection Plan such as inholdings, easement overlays possible with TTOR, Coast Guard and other Federal surplus properties)? How can we work with partners/community to coordinate management between adjacent land managers, for improved coordination and enforcement of policies through additional staff/ presence? How can we address the need for a protocol for cultural/archaeological resource protection? | | | |
| **Objective 3.1 Land Protection** | Working with partners, evaluate opportunities to protect important wildlife habitat within Nantucket County as the Service is notified of availabilities in Federal excess properties, and as funding and staffing allow.<br><br>• Evaluate land acquisition opportunities in cooperation with partners as the Service is notified of availabilities of excess Federal properties in the future. | Working with other Federal, State, and local partners, protect important wildlife habitat within Nantucket County by initiating protection of key habitats identified in a larger landscape approach within 3 to 5 years.<br><br>*Continue to:*<br>• Work with the town of Nantucket and other partners to protect the 195-acre Head of the Plains (former FAA property) as a no-cost transfer from the GSA.<br>• Work with the Coast Guard for right of first refusal for any Coast Guard properties, including acquiring the former Loran Station in Siasconset, Massachusetts (which includes potential housing and facility options).<br>*Within 1 year:*<br>• Send official letter from the Service to the Coast Guard documenting Service interest in acquiring the Great Point Lighthouse as a no-cost transfer from the Coast Guard.<br>• Send official letter from the Service to the Coast Guard documenting Service interest in acquiring the Nantucket Loran Station as a no-cost transfer from the Coast Guard.<br>*Within 3 years:*<br>• Work with partners (TTOR and NCF) and the National Park Service to pursue designation of Natural National Landmark for the Coskata-Coatue Peninsula.<br>• Work with partners to enhance the protection of adjacent conservation lands currently owned by the NCF (589 acres) and The Trustees of the Reservations (911 acres) through conservation easements and management agreements.<br>• Work with the town of Nantucket, the Nantucket Land Bank, the Nantucket Land Council, and the Crocker Snowe family to protect the 175-acre Muskeget Island and to cooperatively manage the wildlife resources on the island. | *Same as alternative A.* |

| **Refuge Resource or Program** | **Alternative A** Current Management | **Alternative B** Enhanced Wildlife Management and Visitor Services (Service-preferred Alternative) | **Alternative C** Wildlife Diversity and Natural Processes Emphasis |
|---|---|---|---|
| **Goal 3** *(continued)***. Perpetuate and enhance long-term conservation and management of wildlife resources on and around Nantucket Island through partnerships and land protection with public and private landowners, Federal, State, and local entities.** | | | |
| *Responds to Issues:* How can the Service best protect additional Federal and non Federal lands (Some identified in preliminary Land Protection Plan such as inholdings, easement overlays possible with TTOR, Coast Guard and other Federal surplus properties)? How can we work with partners/community to coordinate management between adjacent land managers, for improved coordination and enforcement of policies through additional staff/ presence? How can we address the need for a protocol for cultural/archaeological resource protection? | | | |
| **Objective 3.1 Land Protection** *(continued)* | | *Within 5 years:*<br>• Work with the town of Nantucket to acquire portions of the town owned property at Lower Beach Road through land exchange with the town of Nantucket.<br>*Within 10 years:*<br>• Work with the owners of the current Lohmann and Jellamie properties for long-term protection of these properties through fee title, land exchange, conservation easement, or develop a management agreement.<br>• Pursue acquisition and/or Management Agreement of the Eel Point property and The Creeks area currently owned by the NCF.<br>• Work with partners to explore options along bus/ bike route to acquire property for a joint visitor contact station on or off the refuge. | |