Purpose of and Need for Action

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INTRODUCTION

Since the late 1960s, the white-tailed deer (*Odocoileus virginianus*) population at Fire Island National Seashore (the Seashore) has expanded, leading to severe negative impacts on vegetation and cultural landscapes and an increase in undesirable human-deer interactions. As a result, the National Park Service (NPS) is preparing this White-tailed Deer Management Plan and Environmental Impact Statement (plan/EIS). The plan/EIS evaluates a range of alternative strategies and methods for white-tailed deer management, examines existing resource conditions, and analyzes the potential impacts on these resources as a result of the proposed management options. The plan/EIS complies with the National Environmental Policy Act of 1969 (NEPA), its implementing regulations (40 CFR [Code of Federal Regulations] 1500–1508), Department of the Interior (USDI) NEPA regulations (43 CFR 46), the NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011c), and the accompanying Director's Order 12 Handbook (NPS 2001).

The plan/EIS has been prepared in cooperation with the New York State Department of Environmental Conservation (NYS-DEC) and the U.S. Department of Agriculture Animal and Plant Health Inspection Services. In addition, a team of agency scientists and subject matter experts (the science team) assisted with the planning process by evaluating scientific literature and research on the topics of deer management, human-deer interactions, and vegetation management; and reviewing and recommending monitoring protocols for deer populations, vegetation, and other Seashore resources. The National Park Service has used this information, results from public scoping, and recommendations from individuals with professional expertise to create a full range of alternatives to achieve the purpose, need, and objectives for the plan/EIS. The alternatives are adaptive and dynamic, allowing the National Park Service to consider new scientific information and make changes in management actions over time.

The "Purpose of and Need for Action" chapter explains the intent of the plan/EIS for the Seashore and the reason the National Park Service is taking action at this time. Ultimately, upon conclusion of the planning and decision-making process, an alternative will be selected and will guide the long-term management of white-tailed deer at the Seashore using an adaptive management approach.

PURPOSE OF AND NEED FOR ACTION

PURPOSE OF THE PLAN/EIS

The purpose of the plan/EIS is to develop a deer management strategy that supports protection, preservation, regeneration, and restoration of native vegetation and other natural and cultural resources at the Seashore and reduces undesirable human-deer interactions in the Fire Island communities. The plan/EIS is also intended to promote public understanding of the complex relationship between deer and Seashore resources, tick-borne diseases, people, and infrastructure.

NEED FOR ACTION

Seashore staff have been working to understand and address issues linked to the deer population on Fire Island for 30 years. Information collected as part of the research conducted at the Seashore indicates the need for a management plan to address impacts associated with changes in white-tailed deer abundance, distribution, and behavior, including the following:

- adverse impacts on native vegetation resulting from heavy browsing by white-tailed deer
- adverse impacts on natural and cultural resources at the William Floyd Estate resulting from heavy browsing by white-tailed deer
- adverse interactions between deer and humans and the developed environment as a result of
  - the presence of abundant food sources (including naturally occurring vegetation, unsecured garbage, intentional feeding, gardens, ornamental landscaping), and shelter in the Fire Island communities
  - habituation of deer to the unthreatening presence of humans and conditioning of deer, particularly to food sources, in the Fire Island communities and high-visitor use areas

At current levels, deer browsing in the Sunken Forest and other vegetated areas of the Seashore is reducing the abundance and diversity of native vegetation, including important understory species. The Sunken Forest is a globally rare ecological community on Fire Island where heavy browse pressure from deer has clearly adversely impacted forest regeneration and the species diversity and abundance of herbaceous vegetation. Management of this particular holly maritime forest is an important component of the plan/EIS in keeping with the Seashore's enabling legislation, which specifically calls out the protection of the Sunken Forest Preserve. The relationship between the Sunken Forest and the Sunken Forest Preserve are described later in this chapter. The vegetation composition and structure of the Sunken Forest was documented in 1967 prior to the deer population irruption on Fire Island. The study provides a comprehensive description of percent herbaceous cover, shrub and tree species, and their densities (Art 1976).

Additionally, current levels of browsing by deer at the William Floyd Estate are resulting in the degradation of elements of the cultural landscape, particularly ornamental plantings in the West Garden and natural vegetation in the surrounding woodland. In the West Garden, deer browse inhibits the maintenance of the gardens as they existed in the early 20th century. In the woodlands surrounding the lower acreage, deer browse reduces natural vegetation regeneration. The high concentration of deer at the William Floyd Estate also contributes to the perceived risk of tick-borne diseases, which may affect visitation at the site.

Seventeen communities are within the Seashore boundary but are not situated on federally owned land (figure 1). Deer reside within these communities, having established a common presence that some residents and visitors have come to enjoy, while others consider it a nuisance (Leong and Decker 2007). Behavioral shifts have occurred (both by deer and humans) over the years because the deer have become habituated to humans and conditioned to human food. This has led to undesirable human-deer interactions such as deer approaching humans, people intentionally feeding deer, people unintentionally feeding deer via unsecured garbage or ornamental plants, deer using residential storage areas and lower house levels as shelters, and negative dog-deer interactions. These undesirable interactions raise the risk of human injury by physical contact with deer and increase the likelihood of property damage by deer. In addition, higher numbers of deer and a limited understanding of the relationship between deer and tick-borne diseases promote the perception by Fire Island community residents of a higher risk of contracting Lyme disease. Other concerns include interactions with pets and injury to deer from fences.

White-tailed Deer Management Plan and Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Fire Island National Seashore

FIGURE 1
Project Vicinity Map

Human-deer Interaction (Photo credit: NPS)

OBJECTIVES IN TAKING ACTION

Objectives help define what must be achieved for the National Park Service to consider the plan a success, help shape the range of alternatives for management options, and set the framework for the analysis of alternatives. For the plan/EIS, objectives have been established for the entire Seashore, and more specific objectives have been developed for the Sunken Forest, the Fire Island communities, and the William Floyd Estate. The objectives for deer management at the Seashore have been developed to achieve certain conditions throughout the Seashore as a whole and to achieve certain resource conditions at specific areas within the Seashore, as described below:

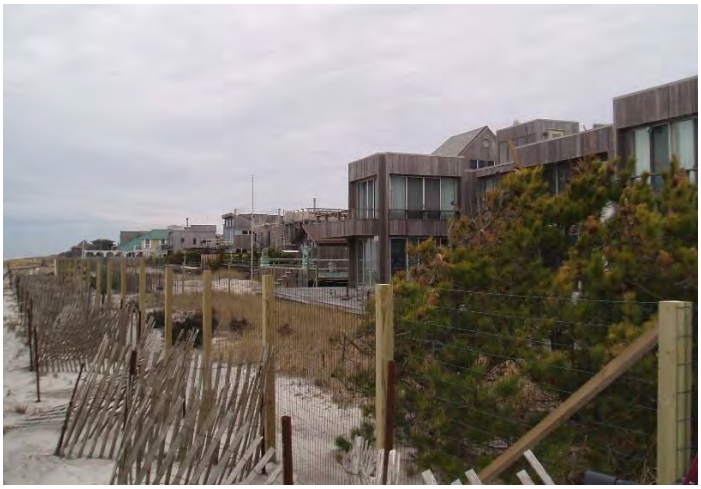
- Manage a viable white-tailed deer population in the Seashore that is supportive of the other objectives for this plan/EIS.
- Promote natural regeneration of native vegetation.
- Protect special-status species/vegetation communities and their habitat from high levels of deer browsing.
- Work collaboratively with other land management agencies on issues associated with abundance, distribution, and behavior of white-tailed deer at the Seashore.
- Improve public understanding of the issues such as human-deer interactions, the impact of white-tailed deer on the cultural and natural resources of the Seashore, and tick-borne diseases throughout the Seashore, including the William Floyd Estate.
- Continue to expand the knowledge base regarding the relationship between deer browsing and plant communities at Fire Island National Seashore to improve management decisions.
- Within the Sunken Forest, maintain the character of the globally rare maritime holly forest, as stated in the Seashore's enabling legislation, by fostering the regeneration of key canopy constituent tree species and a reasonable representation (as defined in the desired conditions description below) of herbs and shrubs that made up the Sunken Forest's vegetative composition when the Seashore was established.
- Reduce the potential for undesirable human-deer interactions both within the Fire Island communities and at other developed areas of the Seashore.
- Manage deer browse to allow for the restoration and preservation of the cultural landscape of the William Floyd Estate and for the regeneration of the forest within the lower acreage of the William Floyd Estate.

DESIRED CONDITIONS

The National Park Service defines desired conditions as resource conditions that the National Park Service aspires to achieve and maintain over time, and the conditions necessary for visitors to understand, enjoy, and appreciate those resources. The National Park Service has established different desired conditions for different portions of the Seashore influenced by how the deer herd is impacting the natural resources and visitor experience. This section describes the desired conditions, which provides the baseline for what the Seashore wishes to achieve in each of the geographic areas.

FIRE ISLAND COMMUNITIES

An important component of this plan would be improving the cooperative effort between the Fire Island communities and the Seashore in addressing the behaviors of residents and vacationers who promote food conditioning of deer. During the 2008–2011 deer density counts, biologists recorded instances in which deer were being fed by humans or foraging through unsecured garbage. During surveys, approximately 11% of deer were observed feeding from overturned trashcans, and approximately 11% of deer were being directly fed by a person. A desired condition of the Seashore is to reduce these undesirable human-deer interactions within the Fire Island communities (NPS 2011a).



Private residences in a Fire Island community
(Photo credit: VHB)

SUNKEN FOREST

The vegetation composition and structure of the Sunken Forest (including percent herbaceous cover, shrub and tree species and their densities) was documented in 1967 prior to the deer population irruption on Fire Island (Art 1976). The science team recommended that the Seashore use this report as a baseline to establish desired vegetation conditions for the Sunken Forest. Therefore, the desired condition is to maintain the character of the Sunken Forest, as stated in the Seashore's enabling legislation, by fostering the regeneration of key canopy constituent tree species and a reasonable representation of herbs and shrubs reminiscent of its floristic composition when Fire Island National Seashore was established (NPS 2011b).

FIRE ISLAND NATURAL AREAS

Natural areas of local and regional importance (other than the Sunken Forest and William Floyd Estate) occur on Fire Island. These areas include maritime forests at the Carrington Estate, Talisman, Blue Point, and in the Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness). Seashore managers wish to sustain naturally regenerating forests. While these areas

do not have defined vegetation targets, the vegetation monitoring completed before the implementation of this plan/EIS will help seashore mangers detect a response in the vegetation following management. Therefore, the Seashore has set the desired condition in these areas would be to see a positive response in vegetation an increase in species diversity.

WILLIAM FLOYD ESTATE

The 613-acre William Floyd Estate (figure 2) consists of the historic house and surrounding fields of about 20 acres ("historic core" area), forests ("lower acreage"), small fields scattered among the forest setting, and a broad marsh associated with Narrow Bay. The historic core area of the William Floyd Estate experiences browsing impacts by deer at a level that causes repeated mortality of ornamental plants. Desired conditions for landscaping would be focused primarily on the historic core area. Specific character-defining features of vegetation at the William Floyd Estate are identified in the cultural landscape inventory (NPS 2006b), including the lopped tree line, the West Garden, a small orchard in the West Garden, planted trees southwest of the Mastic House, and ornamental trees and shrubs. A desired condition is sustainable management of those same ornamental plants or comparable alternatives and full restoration of the character of the historic core area for aesthetics and public interpretation. The Seashore would also like to promote native forest regeneration, particularly oaks and hickories within the William Floyd Estate forests.

Orchard trees on the William Floyd Estate (Photo credit: NPS)

White-tailed Deer Management Plan and Environmental Impact Statement

National Park Service
U.S. Department of the Interior

Fire Island National Seashore

FIGURE 2
William Floyd Estate

DESCRIPTION OF FIRE ISLAND NATIONAL SEASHORE

PROJECT LOCATION

Established in 1964, the Seashore encompasses 19,579 acres of upland, tidal, and submerged lands along a 26-mile stretch of the 32-mile barrier island–part of a much larger system of barrier islands and bluffs stretching from New York City to the very eastern end of Long Island at Montauk Point. The Seashore is located in Suffolk County in southeastern New York State, on the south shore of Long Island, approximately 70 miles east-southeast of New York City. An extensive dunes system, centuries-old maritime forests, and solitary beaches are easily accessed on Fire Island. Also on Fire Island, within the boundary of the Seashore, are 1,381 acres of federally designated wilderness and the Light House Annex. Nearby on Long Island, also part of the Seashore, is the William Floyd Estate, the home of one of New York's signers of the Declaration of Independence.

On Long Island, the Seashore's headquarters are located in Patchogue and include administrative offices, a maintenance facility, and a ferry terminal. The William Floyd Estate is located on the southern coast of Long Island, in the village of Mastic Beach. Facilities at the William Floyd Estate include structures to accommodate visitors, maintenance equipment, and curatorial storage. The barrier island (Fire Island) is separated from Long Island by the Great South Bay and is bordered by the Atlantic Ocean to the south, Fire Island Inlet to the west, and Moriches Inlet to the east. Upland areas of the Seashore include 26 miles of the barrier island beginning at Moriches Inlet west to the boundary of Robert Moses State Park, an average of less than 1 mile wide, and the approximately 613-acre William Floyd Estate (NPS 2012b). The waters of the Great South Bay account for approximately 15,000 acres of the Seashore. The bottom lands of the Great South Bay are owned by the towns of Brookhaven and Islip and the Nature Conservancy (NPS 2012b).

Three breaches that formed on Fire Island during Hurricane Sandy in 2012, and one still remains. The open breach is located in an area known as Old Inlet toward the eastern portion of the Fire Island Wilderness. This open breach migrated rapidly westward over the winter storm season of 2012–13 following Hurricane Sandy, but since then it has remained relatively stable.

On Fire Island, interspersed within the Seashore are 17 private residential communities established before the Seashore's authorization. Resort development on Fire Island began as early as 1855, with a number of the communities having been established prior to the Great Depression of the 1930s. While the Fire Island communities lie within the administrative boundary of the Seashore, the Seashore has limited authority over the Fire Island communities and does not directly manage them. Some Fire Island communities are legally incorporated as independent governmental entities with elected officials, and others have legal ties to towns and other communities on Long Island. The Seashore's enabling legislation includes provisions for private land to be retained or developed if zoning requirements are met. No hard-surfaced roads connect the Fire Island communities, either to each other or to Long Island. They are accessible mainly by passenger ferry or private boat. Off-road vehicle use is restricted within the boundary of the Seashore on Fire Island. Without paved roads and with limited traffic, the Fire Island communities have retained much of their original character. Some of the Fire Island communities have hotels or facilities for overnight guests, while others are strictly residential. There are approximately 4,100 developed properties on Fire Island with approximately 300 residents living on Fire Island year-round. The number of year round residents has slowly and steadily declined in recent years. Vehicle access is limited to year-round residents, contractors and other service providers (telephone, fuel, garbage, etc.); all vehicles crossing federal lands must have an NPS driving permit.

During the summer season, the population of Fire Island swells to approximately 30,000, with a total of 2–3 million visitors arriving each year. Recreational visitation to sites and facilities owned or managed by the Seashore in 2011 was 520,000. The Seashore's primary visitor facilities located on Fire Island are the Light House Annex, Sailors Haven, Watch Hill, and the Fire Island Wilderness. Light House Annex is maintained and operated by the Fire Island Lighthouse Preservation Society, which offers tours and other visitor programs. Concessioners operate the marina at Sailors Haven as well as the marina and campground at Watch Hill. The Seashore maintains visitor services facilities at the eastern edge of the Fire Island Wilderness, Sailors Haven, Talisman, and Watch Hill. The Seashore offers lifeguarded swimming areas at Sailors Haven and Watch Hill. Also located on Fire Island are ranger stations, visitor contact facilities, maintenance facilities, and several units of Seashore housing. Located at either end of Fire Island are major state and county beaches with sizable visitation that are accessible by vehicle.

PURPOSE AND SIGNIFICANCE OF FIRE ISLAND NATIONAL SEASHORE

Purpose

Together with the Fire Island communities, government agencies, and other partners, the Seashore conserves, preserves, and protects for the use and appreciation of current and future generations relatively unspoiled and undeveloped beaches, dunes, and other natural features and processes. These include Fire Island's larger landscape and its surrounding marine environment. These resources possess high natural and aesthetic values to the nation as examples of great natural beauty and wildness in close proximity to large concentrations of urban population. The Seashore also conserves, preserves and protects the historic structures, cultural landscapes, museum collections and archeological resources associated with the Seashore including the Fire Island Light Station and the William Floyd Estate. Finally, the Seashore preserves the primitive and natural character of the Otis Pike Fire Island High Dune Wilderness and protects its wilderness character.

Significance

Fire Island National Seashore is part of a barrier island system encompassing relatively unspoiled and undeveloped beaches, dunes, marine environment and other natural features and dynamic processes within close proximity to the largest concentration of population of any national seashore in the United States. The dynamic barrier island environment of Fire Island has attracted and influenced a variety of human uses over hundreds of years. It has also been shaped by this continuum of human involvement, giving rise to the distinctive relationship between the built and natural environments. The resources which determine the Seashore's national significance include the following:

- The Sunken Forest, a 250-300 year old American holly-shadblow-sassafras maritime forest, is a globally rare and important habitat in the Northeastern United States.
- Fire Island National Seashore provides important habitat for marine and terrestrial plants and animals, including a number of rare, threatened and endangered species.
- Situated along the Atlantic Flyway, Fire Island is a globally important area for more than 330 migratory, over wintering and resident bird species.
- The Otis Pike Fire Island High Dune Wilderness, the only federally designated wilderness in New York State, lies within the most populous metropolitan area in the United States, offering a rare opportunity for a broad spectrum of the American public to experience wilderness.

- Owned and occupied by the Floyd Family from 1720 to 1976, the William Floyd Estate was the home of General William Floyd, a signer of the Declaration of Independence.

Fire Island Light was constructed in 1858 and has served as a critical navigation aid for the port of New York for more than 150 years. An active light has been at this location since 1826.

SCIENTIFIC BACKGROUND: DEER AND VEGETATION MANAGEMENT

Seashore concerns over the Fire Island deer population were initially focused around a noticeable increase in the number of deer within the Fire Island communities and the incidence of Lyme disease among Fire Island residents. Impacts of deer browsing on vegetation were also among the major concerns. In the mid-1980s, researchers documented a substantial decline in the diversity and abundance of key plant species in the Sunken Forest, one of the Seashore's rarest plant communities. As a result, Seashore staff along with academic and agency scientists embarked on a series of additional investigations documenting and describing the following:

- deer abundance and distribution across Fire Island
- fertility control as a potential deer population management tool
- browsing impacts on vegetation
- the role of disturbance on the regeneration capacity of the Sunken Forest and the likelihood of its future conservation
- ecology of Lyme disease and its vector-host relationships including ticks, birds, and mammals
- the human aspects related to white-tailed deer issues on Fire Island

More recently, Seashore staff have focused on the threat posed by deer to native vegetation in other natural zones of the Seashore and the cultural landscape of the William Floyd Estate. NPS staff have recently initiated collection of vegetation data in some of the Seashore's valued maritime forests to establish baseline understory conditions, and the preliminary evaluation of the data collected thus far indicates that deer browsing impacts have affected the ability for seedlings and saplings to develop similar to the conditions at the Sunken Forest. In some areas, current levels of browsing appear to be creating conditions for an increase in undesirable species. The loss of native vegetation and overall change in the vegetation communities could result in impacts on other wildlife species, such as ground-nesting birds and small mammals using these areas for food and shelter.

DEER AND VEGETATION MANAGEMENT ISSUES AND RESEARCH OVERVIEW

Population and Ecological Characteristics of White-tailed Deer at the Seashore. Prior to the establishment of the Seashore in 1964, very few deer occupied Fire Island (O'Connell 1989). It is likely that the early deer population expanded from the remote natural areas on the eastern side of Fire Island to the western side because deer were attracted to artificial food sources (e.g., gardens, garbage, lawns) in Fire Island communities (Underwood 2005). By the 1970s and 1980s the deer population had become established in the Fire Island communities due to high survival rates and the availability of high-quality habitats (Underwood 1991). As a result, the Seashore began to take steps toward better understanding the deer population and impacts on Seashore resources.

Over the decades, deer abundance has been estimated using different techniques. In the mid-1980s the Seashore initiated a program to estimate the herd size using low-level helicopter surveys. Later, distance sampling was used to estimate deer density. The change in methodologies occurred because individual deer could not be seen in the dense Fire Island communities from the helicopter, and because distance sampling is ground-based and statistically accounts for not seeing all individuals, it was considered more accurate. The deer population peaked in the mid-1990s, when the deer density on Fire Island exceeded 257 deer per square mile in some areas (Underwood 2005).

According to Seashore staff, few if any deer occupied the William Floyd Estate when the property was donated to the National Park Service in 1976. Distance sampling data collected in 2012 estimated the deer population to be approximately 106 deer per square mile at the William Floyd Estate (NPS 2013d). The latest deer density estimates (2012) for the Seashore are provided in table 1.

TABLE 1. DEER POPULATION ESTIMATES FOR PORTIONS OF FIRE ISLAND NATIONAL SEASHORE (2012)

Location	Deer Density (deer per square mile)	Number of Deer
Robert Moses State Park	70	60
Lighthouse Tract	10	2
Kismet-Lonelyville	227	80
Ocean Beach – Ocean Bay Park	126	37
Sailors Haven-Sunken Forest	112	27
Fire Island Pines	149	26
Davis Park	137	10
Fire Island Wilderness	54	91
William Floyd Estate	106	96

Source: NPS 2013b

Little is known about individual deer movements at the Seashore. Telemetry data on 20 deer from the 1980s documented one instance of deer moving off Fire Island and rare instances of deer travelling long distances across Fire Island, but in general, most deer (particularly females) remained in smaller, established home ranges, typically 1.5 miles in length (O'Connell and Sayre 1988). Although some deer may occupy a home range that includes both Fire Island communities and natural areas, scientists do not know the frequency or timing of movements between those areas.

The 1980s movement data (described above) appeared to strongly suggest a separation between deer on the western side of the Fire Island Pines/Talisman and the deer on the eastern side. O'Connell and Sayre (1989) found differences in behavior, population densities, and body condition between deer populations on the western and eastern parts of Fire Island. Deer on the western end had higher body weights from nutritional benefits within the Fire Island communities (from artificial food sources such as ornamental plants, gardens, and intentional feeding) and were much more habituated to humans, whereas deer on the eastern side of the Fire Island had lower body weight, and many exhibited a flight response when approached by humans (O'Connell and Sayre 1989; Underwood 2005).

Long-term Vegetation Monitoring and Research

Sunken Forest Vegetation. The Sunken Forest is a globally rare, old-growth maritime holly forest approximately 44 acres in size located within the Sailors Haven area, just west of Sailors

Haven marina. In 1960, a ±50-acre tract of land comprising beach foredunes, backdunes, and a portion of the Sunken Forest was dedicated for protection as an ecological sanctuary by a private group. Two years after the Fire Island National Seashore was established in 1964, this 50-acre property was deeded to the Seashore, and is referred to in the deed documents as the "Sunken Forest Preserve." The Sunken Forest, due to its uniqueness and rarity as a forest ecosystem, was highlighted in the Seashore's enabling legislation for preservation and protection. It should be noted that the term "Sunken Forest," as used throughout this document, refers to the 44-acre acre maritime holly forest, and as noted above, this forest is only partially contained in the area designated as the Sunken Forest Preserve.

The Seashore has conducted vegetation studies in the Sunken Forest for more than 45 years, and deer impacts on vegetation in the Sunken Forest have been observed over the last 30 years. Researchers have observed impacts on woody seedling densities and understory species composition attributed to heavy browsing (Art 1976, 1987, 1990; Forrester, Leopold, and Art 2007; Forrester, Leopold, and Underwood 2008; Underwood, Ries, and Raphael 2011).

In particular, scientists noted the absence of several herbaceous plants in later years (Forrester 2004) that were present during the initial studies (Schulte 1965; Art 1976). Regeneration of important canopy constituents (trees that make up the overstory) was also absent, particularly American holly (*Ilex opaca*). In comparison, more deer-resistant plants such as black cherry (*Prunus serotina*) were thriving, indicating a potential shift in canopy species over time.

An additional study (Forrester, Leopold, and Underwood 2008) used exclosures to conclude that deer are the dominant herbivore in the Sunken Forest. Past data sets compiled by the science team indicate that changes in the density of shrub layer species correspond to changes in the deer density for the same time interval. The data sets indicate that much of the impacts on vegetation from heavy browsing had already occurred by the mid-1980s. These impacts from heavy browsing by white-tailed deer continue today.

Seashore staff conducting research (Photo credit: NPS)

The Seashore has initiated the collection of vegetation data within other maritime forests and the William Floyd Estate forests to establish baseline conditions for future monitoring (NPS 2013e; NPS 2013f). Although evaluation of the data is preliminary, the data suggests a species composition shift is occurring to favor those tree species most avoided by deer (NPS 2013f), and because of deer browse, there is not sufficient recruitment of tree seedlings to sustain natural reproduction of the overstory canopy.

Human-Deer Interactions. Fire Island community residents and residents adjacent to the William Floyd Estate expressed the types of deer impacts they experience, including human-deer interactions, by participating in a study in which they were interviewed (Leong and Decker 2007) and/or completing a mail survey (Siemer et al 2007). The primary concerns were related to impacts associated with the deer population size and density, home range and movements, and behavior.

Impacts on residents include damage to landscaping and gardens; concerns about disease and ticks; sanitation issues; wildlife viewing opportunities; concerns about deer health; and interactions with pets; but also include concerns about impacts on deer such as habitat loss and behavior changes. Seashore staff have also documented human-deer interactions when notified and when a particular action was taken.

Previous Deer Management Efforts and Research

In 1988–89, the Seashore, in cooperation with New York State, introduced a public research hunt as a means to lower deer numbers in response to the deer population expansion at the Seashore. This hunt evaluated shotgun and archery hunting as methods of deer management, and collected information on the physical condition of the deer population (O'Connell and Sayre 1989). A questionnaire was also provided to participating hunters. Archery hunts occurred in the natural areas on the western side of Fire Island and firearms were permitted in the Fire Island Wilderness. Archery hunting began on December 17, 1988, and ended on December 23, 1988. Firearms hunting began on January 9, 1989, and ended on January 18, 1989. A total of 54 deer were harvested. However, problems with the logistics of the hunt included hunters dealing with dense vegetation, logistics of hunters gaining access to portions of the island, and unwillingness of hunters to disregard sex and size in harvesting deer. Body weights and reproductive rates were much lower than deer on the rest of Long Island. Furthermore, the program quickly became unpopular with Fire Island residents (Knoch and Lowery 1989).

The Fire Island communities funded a study through The Humane Society of the United States to evaluate the viability of immunocontraception as a newly emerging form of deer population control, out of concern about the linkage between deer abundance and tick-borne diseases and a desire to use nonlethal methods. This program began in 1993 and ended in 2009, lasting 16 years. With the assistance of Seashore staff, scientists conducted deer density counts using distance sampling within the Fire Island communities to evaluate the effectiveness of immunocontraception in reducing deer population density. Population surveys were performed annually during the course of the study and are ongoing. No immunocontraception occurred east of Fire Island Pines or at the William Floyd Estate. Population trend data gathered by Underwood (2005) showed that the population response was varied, but certain localized Fire Island communities with the longest history of immunocontraceptive treatments were associated with an approximate 50% decrease in population size over the 16 year study.

In 2005, the Seashore published a technical report entitled *White-tailed Deer Ecology and Management on Fire Island National Seashore* (Underwood 2005) that reviewed the subject of white-tailed deer at the Seashore, including deer population trends and movements, impacts on barrier island vegetation, and management recommendations. The report also included information on the ecological impacts caused by the abundance of deer.

Management Plan for White-tailed Deer in New York State

In 2009, the New York State Department of Environmental Conservation began development of a statewide deer management plan. The plan was designed to document the components of the state's deer management program and provide strategic direction for deer management within the state over a five-year period. The plan was developed with consideration of the diverse interests and values of the public, biological needs of deer, and the ecological relationship between deer and their environment. To that end, scientific data related to deer, public input, and the results of associated surveys were considered and incorporated into the recommendations and management actions included in the plan. The final *Management Plan for White-tailed Deer in New York State*

2012–2016 was completed in October 2011. Deer management efforts at the Seashore would be undertaken in consideration of NYS-DEC's plan. The primary goals of the plan are the following:

- manage deer populations at levels appropriate for human and ecological concerns
- promote and enhance deer hunting as an important recreational activity, tradition, and management tool in New York
- reduce the negative impacts caused by deer
- foster understanding and communication about deer ecology, management, economic aspects, and recreational opportunities while enhancing NYS-DEC's understanding of the public's interest
- manage deer to promote healthy and sustainable forests and enhance habitat conservation efforts to benefit deer and other species
- ensure that the necessary resources are available to support the proper management of white-tailed deer in New York (NYS-DEC 2011)

Previous Tick Management Efforts Related to Deer

In 2011 Cornell University completed a three-year study on the use of 4-Poster baiting stations to treat deer with the pesticide permethrin when they feed, with the intent of killing ticks on the deer. The baiting stations were located on nonfederal lands on Fire Island and used whole kernel corn as a lure to attract the deer. In January of 2012, the New York State Department of Environmental Conservation registered 4-Poster Tickicide along with assigning a special local need supplemental labeling for the device. This resulted in two Fire Island communities located within Fire Island National Seashore's boundaries requesting deployment of a total of three devices; two devices in the village of Saltaire and one device in Fair Harbor. The Seashore issued a Letter of Authorization for both communities as requested. From 2008 through 2012, deer consumed 28 tons of whole kernel corn at the Saltaire devices, with 11.2 tons distributed in 2012 alone (NPS 2013a).

4-Poster Device (Photo credit: NPS)

The National Park Service continues to reject the use of the 4-Poster devices on federal lands because the devices provide a regular, introduced food source for the deer population, in contradiction of NPS *Management Policies 2006*. The National Park Service has concerns, policies, and regulations against the supplemental feeding of wildlife, and is particularly concerned with the white-tailed deer population on Fire Island. The Fire Island communities may seek to continue this program.

SCOPING, ISSUES, AND IMPACT TOPICS

SCOPING

Early in the development of this plan/EIS, the National Park Service conducted meetings internally. Cooperating agencies were invited to assist with preparation of this document, and a science team convened to inform the planning process. The National Park Service also distributed consultation letters to relevant agencies (appendix A) and organized groups, issued press releases and newsletters, and solicited public comments during the scoping phase. A summary of scoping, agency consultations, and public involvement is provided below, and a detailed description is provided in "Chapter 5: Consultation and Coordination."

Internal Scoping and Planning

The National Park Service held internal meetings in October 2010 to provide an opportunity for the NPS to initiate the NEPA planning process and discuss the management of white-tailed deer and vegetation at the Seashore. Attendees included interdisciplinary team (IDT) members from the NPS Denver Service Center (DSC), NPS Northeast Region office, NPS Biological Resources Management Division, U.S. Geological Survey Patuxent Wildlife Research Center, the Seashore, and NPS consultants. Topics discussed during the meeting included the purpose, need, and objectives; public and agency involvement; potential issues; preliminary alternative elements; and data needs.

This group met again in December 2011, June 2012, and January 2014 to develop and refine the alternatives that are considered in this plan/EIS. The group reviewed the purpose, need, and objectives for the plan/EIS as well as potential constraints, potentially available management techniques, and public and science team suggestions to compile a full spectrum of potential alternatives. The alternatives that best met the objectives of the plan/EIS were included in this document.

The internal scoping process continued throughout the development of the plan/EIS through regular conference calls and meetings.

Cooperating Agencies

Two agencies have entered into an agreement with the National Park Service to be cooperating agencies in the development of the plan/EIS: New York State Department of Environmental Conservation and United States Department of Agriculture Animal and Plant Health Inspection Services. Both of these cooperating agencies have special technical expertise related to the issues under consideration in the plan/EIS and participate in regular status calls. Both agencies also attended the June 2012 and January 2014 meetings to develop and refine the alternatives considered in the plan/EIS.

Science Team

The National Park Service assembled a science team to answer technical questions posed by the IDT and to provide recommendations for use in the development of alternatives as part of the plan/EIS. The team was composed of national, regional, and local experts from the National Park Service, other agencies, and academia with expertise in the Seashore and its ecosystems, the management of natural resources (including deer) and cultural landscapes, and related social issues (see the List of Preparers in chapter 5). The science team participated in regular phone meetings

over an eight-month period to answer technical questions posed by the IDT and provide information for use in development of the plan/EIS. Following the science team's final meeting, an internal report was prepared to document the group's discussions. This report was used to inform the development of the alternatives presented in "Chapter 2: Alternatives."

Public Scoping and Outreach

The Notice of Intent to prepare the plan/EIS was published in the *Federal Register* on June 17, 2011, representing the beginning of the public scoping and outreach process. In addition, a newsletter with background information and the purpose, need, and objectives associated with the plan/EIS was mailed to known stakeholders and posted on the NPS Planning, Environment, and Public Comment (PEPC) website (http://parkplanning.nps.gov/fiis). The newsletter included information about how to provide comments either through PEPC or using standard mail. The public comment period closed on July 18, 2011. A total of 12 pieces of correspondence were received during the public comment period, comprising approximately 90 comments. Comments received during the public scoping process helped to inform the range of alternatives, as well as the impact topics to be addressed by the EIS. "Chapter 5: Consultation and Coordination" of this EIS provides more details about the public scoping activities, which were an integral part of the planning process for this EIS. Two additional newsletters were posted during the project to update the public on project status.

IMPACT TOPICS RETAINED FOR FURTHER ANALYSIS

As a result of this scoping effort, several issues were identified as requiring further analysis in this plan/EIS. These issues represent existing concerns as well as concerns that might arise during consideration and analysis of alternatives. To focus the environmental analysis in this plan/EIS, the issues identified during scoping were used to derive a number of impact topics, which are resources of concern that could be affected, either beneficially or adversely, by implementing any of the proposed alternatives. The impact topics are outlined below. The existing conditions associated with each impact topic are described in "Chapter 3: Affected Environment." The analysis of the impacts of each alternative is presented in "Chapter 4: Environmental Consequences."

Vegetation, Unique Vegetation Communities, and Special-status Plant Species

The Seashore contains a variety of vegetation communities such as the Northern Beach Grass Dune and Maritime Deciduous Scrub Forest in upland areas, the maritime holly forest, and tidal marshes along the backbay shoreline.

Based on a review of the U. S. Fish and Wildlife (USFWS) Information, Planning, and Conservation System and the NYS-DEC Division of Fish, Wildlife, and Marine Resources, the following state- and federally listed plant species are known to occur regionally in the Long Island area of New York: the state endangered and federally threatened seabeach amaranth (*Amaranthus pumilus*); the state endangered spring lady's tresses (*Spiranthes vernalis*); the state threatened marsh straw sedge (*Carex hormathodes*) and swamp sunflower (*Helianthus angustifolius*); the state-listed rare seabeach knotweed (*Polygonum glaucum*); and the state endangered dark-green sedge (*Carex venusta*), rough rush-grass (*Sporobolus clandestinus*), golden dock (*Rumex fueginus*), narrow-leaf sea-bite (*Suaeda linearis*), and slender marsh-pink (*Sabatia campanulata*).

No taking of these species is anticipated to take place as a result of Seashore actions, and the Seashore's current fencing of special-status species guards against take caused by deer browse. Should any need for take of any federally listed special-status species be identified due to

implementation of the proposed alternatives, the Seashore would consult with the USFWS. Otherwise, the proposed alternatives would include efforts to protect native vegetation and special-status plant species from deer browse and support forest regeneration. Therefore, the impact topic of vegetation, unique vegetation communities, and special-status plant species was retained for further analysis.

Wetlands

Executive Order 11990, "Protection of Wetlands" and NPS Director's Order 77-1: *Wetland Protection* (NPS 2012a) requires an examination of impacts on wetlands. Over 800 acres of tidal marsh wetlands and 112 acres of freshwater dunal wetlands occur on Fire Island according Klopfer et al. (2002). Tidal systems include low marsh and high marsh found primarily on the bayside of the Seashore and at the southern end of the William Floyd Estate. Freshwater systems include highbush blueberry swamp, northern interdunal cranberry swale wetlands, reed marsh dominated by the invasive species *Phragmites australis*, and red-maple/blackgum swamp. White-tailed deer use these existing wetlands as a foraging source, and may cause some impacts due to deer browse and trampling of individual plants. In addition, the Seashore may consider the use of fences for browse control, some of which may bisect wetlands when installed. Therefore, the impact topic of wetlands was retained for further analysis.

White-tailed Deer Population

Management actions proposed in this plan/EIS have the potential to affect the abundance, distribution, behavior, and in some cases physiology of deer at the Seashore. Management actions could cause deer to avoid certain areas in the Seashore. This could result in higher competition for resources in other areas and increased movement across the Seashore boundary. Therefore, the impact topic of white-tailed deer population was retained for further analysis.

Other Wildlife and Wildlife Habitat

Other wildlife, including mammals and birds, are affected by the existing deer population, primarily as a result of the alteration of available suitable habitat or direct competition for limited food resources. Impacts of heavy browsing on vegetation-dependent wildlife communities are apparent and include changes in species composition, abundance, and distribution. Reductions in white-tailed deer population densities would reduce competition for food and deer browsing. This could result in changes to feeding and nesting patterns for other wildlife within the Seashore. Noise associated with management actions could cause temporary changes in daily movement patterns and selection of feeding or breeding/nesting sites for other wildlife. Therefore, the impact topic of other wildlife and wildlife habitat was retained for further analysis.

Wilderness

A wilderness area is defined, in part, as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain… An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation" (PL 88-577). Pursuant to Public Law 95-585, the Fire Island Wilderness was established in the Seashore and is the only federally designated wilderness area in New York State. Deer management efforts within wilderness have the potential to affect the wilderness character. Therefore, the impact topic of wilderness was retained for further analysis.

Cultural Landscapes

As described in Director's Order 28, a cultural landscape is "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values" (NPS 2002a). A Cultural Landscape Inventory has been completed at the William Floyd Estate, and evidence of deer browse on vegetation has been documented by Seashore staff. The proposed alternatives would be designed, in part, to reduce the impact of deer browse on the cultural landscape at the William Floyd Estate. Therefore, the impact topic of cultural landscapes was retained for further analysis.

Visitor Use and Experience/Recreation

The implementation of some of the proposed actions could have an impact on visitor use and experience. Some visitors to the Seashore view deer sightings as an integral part of their visit. Deer management actions may decrease the potential for visitors to observe deer within the Seashore, reducing satisfaction for some visitors. Conversely, there are visitors who come to the Seashore to enjoy other resources, such as to observe songbirds. Increased deer browse has the potential to impact these other resources and impact the satisfaction of these visitors.

Management activities such as reproductive treatments, direct reduction, or translocation may require visitors to be prohibited from certain areas of the Seashore. Additionally, some visitors may be opposed to the proposed management actions. As the alternatives are implemented, some visitor experiences may change as the deer population is reduced. Therefore, the impact topic of visitor use and experience was retained for further analysis.

Fire Island Communities and Adjacent Landowners

In addition to federally owned land, the Seashore encompasses 17 private communities and towns, Smith Point County Park, and three municipal beaches (Bellport Beach, Leja Beach/Davis Park, and Atlantique Beach). Robert Moses State Park is adjacent to the western end of the Seashore. Many Fire Island community residents enjoy the presence of deer and actively feed them to attract them to their property. However, community residents also have concerns related to browse on native vegetation (i.e., private landscaping), access to trash, disease transmission (i.e., Lyme disease), and habituation of deer. Because the deer population on Fire Island migrates between the Seashore and Fire Island communities, deer management efforts proposed in the alternatives would likely affect the presence of deer on adjacent properties. Therefore, the impact topic of Fire Island communities and adjacent landowners was retained for further analysis.

Public Health and Safety

Any deer management activities would be conducted in a manner that would minimize risk to the safety of members of the public and Seashore employees; however, there are some inherent safety risks. In addition, tick-borne diseases pose health risks to Seashore visitors or area residents, as well as the larger Long Island area. Blacklegged ticks (*Ixodes scapularis*) carry Lyme disease, and the Department of Health and Human Services Center for Disease Control and Prevention has stated that abundant deer and rodent hosts are necessary to maintain the spirochete *Borrelia burgdorferi*, the causative agent of Lyme disease. Though deer cannot transmit the disease to humans or ticks, a high deer population—in addition to the presence of rodents and small mammals—may support an increased tick population compared to a smaller deer population (CDC 2012; Stafford 2007).Therefore, the impact topic of public health and safety was retained for further analysis.

Seashore Operations

Seashore staff and funding are used to promote the visitor experience and protect and monitor natural and cultural resources. Past and current monitoring of the Seashore's vegetation and deer population have been driven by available staff and funding. Proposals made in this plan/EIS could result in changes to staffing and funding. Therefore, the impact topic of Seashore operations was retained for further analysis.

ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

The following impact topics were initially considered but were then dismissed from further analysis for the reasons outlined below.

Special-status Wildlife Species

Based on information provided by a search of the U. S. Fish and Wildlife's Information, Planning, and Conservation System and the NYS-DEC Division of Fish, Wildlife, and Marine Resources on March 5, 2012, a variety of state- and federally listed bird species occur within the Seashore. Identified species include the state species of concern seaside sparrow (*Ammodramus maritimus*); the state threatened northern harrier (*Circus cyaneus*), common tern (*Sterna hirundo*), and least tern (*Sternula antillarum*); the state protected birds little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), laughing gull (*Leucophaeus atricilla*), and glossy ibis (P*legadis falinellus*); the state and federally endangered roseate tern (*Sterna dougallii*); and the state endangered and federally threatened piping plover (*Charadrius melodus*). In addition, the state endangered Eastern mud turtle (*Kinosternon subrubrum*) is known to occur within the Seashore.

Of the bird species listed above, most all favor beaches, foredunes, and marshes as habitat for either loafing, feeding, or nesting. The northern harrier will use marshes but can also be found utilizing open fields (Audubon 2014). The Eastern mud turtle is also a water dependent species, utilizing brackish marshes, ponds, and wet ditches (NYS-DEC 2014). All of the proposed actions are directed at improving vegetative habitats across the Seashore in the long term by controlling heavy deer browse. None of the actions would be directed at the habitats preferred by these special-status species. Therefore, the actions proposed in this document are unlikely to result in long-term impacts on state- and federally listed wildlife species. Localized, temporary impacts could occur from implementing direct reduction or fertility control to reduce deer numbers due to the presence of humans, though the long-term impact would be less than minor. Specifically, although only deer would be targeted by direct reduction efforts, other animals such as state- or federally listed birds could be temporarily disturbed by the sound of firearms or the presence of humans causing a temporary flight response. Because fertility control and direct reduction would occur during fall and winter months, this action would not impact any nesting birds. Based on the information above, the impact topic of special-status wildlife species was considered but dismissed from further analysis. The Seashore will provide the U.S. Fish and Wildlife Service with a copy of the plan/EIS and will continue to consult with the agency as the project moves forward, as appropriate.

Prime and Unique Farmlands

Prime farmland is one of several designations made by the U.S. Department of Agriculture to identify important farmlands in the United States. It is important because it contributes to the nation's short- and long-range needs for food and fiber. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing

season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, few to no rocks, and permeable soils (designated as prime farmland soils). Prime farmland soils within the project area occur at the William Floyd Estate and are characterized by Riverhead sandy loam and Sudbury sandy loam soil types (NRCS 2013). These soils are currently occupied by forests, agricultural fields, and maintained meadows. Although such soils are present within the project area, "unnecessary and irreversible conversion of farmland to non-agricultural uses" (Farmland Protection Policy Act of 1980) is not expected under the proposed alternatives. Therefore, the topic of prime and unique farmlands was considered but dismissed from further analysis.

Water Resources

NPS *Management Policies 2006* (NPS 2006a) states that the National Park Service will "take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations." The Seashore is located off the southern coast of Long Island and is bordered by the Great South Bay to the north, the Atlantic Ocean to the south, Fire Island Inlet to the west, and Moriches Inlet to the east. However, the proposed action would not involve activities with the potential to affect these waters or water quality over the long term. Ground and surface water resources at the Seashore comprise a small portion of the ecosystem and are most sensitive to the ever-changing complexes shaped by wave and wind action, storms, and human actions. Implementation of the deer and vegetation management actions would not noticeably affect water resources. Therefore, the impact topic of water resources was considered but dismissed from further analysis.

Floodplains and Flood Zones

Executive Order 11988, "Floodplain Management" and NPS Director's Order 77-2: *Floodplain Management* (NPS 2003) require an examination of impacts on floodplains and flood zones and the potential risk involved in placing facilities within floodplains and flood zones. Changes in the white-tailed deer population would have no impact on the ability of the floodplain or flood zone to convey or store flood waters. Therefore, the impact topic of floodplains and flood zones was considered but dismissed from further analysis.

Historic Structures

Per the NPS *Management Policies 2006*, actions on historic and prehistoric structures are to be based on "sound preservation practice to enable the long-term preservation of a structure's historic features, materials, and quality." A historic structure is defined by the National Park Service in Director's Order 28: *Cultural Resource Management* (NPS 2002a) as "a constructed work, usually immovable by nature or design, consciously created to serve some human act." While historic structures and features exist within the Seashore, they would not be impacted by the proposed actions. Therefore, the impact topic of historic structures was considered but dismissed from further analysis.

Archeological Resources

The National Park Service defines an archeological resource as any material remains or physical evidence of past human life or activities that are of archeological interest, including the record of the effects of human activities on the environment. Known archeological resources have been studied and preserved at various curatorial and storage facilities at the Seashore. Although ground disturbing activities such as fencing installation have the potential to impact unknown archeological resources, the implementation of the proposed action would be unlikely to impact

known or unknown archeological resources. If previously undiscovered archeological resources are uncovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented, and an appropriate mitigation strategy would be developed in consultation with the State Historic Preservation Officer (SHPO). Therefore, the impact topic of archeological resources was considered but dismissed from further analysis.

Indian Trust Resources and Sacred Sites

Secretarial Order 3175 requires that any anticipated impacts on Indian Trust resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable obligation on the part of the U.S. to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal laws with respect to American Indians, Alaskan Natives, and Native Hawaiians. During scoping, the Unkechaug Indian Nation and the Shinnecock Indian Nation were notified via letter of the proposed action (see appendix A). There are no known Indian Trust resources or sacred sites at the Seashore, and the lands comprising the Seashore are not held in trust by the secretary of the interior for the benefit of Indians due to their status as Indians. Therefore, the impact topic of Indian Trust resources and sacred sites was dismissed from further analysis.

Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-income Populations" requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental impacts of their programs and policies on minorities and low-income populations and communities. No minority or low-income populations are located in or adjacent to the Seashore, including the William Floyd Estate. Therefore, since the proposed action is confined to federal land and the Fire Island communities, the proposed management objectives and potential actions would not affect low-income or minority populations and the impact topic of environmental justice was dismissed from further analysis.

RELATED LAWS, POLICIES, PLANS, AND CONSTRAINTS

GUIDING LAWS, REGULATIONS, AND POLICIES

National Park Service Organic Act

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of Interior and the National Park Service to manage units "to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC [United States Code] 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the National Park Service must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1a-1).

NPS *Management Policies 2006*

Several sections from the NPS *Management Policies 2006* (NPS 2006a) are relevant to vegetation, cultural landscapes, and deer management at the Seashore. If natural landscapes are disturbed by natural phenomena, park units are to let them recover naturally unless manipulation is needed to (1) mitigate for excessive disturbance caused by past human effects or (2) preserve cultural and historic resources as appropriate based on park planning documents (section 4.4.2.4).

Management of "biotic cultural resources," which include plant and animal communities associated with the significance of a cultural landscape, is covered in section 5.3.5.2.5. NPS *Management Policies 2006* direct parks to plan with both cultural and natural resource stewardship in mind in this case, and to have plans that are jointly acceptable to both divisions. The NPS resource stewardship strategy is to "anticipate and plan for the natural and human-induced processes of change. Before any major treatment of a cultural landscape is undertaken, there must be an understanding of the degree to which change contributes to or compromises the historic character of the landscape, and the way in which natural cycles influence the ecological processes within the landscape. Treatment and management of a cultural landscape will establish acceptable parameters for change and manage the biotic resources within those parameters."

Deer management is guided by other sections of NPS *Management Policies 2006*. Park units are to maintain as parts of the natural ecosystems of parks all native plants and animals. The National Park Service is to achieve this by "preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the Fire Island communities and ecosystems in which they occur." Furthermore, the National Park Service is to "adopt park resource preservation, development, and use management strategies that are intended to maintain the natural population fluctuations and processes that influence the dynamics of individual plant and animal populations, groups of plant and animal populations, and migratory animal populations in parks." Whenever the National Park Service identifies a possible need for reducing the size of a park plant or animal population, the decision will be based on scientifically valid resource information that has been obtained through consultation with technical experts, literature review, inventory, monitoring, or research (NPS 2006a).

Section 4.4.2 of NPS *Management Policies 2006* also states, "Whenever possible, natural processes will be relied upon to maintain native plant and animal species, and to influence natural fluctuations in populations of these species. The Service may intervene to manage individuals or populations of native species when at least one of the following conditions exists:

- because a population occurs in unnaturally high or low concentration as a result of human influences (such as loss of seasonal habitat, the extirpation of predators, the creation of highly productive habitat through agriculture or urban landscapes) and it is not possible to mitigate the effects of the human influences;
- to protect specific cultural resources of parks;
- to protect rare, threatened, or endangered species."

Section 4.4.2.1 of NPS *Management Policies 2006* allows for the management of native species to prevent them from interfering broadly with natural habitats, natural abundances, and natural distributions of native species and natural processes. Section 4.4.2.1 of NPS *Management Policies 2006* states, "Where visitor use or human activities cannot be modified or curtailed, the Service may directly reduce the animal population by using several animal population management techniques, either separately or together. These techniques include translocation, public hunting on lands outside the park or where legislatively authorized within a park, habitat management, predator

restoration, reproductive intervention, and destruction of animals by NPS personnel or their authorized agents. Where animal populations are reduced, destroyed animals may be left in natural areas of the park to decompose" (NPS 2006a). Additionally, the Secretary of the Interior has broad discretion in managing wildlife. Section 4.4.2.1 of the NPS *Management Policies 2006* also states that the destruction of animals may be carried out by NPS personnel or their authorized agents.

NPS policies also require that parks "assess the results of managing plant and animal populations by conducting follow-up monitoring or other studies to determine the impacts of the management methods on nontargeted and targeted components of the ecosystem" section 4.4.2. This strategy is described in this plan including specific thresholds for taking action.

Authority to Manage White-tailed Deer

The National Park Service has broad authority to manage wildlife and other natural resources within the boundaries of units of the National Park System. According to 16 USC 3, "[The Secretary of the Interior] may… provide in his discretion for the destruction of such animals and of such plant life as may be detrimental to the use of any of [the parks, monuments, and reservations under the jurisdiction of the National Park Service]."

In defining this discretion, the 10th Circuit Court of Appeals, in *New Mexico State Game Commission v. Udall* (410 F.2d 1197, 1201), noted that the National Park Service "need not wait until the damage through overbrowsing has taken its toll on park plant life … before taking preventative action" (10th Cir. 1969). This discretion has been reinforced over time. In *United States v. Moore*, (640 F. Supp. 164, 166) the court found that Congress had given the Secretary of the Interior great discretion in regulating and controlling wildlife within the national parks. This discretion is further defined by NPS management policy.

OTHER FEDERAL AGENCY LAWS, REGULATIONS, PLANS, POLICIES, AND ACTIONS

In addition to those listed above, the National Park Service is governed by other federal laws and regulations. Based on the scope of this plan/EIS, these include the following.

Code of Federal Regulations, Title 36 and Title 43

Title 36, Chapter 1 of the Code of Federal Regulations provides the regulations "for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the NPS." In 43 CFR 24, the U.S. Department of the Interior is provided with policy guidance for interagency cooperation in the preservation, management, and use of fish and wildlife resources.

RELATED STATE LAWS, REGULATIONS, AND POLICIES

The NYS-DEC is responsible for administration and enforcement of the state's Environmental Conservation Law which includes the authority to administer fish and wildlife laws, carry out sound fish and wildlife management practices, and conduct fish and wildlife research. In addition, the NYS-DEC is the agency entrusted with administration and oversight of deer population management in New York according to the specific policies, authorities, and responsibilities outlined in the New York State Environmental Conservation Law Article 11.

ECL 11-0303 directs NYS-DEC to develop and carry out programs that will promote natural propagation and maintenance of desirable species in ecological balance and lead to the observance of sound management practices. ECL 11-0903 and 11-0907 describe NYS-DEC's authority for establishing open seasons, manner of take and bag limits for hunting deer in Suffolk County, including Fire Island. As a result of these statutes, current deer hunting opportunities in Suffolk County exist in the form of an archery season from October 1 to December 31, and a special firearms season commencing weekdays only no earlier than the first full week in January through January 31st (typically 15–20 hunting days).

In addition to take of deer through regulated hunting, ECL 11-0515 authorizes NYS-DEC to issue a revocable license for the collection and possession of wildlife for scientific purposes. Similarly, ECL 11-0521 allows for issuance of a permit for the capture, harassing, or taking of wildlife that are a nuisance, destructive to public or private property or a threat to public health or welfare.

NYS-DEC's current priorities and the values and issues expressed by the public for deer management are encompassed in the *Management Plan for White-tailed Deer in New York State 2012–2016* (NYS-DEC 2011). While statewide in scope, the deer plan also highlights management options available to public and private land managers. The plan identifies a tiered system of harvest management that allows for varying degrees of management intensity across a gradient of landscape scales, whereby regulated hunting is recognized as the most cost effective and equitable mechanism to manage deer populations across a broad range of geographic scales, whereas specific deer damage permits may be used to address situations of deer-related damage at community and property scales. The plan also describes the experimental framework through which fertility control projects may be conducted on wild deer within New York.

The National Park Service will coordinate with the state during implementation of this plan to ensure that mutual management goals are achieved and all pertinent regulatory and permitting needs are met. For example, if hunting or trapping are authorized or if research programs involving the taking or possession of fish and wildlife are implemented, these activities would conducted in accordance with Federal and State laws as appropriate.

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