



Fire Island National Seashore

Draft White-tailed Deer Management Plan and Environmental Impact Statement



July 2014

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Fire Island National Seashore, New York
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Lead Agency: National Park Service (NPS), U.S. Department of the Interior

Cooperating Agencies: New York State Department of Environmental Conservation (NYS-DEC) and Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture

This *Draft White-tailed Deer Management Plan and Environmental Impact Statement* (plan/EIS) describes four alternatives for the management of white-tailed deer at Fire Island National Seashore (the Seashore), as well as the environment that would be affected by the alternatives and the environmental consequences of implementing these alternatives.

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 human infrastructure. Action is needed at this time to address impacts associated with changes in white-tailed deer abundance, distribution, and behavior across the Seashore. Heavy browsing by white-tailed deer has resulted in adverse impacts on native vegetation across Fire Island as well as on natural and cultural resources at the William Floyd Estate. The presence of abundant food sources (including naturally occurring vegetation, unsecured garbage, intentional feeding, gardens/ornamental landscaping) and shelter in the Fire Island communities have resulted in adverse interactions between deer and humans and the developed environment. Adverse interactions also occur due to the 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.

Alternative A (the no-action alternative) would continue to implement current management actions, policies, and monitoring efforts related to deer and their impacts. Current actions within the Seashore include limited public education and interpretation efforts, vegetation monitoring, and deer population and behavior surveys. All action alternatives (B, C, and D) would include an enhanced public education and outreach effort, fencing of the maritime holly forest within the Sunken Forest, securing the boundary fence at the William Floyd Estate, small-scale fencing to protect special-status species, increased vegetation monitoring, enhanced deer population and behavior monitoring, and close coordination with the New York State Department of Environmental Conservation. Under alternative B, additional deer browsing management actions would include fencing of the historic core at the William Floyd Estate and rotational fencing of selected forest areas at the William Floyd Estate lower acreage. The fencing would be implemented in conjunction with fertility control of white-tailed deer to gradually reduce and then maintain the deer population at an appropriate density to achieve the plan objectives. Deer observed approaching humans within the Fire Island communities would be relocated to the Fire Island Wilderness. Under alternative C (the environmentally preferable alternative), additional actions would be taken to directly reduce and maintain the deer population at an appropriate deer density to allow for vegetation regeneration. Deer population reduction and maintenance would be implemented through a combination of sharpshooting, capture and euthanasia of individual deer (where necessary), and public hunting (within the Fire Island Wilderness only). Deer observed approaching humans within the Fire Island communities would be captured and euthanized to reduce the risk of negative human-deer interactions and prevent other deer from learning this behavior through observation. Alternative D (the NPS preferred alternative) would include a

combination of actions from both alternatives B and C. The historic core at the William Floyd Estate would be fenced to exclude deer. The deer population on Fire Island and at the William Floyd Estate lower acreage would be reduced to an appropriate deer density to achieve the plan objectives through a combination of sharpshooting, capture and euthanasia of individual deer (where appropriate), and public hunting (within the Fire Island Wilderness only). Once reduced, the deer population could be maintained through fertility control or a continuation of actions used for direct reduction. Similar to alternative C, deer observed approaching humans within the Fire Island communities would be captured and euthanized.

Implementation of the preferred alternative would result in both beneficial and adverse impacts on vegetation, unique vegetation communities, and special-status plant species; wetlands; the white-tailed deer population; other wildlife and wildlife habitat; wilderness; cultural landscapes; visitor use and experience/recreation; Fire Island communities and adjacent landowners; public health and safety; and Seashore operations.

Note to Reviewers and Respondents:

The Draft plan/EIS is available for public and agency review and comment for 60 days, beginning when the U.S. Environmental Protection Agency Notice of Availability is published in the Federal Register. If you wish to comment on this plan/EIS, you may post them electronically at <http://parkplanning.nps.gov/FireIslandDeerManagementPlan> or you may mail comments to the name and address below. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we would be able to do so. After public review is completed, this plan/EIS will be revised in response to public comments. A final version of this plan/EIS will then be released, and a 30-day no-action period will follow. After the 30-day no-action period, the alternative or actions constituting the approved plan will be documented in a record of decision that will be signed by the Regional Director of the Northeast Region.

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Executive Summary



PURPOSE OF AND NEED FOR ACTION

PURPOSE

The purpose of this White-tailed Deer Management Plan and Environmental Impact Statement (plan/EIS) is to develop a deer management strategy that: supports protection, preservation, 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 also promotes public understanding of the complex relationship between deer and Seashore resources, tick-borne diseases, people, and human infrastructure.

NEED

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. Seashore staff have been working to understand and address issues linked to the deer population on Fire Island for 30 years. Concerns 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. More recently, Seashore staff have turned their attention to the threat posed by deer to native vegetation in other natural zones of the Seashore and the cultural landscape of the William Floyd Estate.

Information collected as part of 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

- 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. 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 groundnesting birds and small mammals using these areas for food and shelter.

As a consequence of the habituation of deer to humans on Fire Island, deer no longer flee humans. Many are also conditioned to actively seek food provided by some residents of Fire Island

communities or visitors to Fire Island. These artificial food sources include garbage, vegetable gardens, ornamental plantings, and corn (used as bait in 4-Poster Tickicide devices). This food conditioning and habituation to the presence of humans has led to behavioral changes in deer that add to various existing concerns for human health and safety, including direct physical injury to Fire Island community residents and visitors, sanitation issues regarding deer scattering garbage, and the perceived role of deer in the incidence of Lyme disease. Other concerns include damage to ornamental plantings and vegetable gardens, interactions with pets, deer feeding on garbage, and injury to deer from fences.

Additionally, current levels of browsing by deer at the William Floyd Estate are resulting in the degradation of elements of the cultural landscape. 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.

OBJECTIVES

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 and vegetation 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 plant 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, and 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 in perpetuity by creating conditions for 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

Sunken Forest

The Sunken Forest is a globally rare ecosystem with herbaceous vegetation and forest regeneration that have been impacted by heavy browse pressure from deer. Five studies since 1967 indicate changes in the vegetation structure and composition of the Sunken Forest as the deer population expanded in the 1970s and 1980s, giving rise to the concern that forest regeneration to replace the aging canopy is limited and that the understory constituents are changing. One of the earliest studies (Art 1976) captures the vegetation composition and structure of the Sunken Forest in 1967 prior to the deer population irruption on Fire Island. Using Art's 1976 report as a guide, 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 Communities

A desired condition of the Seashore is to reduce undesirable human-deer interactions within the Fire Island communities. Based on staff observations, deer observed approaching humans are likely responsible for the majority of the interactions in the Fire Island communities. To achieve this desired condition, the Seashore would need to focus on two goals: (1) changing the behavior of the people who intentionally and unintentionally feed deer, because they perpetuate the food conditioning of the deer and create future generations of deer that approach humans; and (2) addressing the individual deer that are highly food conditioned and already approach humans.

William Floyd Estate

The 613-acre William Floyd Estate 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.

DESCRIPTION OF THE PROJECT AREA

PROJECT LOCATION

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. The Seashore encompasses 19,579 acres of barrier island natural systems including marine waters, uplands, 1,381 acres of wilderness, and the historic William Floyd Estate. The William Floyd Estate is located on the southern coast of Long Island, in the village of Mastic Beach. 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 and averages less than 1 mile in width, and the approximately 613-acre William Floyd Estate in Mastic Beach, Long Island (NPS 2012b).

Three breaches formed on Fire Island during Hurricane Sandy, and one still remains. The open breach is located in an area known as Old Inlet toward the eastern portion of the Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness). This open breach migrated rapidly westward over the winter storm season of 2012–2013 following Hurricane Sandy, but since then it has stayed relatively stable.

On Fire Island, 17 private residential communities and the Smith Point County Park are within the Seashore’s administrative boundary. The eastern boundary of Robert Moses State Park is the west boundary of the Seashore.

WHITE-TAILED DEER POPULATION

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 the Fire Island to the western side as deer were attracted to artificial food sources (e.g., gardens, garbage, lawns) in Fire Island communities. By the 1970s and 1980s the deer population had become established in 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 population and impacts on Seashore resources. Over the decades, deer abundance has been estimated using different techniques. 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 (NPS 2013d). The latest (2012) deer density estimates (plus or minus the noted standard error) for the Seashore are provided in table ES-1 below.

TABLE ES-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 ± 10	60 ± 8
Lighthouse Tract	10 ± 5	2 ± 1
Kismet-Lonelyville	227 ± 42	80 ± 15
Ocean Beach – Ocean Bay Park	126 ± 14	37 ± 4
Sailors Haven-Sunken Forest	112 ± 24	27 ± 6
Fire Island Pines	149 ± 29	26 ± 5
Davis Park	137 ± 25	10 ± 2
Fire Island Wilderness	54 ± 6	91 ± 11
William Floyd Estate	106 ± 17	96 ± 16

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 when deer traveled 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). Deer on the western side of the Fire Island Pines/Talisman had higher body weights from nutritional benefits within the Fire Island communities (from artificial food sources such as ornamental plantings, 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 (O'Connell and Sayre 1989; Underwood 2005). While 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.

ALTERNATIVES

The alternatives under consideration include a no-action alternative and three action alternatives. Under alternative A: no action, existing deer management and monitoring efforts throughout the Seashore would continue. These actions include continued public education/interpretation efforts, vegetation monitoring, and deer population and behavior surveys. Each of the action alternatives (alternatives B, C, and D) includes the monitoring and education actions proposed under alternative A. In addition, all action alternatives would enhance those education efforts and propose to work collaboratively with the Fire Island communities, New York State Department of Environmental Conservation, New York State Parks, Suffolk County Parks, and local environmental groups on wildlife issues within the Fire Island communities. Each action alternative would manage undesirable human-deer interactions, protect native plant communities and cultural plantings, promote forest regeneration, and gradually reduce the deer population in the Seashore.

ELEMENTS COMMON TO ALL ALTERNATIVES

The following actions would continue under alternative A and would also be common to all action alternatives:

- human-deer interaction management
 - education/interpretation
 - deer behavior monitoring
 - incident reporting and response
- vegetation monitoring
- deer population monitoring

ALTERNATIVE A

Under the no-action alternative, the Seashore would continue to implement current management actions, policies, and monitoring efforts related to deer and their effects. Current actions within the Seashore include limited public education/interpretation efforts, vegetation monitoring, early detection and rapid response to invasive plant species, and deer population surveys.

ELEMENTS COMMON TO ACTION ALTERNATIVES

In addition to continuing the elements described under alternative A (public education/interpretation efforts, incident reporting and response, deer and vegetation monitoring), the actions below would be common to all action alternatives:

- enhanced public education and outreach effort
- fencing of the Sunken Forest
- securing the boundary fence at the William Floyd Estate
- tri-annual enhanced vegetation monitoring
- annual enhanced deer population monitoring
- minimum requirements analysis (for actions in the Fire Island Wilderness)
- coordination with the New York State Department of Environmental Conservation

ALTERNATIVE B

Under alternative B, deer observed approaching humans within the Fire Island communities would be translocated to the Fire Island Wilderness. Deer browsing management actions would include exclosure fencing in the Sunken Forest (approximately 44 acres of maritime holly forest), fencing of an area encompassing the historic core at the William Floyd Estate (approximately 80 acres), rotational fencing of selected forest areas at the William Floyd Estate lower acreage (approximately 66 acres at one time), and small-scale fencing to protect special-status species. The fencing would be implemented in conjunction with fertility control of white-tailed deer to gradually reduce and then maintain the deer population at an appropriate density to achieve the plan objectives (estimated at 20 deer per square mile across Fire Island and 20 deer per square mile at the William Floyd Estate). Fertility control would be implemented using a chemical reproductive control agent (when an acceptable agent, i.e., an agent meeting criteria specified in the plan/EIS, becomes available). For the purpose of including a diverse array of management alternatives, the plan/EIS assumes an acceptable chemical reproductive control agent that meets all of the established criteria may be available within 10 years. Once adequate levels of tree seedling recruitment have been reached, it may be possible to eliminate or reduce fencing. This would be assessed using adaptive management.

ALTERNATIVE C

Under alternative C, deer browse would be managed through exclosure fencing in the Sunken Forest (approximately 44 acres of maritime holly forest) and small-scale fencing to protect special-status species and key plants within the William Floyd Estate historic core. Actions would be taken to directly reduce and maintain the deer population at an appropriate deer density to allow for regeneration (estimated at 20 deer per square mile across Fire Island and 20 deer per square mile at the William Floyd Estate). The deer population would be reduced and maintained through a combination of sharpshooting, capture and euthanasia of individual deer (where necessary), and public hunting (within the Fire Island Wilderness only). Deer observed approaching humans within the Fire Island communities would be captured and euthanized to reduce the risk of negative human-deer interactions and prevent other deer from learning this behavior through observation. Alternative C has been identified as the environmentally preferable alternative.

ALTERNATIVE D

Deer browsing management actions would include enclosure fencing in the Sunken Forest (approximately 44 acres of maritime holly forest), fencing of an area encompassing the historic core at the William Floyd Estate (approximately 80 acres), and small-scale fencing to protect special-status species. The deer population would be reduced to an appropriate deer density to achieve the plan objectives (estimated at 20 deer per square mile across Fire Island and 20 deer per square mile at the William Floyd Estate) through a combination of sharpshooting, capture and euthanasia of individual deer (where appropriate), and public hunting (within the Fire Island Wilderness only). Once reduced, the deer population could be maintained through fertility control. Fertility control would be implemented using a chemical reproductive control agent (when an acceptable agent becomes available). Until an acceptable and effective reproductive control agent becomes available, the deer population would be maintained using the same methods used for direct reduction as described above. Deer observed approaching humans within the Fire Island communities would be captured and euthanized to reduce the risk of negative human-deer interactions and prevent other deer from learning this behavior through observation. Alternative D has been identified as the NPS preferred alternative.

ENVIRONMENTAL CONSEQUENCES

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, and table ES-2 provides a summary of the 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. Deer population reduction as a result of deer management actions would promote vegetation richness and plant abundance because the impact of deer browse would be reduced.

The following state- and federally listed plant species occur within the Seashore: 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*).

WETLANDS

Over 800 acres of tidal marsh wetlands and 112 acres of freshwater dunal wetlands occur on Fire Island according to Klopfer et al. (2002). Tidal systems include low marsh and high marsh found primarily on the bay side 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.

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.

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 well documented 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.

WILDERNESS

A wilderness area is defined, in part, as “an area where the earth and its community of life are untrammelled 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.

CULTURAL LANDSCAPES

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.

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 or 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.

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.

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 may support an increased tick population compared to lower deer densities (CDC 2012; Stafford 2007).

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.

CONSULTATION AND COORDINATION

INTERNAL SCOPING

Internal scoping meetings were held to provide opportunities for the NPS team to initiate the NEPA planning process and discuss the management of white-tailed deer at the Seashore and to develop the alternatives that are considered in this plan/EIS. The internal scoping process continued throughout the development of the plan/EIS through regular conference calls.

PUBLIC SCOPING AND OUTREACH

The Seashore published the Notice of Intent to prepare an EIS in the *Federal Register* on June 17, 2011. The Seashore also issued a press release on June 17, 2011. These documents represented the beginning of the public scoping and outreach process. In addition, the Seashore published three newsletters (summer 2011, fall 2012, and fall 2013) that were provided to known stakeholders and posted on the NPS Planning, Environment, and Public Comment website (<http://parkplanning.nps.gov/FireIslandDeerManagementPlan>).

COOPERATING AGENCIES

The National Park Service invited the New York State Department of Environmental Conservation and the U.S. Department of Agriculture Animal and Plant Health Inspection Services to be cooperating agencies for the plan/EIS in letters dated November 29, 2011. Each agency accepted this offer in memoranda of understanding finalized on July 3, 2012. The cooperating agencies participated in the monthly interdisciplinary team status calls and the development of alternatives, provided information in their areas of technical expertise, and had the opportunity to comment on the internal review draft plan/EIS as it was prepared.

AGENCY AND TRIBAL CONSULTATION

In addition to establishing which agencies would serve as cooperating agencies, as described above, other agencies were consulted to aid in identification of potential issues to be addressed in the plan/EIS. The following agencies were consulted during the planning process:

- Federal Agencies
 - U.S. Fish and Wildlife Service for compliance with section 7 of the Endangered Species Act
 - New York State Historic Preservation Officer (SHPO) for compliance with section 106 of the National Historic Preservation Act
- American Indian Tribes for compliance with section 106 of the National Historic Preservation Act
 - Unkechaug Indian Nation
 - Shinnecock Indian Nation
- State and Local Agencies
 - New York State Department of Environmental Conservation, a cooperating agency
 - NYS-DEC Division of Fish, Wildlife and Marine Resources
 - New York State Department of State (Coastal Management Program) for compliance with the Coastal Zone Management Act

TABLE ES-2. SUMMARY OF SIGNIFICANCE

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Vegetation, Unique Vegetation Communities, and Special-status Plant Species	<p>The adverse impacts on vegetation/unique vegetative communities under alternative A would be significant because no comprehensive plan would be enacted to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. Natural processes left to proceed without human intervention would allow current adverse impacts to continue whereas the enabling legislation for the Seashore calls for conservation and preservation of natural features, specifically including the unique communities within the Sunken Forest.</p>	<p>Ultimately, the beneficial impacts on vegetation, unique vegetative communities, and special-status plant species under alternative B are expected to be significant because the Seashore would implement a comprehensive plan to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. The NPS intervention in current natural processes would allow Seashore managers to conserve and preserve the natural features, specifically including the unique communities within the Sunken Forest, as called for the Seashore’s enabling legislation. Actions taken to conserve listed species would be incorporated into the comprehensive deer management plan. Beneficial impacts are also considered significant because when considering cumulative impacts, deer browse likely would be the primary driver of vegetation composition throughout the Seashore if left unmanaged. The adverse impacts on vegetation could approach significant outside of fenced areas depending upon how long of a delay there is before the deer population density is reduced. Although a comprehensive plan would be enacted to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems, immediate vegetation protection measures would be limited to exclosures, allowing a heightened risk of local species extirpation and altered species abundance.</p>	<p>Overall, the beneficial impacts on vegetation, unique vegetation communities, and special-status plant species under alternative C are expected to be significant because the Seashore would implement a comprehensive plan to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. The NPS intervention in the current natural processes would allow Seashore managers to conserve and preserve the natural features, specifically including the unique communities within the Sunken Forest, as called for the Seashore’s enabling legislation. Actions taken to conserve listed species would be incorporated into the comprehensive deer management plan. Beneficial impacts are also considered significant in the context of cumulative impacts because deer browse likely would be the primary driver of vegetation composition throughout the Seashore if left unmanaged. Adverse impacts would not be significant because of their temporary, small-scale nature.</p>	<p>Overall, the beneficial impacts on vegetation, unique vegetation communities, and special-status plant species under alternative D are expected to be significant because the Seashore would implement a comprehensive plan to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. The NPS intervention in the current natural processes would allow Seashore managers to conserve and preserve the natural features, specifically including the unique communities within the Sunken Forest, as called for the Seashore’s enabling legislation. Actions taken to conserve listed species would be incorporated into the comprehensive deer management plan. Beneficial impacts are also considered significant in the context of cumulative impacts because deer browse likely would be the primary driver of vegetation composition throughout the Seashore if left unmanaged. Adverse impacts would not be significant because of their temporary, small-scale nature.</p>

TABLE ES-2. SUMMARY OF SIGNIFICANCE (CONT'D)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Wetlands	Under alternative A, no actions would occur related to deer population management at the Seashore that would require encroachments and/or impacts on wetlands and their functions.	The adverse impacts of alternative B on wetlands are not expected to be significant because there would be no loss of wetland functions, wetlands would be avoided to the extent possible, and all minor impacts would be consistent with policies and regulations for the protection of wetlands.	The adverse impacts of alternative C on wetlands are not expected to be significant because there would be no loss of wetland functions, wetlands would be avoided to the extent possible, and all minor impacts would be consistent with policies and regulations for the protection of wetlands.	The adverse impacts of alternative D on wetlands are not expected to be significant because there would be no loss of wetland functions, wetlands would be avoided to the extent possible, and all minor impacts would be consistent with policies and regulations for the protection of wetlands.
White-Tailed Deer	The above adverse impacts on the white-tailed deer population under alternative A would not be significant because the native deer population and related natural processes would be left to proceed without human intervention. The deer population would continue to be one of many natural features conserved and preserved by Seashore managers per the Seashore's enabling legislation.	Adverse impacts on the white-tailed deer population under alternative B are not significant because management actions, although some alteration in natural behavior will occur, human intervention would be part of a comprehensive plan to otherwise preserve and restore natural dynamics of the native ecosystem. Further, the NPS intervention in the current population dynamics would allow Seashore managers to conserve and preserve natural features as called for the Seashore's enabling legislation. Beneficial impacts would not be significant because while a lower population would provide a more natural dynamic, the deer population has been thriving in both natural and developed habitats without human intervention to this point.	Adverse impacts on the white-tailed deer population under alternative C are not significant because, although the population would see a rapid decrease, human intervention would be part of a comprehensive plan to otherwise preserve and restore natural dynamics of the native ecosystem. Further, the NPS intervention in the current population dynamics would allow Seashore managers to conserve and preserve natural features as called for in the Seashore's enabling legislation. Beneficial impacts would not be significant because while a lower population would provide a more natural dynamic, the deer population has been thriving in both natural and developed habitats without human intervention to this point.	Impacts on the white-tailed deer population under alternative D are not significant because, although the population would see a rapid decrease, human intervention would be part of a comprehensive plan to otherwise preserve and restore natural dynamics of the native ecosystem. Further, the NPS intervention in the current population dynamics would allow Seashore managers to conserve and preserve natural features as called for the Seashore's enabling legislation. Beneficial impacts would not be significant because while a lower population would provide a more natural dynamic, the deer population has been thriving in both natural and developed habitats without human intervention to this point.

TABLE ES-2. SUMMARY OF SIGNIFICANCE (CONT'D)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
<p>Other Wildlife and Wildlife Habitat</p>	<p>The adverse impacts on other wildlife and wildlife habitat under alternative A would be significant because no comprehensive plan would be enacted to preserve the natural abundances, diversities, dynamics, and distributions of native animal populations, communities, and ecosystems. Natural processes left to proceed without human intervention would allow current adverse impacts to continue, whereas the enabling legislation for the Seashore calls for conservation and preservation of natural features. Efforts to maintain quality habitat for migratory birds along the Atlantic flyway would take place outside of a comprehensive deer management plan.</p>	<p>The adverse impacts associated with fence construction would not be significant because they would be limited in scale and would generally result only in temporary disturbance. Adverse impacts associated with the relatively long time period for habitat recover have a risk of reaching significant levels if the delay causes substantial shifts in natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems; however, ultimately, the beneficial impacts on other wildlife and wildlife habitat under alternative B are expected to be significant because the Seashore would implement a comprehensive plan to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. The NPS intervention in the current natural processes would allow Seashore managers to conserve and preserve the natural features as called for the Seashore’s enabling legislation. Actions taken to conserve habitat incorporated into the comprehensive deer management plan would be especially important for migratory birds using the Atlantic flyway.</p>	<p>Adverse impacts would not be significant because they would be limited in scale and would generally result only in temporary disturbance. Beneficial impacts on other wildlife and wildlife habitat under alternative C are expected to be significant because the Seashore would implement a comprehensive plan to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. The NPS intervention in the current natural processes would allow Seashore managers to conserve and preserve the natural features as called for the Seashore’s enabling legislation. Actions taken to conserve habitat incorporated into the comprehensive deer management plan would be especially important for migratory birds using the Atlantic flyway.</p>	<p>Adverse impacts would not be significant because they would be limited in scale and would generally result only in temporary disturbance. Beneficial impacts on other wildlife and wildlife habitat under alternative D are expected to be significant because the Seashore would implement a comprehensive plan to preserve the natural abundances, diversities, dynamics, and distributions of native plant populations, communities, and ecosystems. The NPS intervention in the current natural processes would allow Seashore managers to conserve and preserve the natural features as called for the Seashore’s enabling legislation. Actions taken to conserve habitat incorporated into the comprehensive deer management plan would be especially important for migratory birds using the Atlantic flyway.</p>

TABLE ES-2. SUMMARY OF SIGNIFICANCE (CONT'D)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Wilderness	<p>The adverse impact on wilderness has the potential to approach the level of significance if deer browse pressures increased to a point where the natural quality of wilderness character is diminished; however, the existing impacts on the Fire Island Wilderness are not significant. The National Park Service would continue to manage wilderness areas for the use and enjoyment of the American people. Ongoing management actions may temporarily diminish wilderness character, but these actions would be implemented in order to manage and protect wilderness character in the long term and would be subject to the Minimum Requirement Decision Guide. Management includes the protection of these areas and the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness.</p>	<p>The beneficial impact on wilderness would not be significant because the qualities of wilderness character would be preserved in the long term. The National Park Service would manage wilderness areas for the use and enjoyment of the American people. Management would include the protection of these areas and the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness. The adverse impact on wilderness would be significant because the use of fertility control would be an active management strategy that would impose human control over natural deer biology, leave evidence of human intervention (i.e., marked deer), and would interfere intermittently with the opportunity for solitude. Such impacts must be evaluated and documented as described in the minimum requirements decision guide.</p>	<p>Neither beneficial nor adverse impacts on wilderness would not be significant because hunting would provide hunters with an opportunity for unconfined recreation while the qualities of wilderness character would be preserved in the long term; otherwise, no noticeable change in the qualities of wilderness character is expected. The National Park Service would manage wilderness areas for the use and enjoyment of the American people. Management would include the protection of these areas and the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness.</p>	<p>The beneficial impact on wilderness would not be significant because the qualities of wilderness character would be preserved in the long term. The National Park Service would manage wilderness areas for the use and enjoyment of the American people. Management would include the protection of these areas and the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness. The adverse impact on wilderness would be significant if fertility control is used because the use of fertility control would be an active management strategy that would impose human control over natural deer biology, leave evidence of human intervention (i.e., marked deer), and would interfere intermittently with the opportunity for solitude. Such impacts must be evaluated and documented as described in the minimum requirements decision guide.</p>

TABLE ES-2. SUMMARY OF SIGNIFICANCE (CONT'D)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Cultural Landscapes (William Floyd Estate)	Alternative A would have an adverse significant impact on the cultural landscape of the William Floyd Estate because deer browse of vegetation would hinder the ability of the Seashore to preserve a landscape indicative of the 240 years during which the Floyd family managed the William Floyd Estate.	The beneficial impacts of alternative B would be significant because reduction of deer browse of vegetation (primarily through exclusionary fencing) would improve the ability of the Seashore to preserve a landscape indicative of the 240 years during which the Floyd family managed the William Floyd Estate. Adverse impacts would not be significant because they would not prevent such preservation.	The beneficial impacts of alternative C likely would be significant because reduction of deer browse of vegetation in conjunction with some small-scale fencing would noticeably improve the ability of the Seashore to preserve a landscape indicative of the 240 years during which the Floyd family managed the William Floyd Estate. Adverse impacts would not be significant because they would not prevent such preservation.	The impacts of alternative D would be significant because reduction of deer browse of vegetation would improve the ability of the Seashore to preserve a landscape indicative of the 240 years during which the Floyd family managed the William Floyd Estate. Adverse impacts would not be significant because they would not prevent such preservation.
Visitor Use and Experience/ Recreation	Neither adverse nor beneficial impacts on visitor use and experience/recreation would not be significant because the Seashore would continue to offer relatively unspoiled and undeveloped beaches, dunes, and other natural features where visitors can interact with wildlife and learn about the William Floyd Estate.	Neither adverse nor beneficial impacts on visitor use and experience/recreation would not be significant because the Seashore would continue to offer relatively unspoiled and undeveloped beaches, dunes, and other natural features where visitors can interact with wildlife and learn about the William Floyd Estate.	Neither adverse nor beneficial impacts on visitor use and experience/recreation would not be significant because the Seashore would continue to offer relatively unspoiled and undeveloped beaches, dunes, and other natural features where visitors can interact with wildlife and learn about the William Floyd Estate.	Neither adverse nor beneficial impacts on visitor use and experience/recreation would not be significant because the Seashore would continue to offer relatively unspoiled and undeveloped beaches, dunes, and other natural features where visitors can interact with wildlife and learn about the William Floyd Estate.
Fire Island Communities and Adjacent Landowners	Neither adverse nor beneficial impacts on Fire Island communities and adjacent landowners would not be significant because deer would continue to move between the matrix of public and private lands where residents have mixed feelings about deer, but most residents would continue to be satisfied to some extent with the general quality of life on Fire Island.	Neither adverse nor beneficial impacts are not expected to be significant because deer would continue to move between the matrix of public and private lands where residents have mixed feelings about deer, but most residents would continue to be satisfied with the general quality of life on Fire Island.	Neither adverse nor beneficial impacts are not expected to be significant because deer would continue to move between the matrix of public and private lands where residents have mixed feelings about deer, but most residents would continue to be satisfied with the general quality of life on Fire Island.	Neither adverse nor beneficial impacts are not expected to be significant because deer would continue to move between the matrix of public and private lands where residents have mixed feelings about deer, but most residents would continue to be satisfied with the general quality of life on Fire Island.

TABLE ES-2. SUMMARY OF SIGNIFICANCE (CONT'D)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Public Health and Safety	Adverse impacts would not be significant because the Seashore would continue to provide a safe and healthful environment for visitors to and employees of the Seashore as well as for residents of the other communities on Fire Island and adjacent to the William Floyd Estate by applying appropriate prevention measures.	Adverse impacts would not be significant because the Seashore would make strides towards removing known hazards and applying appropriate measures to provide a safe and healthful environment for visitors to and employees of the Seashore as well as for residents of the other communities on Fire Island and adjacent to the William Floyd Estate. Beneficial impacts would not be significant because the Seashore already takes many steps to provide a safe and healthful environment for visitors and employees by removing known hazards and applying appropriate measures.	Adverse impacts would not be significant because the Seashore would make strides towards removing known hazards and applying appropriate measures to provide a safe and healthful environment for visitors to and employees of the Seashore as well as for residents of the other communities on Fire Island and adjacent to the William Floyd Estate. Beneficial impacts would not be significant because the Seashore already takes many steps to provide a safe and healthful environment for visitors and employees by removing known hazards and applying appropriate measures.	Adverse impacts would not be significant because the Seashore would make strides towards removing known hazards and applying appropriate measures to provide a safe and healthful environment for visitors to and employees of the Seashore as well as for residents of the other communities on Fire Island and adjacent to the William Floyd Estate. Beneficial impacts would not be significant because the Seashore already takes many steps to provide a safe and healthful environment for visitors and employees by removing known hazards and applying appropriate measures.
Seashore Operations	Adverse impacts on Seashore operations would not be significant because any change in the level of effort needed to manage the Seashore (management includes ensuring a safe and enjoyable visitor experience, protection of Seashore resources, maintenance of Seashore facilities, and Seashore administration) would be gradual and would not cause a noticeable change in administrative and supervisory responsibilities.	Adverse impacts on Seashore operations would be significant because considerable funding beyond current levels would be required for Seashore staff to ensure a safe and enjoyable visitor experience, protection of Seashore resources, maintenance of Seashore facilities, and Seashore administration.	Adverse impacts on Seashore operations would be significant because considerable funding beyond current levels would be required for Seashore staff to ensure a safe and enjoyable visitor experience, protection of Seashore resources, maintenance of Seashore facilities, and Seashore administration.	Adverse impacts on Seashore operations would be significant because considerable funding beyond current levels would be required for Seashore staff to ensure a safe and enjoyable visitor experience, protection of Seashore resources, maintenance of Seashore facilities, and Seashore administration.