National Park Service
U.S. Department of the Interior

FIRE ISLAND NATIONAL SEASHORE

Draft General Management Plan Environmental Impact Statement

2015

This draft General Management Plan/Environmental Impact Statement describes the resource conditions and visitor experience as they should exist at Fire Island National Seashore over the next 20 years. It presents three park-wide alternatives and two alternatives specific to the William Floyd Estate. One of which has been selected as the preferred option park-wide as well as one for the Floyd Estate. It also assesses the potential impacts of the alternatives on park resources, the visitor experience, park operations, and the surrounding area.

This document is available for public review for 90 days. The public review period will end 90 days after a Notice of Availability is published in the *Federal Register*. During the review period, the National Park Service will accept written and oral comments, which will be carefully reviewed and incorporated, as appropriate, in the final plan and final environmental impact statement.

You can submit comments via mail or online to the addresses below. Please note that names and addresses of people who comment become part of the public record. 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.

Please submit comments online to http://parkplanning.nps.gov/FIISGMP or via mail to:

Superintendent
Fire Island National Seashore
120 Laurel Street
Patchogue, NY 11772

For further information, please contact the Superintendent at:

Phone: (631) 687-4750
Fax: (631) 289-4898

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CREDITS

Design and concept
Chandler Design, Smithfield, Rhode Island
rebeccachandler.com

Diane Abell
Cover; pages iii, iv, 24, 29, 52, 57, 62, 70, 82, 112, 124, 127, 129, 166, 179, 189, 206, 213, 228, 235, 252, 305

Shapins Belt Collins
Pages 195, 256, 263, 282

Independence National Historical Park
Portrait of William Floyd, page 95

National Park Service/ Diane Abell
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National Park Service/ Fire Island National Seashore
Pages xv, 1, 4, 8, 21, 23, 26, 34, 39, 49, 75, 87, 90, 123, 130, 146, 149, 150, 162, 164, 183, 187, 191, 192, 196, 199, 200, 216, 232, 250, 260, 268, 273, 275, 279, 283, 296, 313

Preface

PLANNING FOR FIRE ISLAND AND FIRE ISLAND NATIONAL SEASHORE'S FUTURE: INTRODUCTORY REMARKS FROM SUPERINTENDENT CHRIS SOLLER

This document is the culmination of the National Park Service's extensive effort to draft a new General Management Plan for Fire Island National Seashore. At the heart of this planning effort has been the recognition that Fire Island is a special place and an important asset to the people of Long Island, New York State, and the nation as a whole. Fire Island encompasses important natural resources; significant recreation resources; cultural resources of national, state and local significance; and unique residential communities. Also at the core of this planning effort has been the acknowledgement that the long-term management and stewardship of Fire Island's many and varied resources and communities will require a different approach than has been traditionally taken over the 50 years since the National Seashore was established in 1964.

In 1964 the U.S. Congress recognized the importance of Fire Island to the nation and established the Fire Island National Seashore as a unit of the National Park System to protect and preserve some of these important resources. The United States in 2014 is a very different place than it was in 1964, as are New York, Long Island, and Fire Island. The establishment of Fire Island National Seashore was to some extent in response to a plan to build a road down the middle of Fire Island, but it also came out of a nation-wide movement to preserve important natural resources and create national parks and other types of preserves (wildlife refuges, national recreation areas) close to urban populations.

The tools and resources available in 1964 were thought to be all that were needed to set aside and preserve places like Fire Island. However, the experience of establishing national park areas in remote undeveloped areas in the west did not translate easily or effectively to highly urbanized areas in the east. The national environmental movement of the 1960s and 70s made state and local governments active players in the protection of resources. Over time, development pressures and the urbanization of places like Long Island have had impacts on places like Fire Island.

Today accelerated climate change and sea level rise are significant issues, and storm events such as Hurricane Sandy in 2012 highlight the vulnerability of places like Fire Island. The storm dramatically changed the geomorphology of Fire Island, reminding us of the fragile

nature of the narrow barrier beach. The devastation caused by the storm also causes us to rethink past decisions regarding where and how some of the country's most vulnerable areas have been developed. We also have to acknowledge that under current legislative and fiscal conditions, Fire Island National Seashore does not have sufficient authority or financial resources to adequately prepare for or respond to such a catastrophic event.

Today it seems clear that the tools and resources provided to the National Park Service to achieve Congress' vision for Fire Island National Seashore and Fire Island overall are also inadequate. The role outlined in 1964 for the National Park Service on Fire Island is very different than the role the National Park Service

plays in 2014, even though the 1964 role expectations are still in place. This General Management Plan (GMP) strives to ensure that the vision the Congress had in 1964 is achieved and provides guidance for continued success for the next 20 to 30 years largely in the context of our current authorities.

The GMP recognizes that many players are responsible for the stewardship of Fire Island's varied resources: Federal, state and local government entities; private organizations and both for- profit and not-for-profit entities; private homeowners and community organizations; and the general public. These entities often have conflicting roles and missions, and finding the common ground among them is critically important to a cohesive management approach for Fire Island.

The proposed GMP recognizes the important role the developed communities play on Fire Island as advocates and stewards of this place. It further accepts that there is constant interaction between the human or built environment and the dynamic natural landscape. Fire Island is a place where adaptation to and manipulation of the environment has shaped its distinctive character.

Four questions before the National Park Service and Fire Island's various stakeholders and interest groups are:

1. Is the vision of a Fire Island National Seashore -- to set aside a relatively undeveloped natural area close to an urban area like New York, where development is limited so that the natural resources and the natural processes of the barrier island can function as close to naturally as possible -- still a viable and worthwhile endeavor?
2. If this is a viable and worthwhile endeavor, who are the players that need to be involved in carrying out this endeavor, and what is the mechanism by which they come together and make both short- and long-term decisions, to ensure the continued success of the endeavor?
3. How do we bring the stakeholders together in a meaningful way at a time of crisis, such as a major storm event, to talk about the long-term and where we want Fire Island to be in 20 to 30 years?
4. How do we ensure that the decisions we make today and in the near future do not reinforce past practices that have left us vulnerable, but rather help us ensure a sustainable and more resilient Fire Island that is able to adapt and respond to future events and the unknown effects of climate change and sea - level rise?

Long-term success in achieving the vision that the Congress outlined for Fire Island will require collaborative stewardship. The GMP outlines several approaches for achieving that goal. In 2012 Hurricane Sandy underlined the need for a new approach for working collaboratively on Fire Island. The challenge for all of us who have a vested interest in Fire Island National Seashore is not to simply respond to crisis, but to lay the groundwork for a future that will be sustainable and achievable. This GMP provides the guidance and foundation for building that future.

Executive Summary

SEASHORE DESCRIPTION: Fire Island National Seashore (the Seashore), a unit of the National Park System, is located along the south shore of Long Island in Suffolk County, New York. The Seashore encompasses 19,580 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. Easily accessed on Fire Island are nearly 1,400 acres of federally designated wilderness, an extensive dune system, centuries-old maritime forests, solitary beaches and the Fire Island Lighthouse. 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 Fire Island, interspersed among the federal lands within the Seashore, are 17 residential communities that predate 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. The Seashore's enabling legislation includes provisions for private land to be retained and developed if zoning requirements are met. No hard-surfaced roads connect the communities either to each other or the mainland of Long Island. They are accessible mainly by passenger ferry or private boat. Vehicle use is restricted within the boundary of the Seashore on Fire Island. Without paved roads and with limited traffic, the communities have retained much of their original character.

During the summer season, the population of Fire Island swells to approximately 30,000 with a total of two to three million visitors each year. Recreational visitation to sites and facilities owned or managed by the Seashore in 2012 was 483,000. The Seashore's primary visitor facilities located on Fire Island are Fire Island Light, Sailors Haven, Watch Hill, and the Wilderness Visitor Center. Fire Island Light is maintained and operated by the Fire Island Lighthouse Preservation Society, which offers tours and other visitor programming. Concessioners operate the marina at Sailors Haven, as well as the marina and campground at Watch Hill. Located at either end of Fire Island and accessible by vehicle are major state and county beaches with sizable visitation.

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 about 15 miles east of Patchogue in the midst of a densely developed residential neighborhood in the village of Mastic Beach.

PURPOSE OF AND NEED FOR THE PLAN

A General Management Plan (GMP) is a comprehensive document that defines a national park's purpose and management direction and provides the overarching guidance necessary to coordinate all subsequent planning and management. The GMP for Fire Island takes the long view --15 to 20 years into the future-- and is meant to be a policy-level document that provides overarching guidance for Seashore managers. When approved, the Fire Island GMP will serve as the foundation for all subsequent planning and management decisions. All other plans will be based on the GMP.

The GMP has also been developed to meet the requirements of an environmental impact statement (EIS) pursuant to the National Environmental Policy Act of 1969, as amended (NEPA), and its implementing regulations (43 CFR 1500-1508), the Department of the Interior's NEPA regulations (40 CFR Part 46), and the NPS Director's Order #12 – *Conservation Planning, Environmental Impact Analysis, and Decision Making*. Once an alternative is selected as the approved GMP

and actions are implemented, additional site-specific compliance may be necessary for some actions and would be undertaken in accordance with all applicable requirements.

The draft GMP/EIS is made available for public review for 90 days. A Wilderness Management Plan was approved in 1983. As part of the current GMP planning process, proposals for the Fire Island Wilderness are described in the Common to All Action Alternatives section of Chapter Two and evaluated in Chapter Four. The Wilderness Management Plan, now referred to as a Wilderness Stewardship Plan (WSP), was updated to be consistent with the proposals in the GMP/EIS. The draft WSP that appears in Appendix D will undergo public review concurrently with the draft GMP/EIS. During that time, the team will solicit public comment and hold public meetings that will be publicized in local media outlets. The NPS will review and evaluate all comments received on the draft GMP/EIS. The results of the public and agency comments will be incorporated into a final GMP/EIS that will be made available to the public for a 30-day no-action period, after which a Record of Decision may be prepared to document the selection of an alternative as the approved GMP for the Seashore.

Planning Issues

Fire Island National Seashore's last GMP was completed in 1977. Since then, the Seashore's resource management responsibilities have evolved, as have the philosophies underlying best management practices. A number of newly introduced mandates, events, and other actions are affecting the management of the Seashore's resources. Likewise, issues related to climate change and sea-level rise, land use and development, shoreline management, and the changing needs and desires for public access and recreational use (e.g., boating, vehicular access) are affecting the Seashore's resource management practices.

Since 1977, a number of new management conditions and challenges have emerged:

- Seven miles of the barrier island became federally designated wilderness;
- Five federally listed threatened and endangered species have been identified;
- Vector-borne diseases like Lyme disease and West Nile Virus have emerged as resource management issues;
- The Seashore assumed responsibility for the management of two major cultural resource areas – Fire Island Light on the west end of the island and the 613-acre William Floyd Estate on Long Island; and
- Subsequent cultural resource studies have deepened our understanding of the full extent of cultural resources represented across Fire Island.

Through the project scoping phase of the GMP/EIS process, the planning team identified the following list of planning issues:

▸ ACKNOWLEDGING THE DYNAMIC CHARACTER OF THE BARRIER ISLAND/ ADDRESSING CLIMATE CHANGE & SEA-LEVEL RISE

Fire Island is constantly being shaped and re-shaped by wind and waves. The complex interaction of sediment, waves, and currents results in a dynamic landscape, with formations like beaches, dunes, and spits shifting overtime. Both natural factors and human activities affect the dynamic nature of the barrier island. Natural drivers of coastal change include but are not limited to periodic storms and floods, climate change, and sea-level rise. Human activities, such as continued development and efforts to protect existing development, also influence the geomorphology of Fire Island.

Climate change will result in significant effects on conditions at the Seashore including impacts from sea-level rise and potentially destructive storm events. More detailed examinations of these effects will be critical as actions envisioned in the GMP are analyzed and implemented at site-specific levels. Factoring in sea-level rise, these analyses will influence the type, design, location, and ultimate feasibility of park facilities and developments.

▸ RECOGNIZING A COMPLEX MOSAIC OF JURISDICTIONS

The Seashore is made up of approximately 19,580 acres of land and water. Of that only 32 percent is under federal ownership. The rest of the land and water within the Seashore's boundary is made up of privately owned and developed properties, Smith Point County Park (owned and managed by Suffolk County), and town and village marinas and beaches owned and managed by the towns of Brookhaven and Islip and the villages of Bellport, Ocean Beach, and Saltaire. On the western end of Fire Island National Seashore Robert Moses State Park abuts the Seashore. As previously stated, interspersed within

the Seashore are 17 diverse residential communities that were established before the Seashore's authorization.

Regulatory oversight for land use and development, water, sanitation, wildlife, coastal zone management, driving, and public health and safety is distributed across multiple jurisdictions within the Seashore boundary, including two incorporated villages (Saltaire, Ocean Beach), two Long Island-based municipalities (Brookhaven, Islip), Suffolk County, and multiple NY State agencies. These agencies have missions, mandates, and policies that frequently conflict with those of the NPS. As a result, the practical application of the NPS' Management Policies to non-federal properties within the Seashore boundary has presented challenges. The public often incorrectly believes and expects that the NPS has the authority to transcend these circumstances to effectively address a myriad of issues.

Federal zoning standards developed by the NPS and approved by the Secretary of the Interior have been incorporated (for the most part) into town and village zoning codes to regulate land use and development within the residential communities. The concept of employing the Secretary's zoning standards to address land use and development on private lands within the Seashore was originally based on the "Cape Cod Formula" applied at Cape Cod National Seashore. While the Cape Cod Formula has met with relative success in Massachusetts, it has not translated into success on Fire Island. The practice of granting variances is widespread, even when NPS has noted its objection and indicated that the property would lose its suspension from the condemnation authority of the Secretary of the Interior. The towns and villages grant variances based on precedent, making it very difficult to deny subsequent applications. Further, NPS has neither the financial resources nor the political support to engage in condemnation of these properties. As a result the federal zoning in its current application has not been a particularly powerful tool for controlling development on Fire Island.

The mosaic of public and private entities, each with its own purposes, policies, guidelines, and management approaches has resulted in confusion and frequent conflicts for management of Fire Island. No existing mechanism effectively enables planning, communication, and cooperation across the various entities. A new management paradigm is needed to make the Island "whole" and to foster cooperative stewardship in its management.

▸ REINTERPRETING ISLAND RESOURCES

Since its establishment in 1964, the Seashore has been recognized almost exclusively for its natural resource values. The Seashore's 1977 GMP identified the "primary management concern" as "preservation and enhancement of the serenity and natural beauty of the Island, which includes the protection of the beaches, dunes, and other natural features fundamental to the concept of Fire Island National Seashore." Since 1977, additional research has been completed on the historic resources of Fire Island, including a Historic Resource Study (1979), Archeological Overview and Assessment (2005), and an Ethnographic Overview and Assessment (2006).

These reports reveal a rich cultural heritage, with some communities and institutions (e.g., U.S. Life Saving Service) having their roots on Fire Island in the mid-19th century. Prior to its inception as a resort area in the 1880s, Fire Island had been put to agricultural and industrial use for generations. While the significance of the natural resource values of Fire Island is not in dispute, it is important to recognize that Fire Island is a cultural landscape that has been and continues to be shaped both by human intervention and the forces of nature.

Failure in recognizing the importance of this interrelationship between the human and natural dimensions of Fire Island has resulted in policies and management strategies that have been difficult to advance.

▸ PLACING NEW EMPHASIS ON MARINE/ OCEAN-BASED RESOURCES

In the past, management of the Seashore—as with other coastal national parks and seashores—has focused more on terrestrial rather than on aquatic resources. Yet Fire Island's boundaries extend 4,000 feet on average into the Great South Bay, and 1,000 feet into the Atlantic Ocean, encompassing a wealth of submerged and tidal resources, both natural and cultural. Over 70 percent of the Seashore is submerged. In recent years Seashore officials have become increasingly concerned about the protection of these marine resources. At the same time, the NPS has been affirming its commitment to marine resource protection service-wide, through development of new plans and initiatives.

▸ BROADENING THE PARK'S VISITATION

The Seashore offers a wide range of recreational activities and facilities to the visiting public. In 2012 the park's recreational visitation was approximately 483,000. However, the economic, ethnic, and geographic diversity of the Seashore's audience has remained limited, particularly compared with the demographics of the nearby metropolitan New York region. Some Seashore areas are heavily used, with little visitor infrastructure. Other facilities could handle increased public use. Opportunities to expand outreach and accessibility, strategies for broadening the Seashore's audiences, and measures to ensure that the Seashore's resources and stories are relevant to current and future generations of Americans must be considered.

▸ ADDRESSING AGING INFRASTRUCTURE

The Seashore's physical infrastructure is complex and serves visitors and staff at several locations on Fire Island and Long Island. The Seashore maintains over 10 miles of boardwalk and operates over 90 buildings, including the historic William Floyd Estate and the Fire Island Light Station. Many of the Seashore's visitor facilities and supporting infrastructure are over 25 years old and are located on Fire Island, making them vulnerable to severe weather and storms, and difficult to operate and maintain. Because of the linear character of Fire Island and reliance on water-based transportation, the Seashore's visitor facilities are hard to reach for both the visiting public and the facilities management staff. Similar issues are associated with Seashore staff housing on Fire Island. On Long Island, the Seashore's headquarters and the Patchogue Maintenance Facility are located just under one-half mile apart.

▸ THE WILLIAM FLOYD ESTATE

The William Floyd Estate (the Estate) encompasses the remaining 613 acres of the original "plantation" operated by William Floyd, who signed the Declaration of Independence as a representative of New York. In 1965 Floyd family descendants donated the Estate, composed of 27 buildings, structures, and major landscape features, as well as thousands of personal effects and historical artifacts, to the NPS. The NPS assumed responsibility for the main house (Old Mastic House) in 1975, but did not acquire full management responsibility for the entire property until 1991. The Estate is located on Long Island adjacent to the village of Mastic Beach and is different in purpose and character from the larger portion of the Seashore on Fire Island. The 1978 Development Concept Plan – Interpretive Prospectus provided the primary guidance for management of the Estate. Throughout its NPS administrative history, the Estate's preservation and programming have been subject to funding shortfalls and staffing limitations. The maintenance function at the Estate is spread across a number of small sheds near the existing curatorial storage building. This maintenance facility also serves the east end of Fire Island. Maintenance projects requiring indoor space must be transported and completed at the Patchogue Maintenance Facility 15 miles to the west. Management options for the Estate aimed at improving the outlook for its long-term preservation and interpretation must be considered.

Responding To Climate Change

Over the last decade, the NPS has consulted with the scientific community, federal agencies, non-profit organizations, and other informed parties to gather data and explore strategies to prepare the national park system for potential future impacts of a changing climate. Sea-level rise, extreme precipitation events, heat waves, and increases in severe winds or other phenomena related to climate change will alter how natural and cultural resources are managed, and the types of activities, facilities and infrastructure the NPS can support.

Climate change is expected to result in many changes to the Atlantic coast, including the northeastern coast of the United States. Both historical trends and future projections suggest increases in temperature, precipitation levels, accelerated rates of sea-level rise and intensity of weather events, such as storms, should be expected. In addition, climate change is expected to affect Fire Island's weather, resources (e.g., shorelines, vegetation, wildlife, historic sites, and archeological resources), and visitor use patterns. These changes will have direct implications on resource management, recreational facilities, park operations, and visitor use and experience. Some of these impacts are already occurring or are expected at Fire Island in the time frame of this GMP.

All of the alternatives described in this GMP/EIS include elements that will support the resilience of the national seashore relative to the anticipated impacts from climate change, such as sea-level rise, coastal erosion, and more frequent and stronger storms, all of which may affect cultural and natural resources, as well as visitor experience at the seashore.

A Climate Change Response Strategy is outlined in Chapter Two.

Description of the Alternatives and Their Impacts

The Seashore includes two separate and distinct units – Fire Island and the William Floyd Estate (the Estate). The Seashore's headquarters and primary maintenance facility are located in the village of Patchogue, as is the Ferry Transportation Center that serves Watch Hill on Fire Island. The units are separated by the Great South Bay and are vastly different in terms of composition and overall character. To properly address the future needs of these units, two separate sets of management alternatives have been developed. While some common elements apply to both units, the management alternatives are organized somewhat differently and are presented in separate sections.

The Otis Pike Fire Island High Dunes Wilderness Area (referred to as the Fire Island Wilderness) is also addressed in the draft GMP/EIS. The general management direction proposed for the Fire Island Wilderness is described in this chapter. Consistent with direction that the planning team received from the NPS Wilderness Stewardship Office in Washington, DC, a draft Wilderness Stewardship Plan appears in the appendix of the draft GMP/EIS. The Wilderness Stewardship Plan is considered an implementation plan that would normally be completed after the GMP is approved and would be written to be consistent with that approved document. A final Wilderness Stewardship Plan will be approved and released concurrent with the final GMP/EIS.

Management Alternative 1:

CONTINUATION OF CURRENT MANAGEMENT PRACTICES (NO-ACTION ALTERNATIVE)

Management Alternative 1 is considered the "No-Action" alternative. Under this alternative, current management practices and the use of approved and interim plans would continue. NPS would continue to collaborate with local, county, and state officials on an as-needed basis to address common regulatory, policy, and management issues. The NPS would continue to meet day-to-day operations, management, legal, and regulatory requirements based on existing plans and the availability of funds. A number of current management practices would be expected to continue regardless of which alternative is ultimately adopted.

The Seashore would continue to work to preserve the natural environment and take actions to retain and enhance natural processes. A number of ongoing projects and programs would continue, including the Mosquito Management Plan, and inventory and monitoring of the park's natural resources. The Seashore would also adhere to the tenets of the Tentative Federally Support Plan (TFSP) as part of the Fire Island to Montauk Point Reformulation Plan (FIMP).

The Seashore's cultural resource management would continue to focus exclusively on resources on federal lands, particularly at the Fire Island Light Station and the William Floyd Estate. The Seashore would rehabilitate or restore cultural resources based on priority and would continue to identify, manage, and protect submerged and other archeological resources. Park collections would continue to be housed in the curatorial storage facility at the William Floyd Estate.

The Seashore would continue to rely on the existing federal zoning standards for land protection and would continue to review applications for variances, exceptions, permits for commercial or industrial use, or special permits submitted to the zoning authority and provide a written response indicating whether the proposal conforms to the Secretary of the Interior's Zoning Standards or the purposes of the Seashore's enabling legislation. The NPS authority to address development that is inconsistent with federal zoning would continue to be limited. Within the communities, properties damaged or destroyed by overwash or storm surges would continue to be repaired or rebuilt, consistent with existing zoning standards.

Under this alternative, the visitor experience would remain somewhat segmented, with visitors to Seashore facilities largely staying within those facilities and visitors and local residents of communities largely staying within their individual communities. Current efforts to make more people aware of the presence of the national seashore would continue. The Seashore would continue to offer a broad slate of visitor programs at selected locations on a limited schedule as funding and staffing permit. The Seashore's informational website, exhibits, brochures, and other publications would continue to be available.

The existing Seashore facilities at Fire Island Light Station, Sailors Haven, Talisman, Watch Hill, the Wilderness Visitor Center, and the William Floyd Estate

would remain largely unchanged and would be staffed at current levels. Facilities would be evaluated and upgraded as appropriate in the context of their regular maintenance cycle and consistent with NPS "Green Park" and facility management standards to address environmental concerns, the impacts of sea-level rise and climate change, and consistency with the Americans with Disabilities Act (ADA). The Seashore's administrative headquarters and maintenance shop would continue in their present locations on the Patchogue River in the village of Patchogue and would be rehabilitated to address operational and environmental deficiencies.

There are few significant impacts associated with Management Alternative 1. This management alternative is likely to result in both beneficial and adverse impacts across all impact topic areas that vary in duration and are likely to be only slightly detectable relative to current conditions.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

Cooperative Stewardship

The NPS would commit to Cooperative Stewardship and would work collaboratively with Fire Island communities and other relevant entities to improve land use planning and regulations and to protect the environmental quality and distinctive character of Fire Island. To accomplish this, the NPS would propose the creation of a regular forum for communication, coordination, and collaboration in managing Fire Island. Two distinct alternative approaches are being considered, one of which could be adopted to create a forum for regular communication, cooperation, and collaboration.

Coastal Land Use and Shoreline Management Plan

The NPS would assume a leadership role in working with Fire Island communities, the towns of Islip and Brookhaven, Suffolk County, and New York State to develop a coastal land use plan for Fire Island. The plan would be consistent with the Tentative Federally Supported Plan (TFSP) for FIMP and would articulate a comprehensive strategy for protecting coastal resources while accommodating land use development within the coastal zone on both federal and non-federal lands within the Seashore. The plan would address shoreline protection, land use controls, site planning, and design standards as well as post-storm response in the context of the dynamic barrier environment and emerging trends resulting from sea-level rise and climate change. The plan must be undertaken and adopted as a multi-lateral, collaborative effort.

Marine Resources

Under Management Alternatives 2 and 3, the NPS would engage in partnership opportunities at the Seashore with federal, state, and local agencies and non-governmental organizations to enhance marine resource research, monitoring, conservation, and education with particular emphasis on waters within the Seashore's boundary, acknowledging the larger context of these resources in the Great South Bay and Atlantic Ocean.

The NPS would work with others having jurisdictional authority to address both natural and cultural marine-based resources to develop a Marine Resources Management Plan for submerged lands and shared resources of the Seashore. The Marine Resource Management Plan would define NPS roles and priorities and would recommend collaborative management strategies to promote the long-term protection and sustainability of marine resources within the larger contexts of Great South Bay and the Atlantic Ocean.

The NPS would collaborate with other stakeholders across a broad spectrum of interests to restore the Seashore's native animal and plant communities (e.g., eel grass, clam beds). The ultimate aim of these efforts would be to protect and, where feasible, to restore the natural abundance, diversity, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems where they occur.

Land Use and Development

The NPS would collaborate with others to revise the Secretary's zoning standards and to address local land use regulations, to address inconsistencies, provide greater specificity and/or guidance, and to define with greater clarity the role of NPS. Alternatives to traditional zoning would be encouraged. The NPS would work collaboratively with others to encourage, support, and cooperate with Fire Island communities and the towns of Islip and Brookhaven in the identification and preservation of the distinctive character of each Fire Island community and Fire Island as a whole. The NPS would pursue the realignment of the Federal Dune District, to be either co-terminus with the NYS Coastal Erosion Hazard Area (CEHA) or dropped entirely,

whereby CEHA would become the officially designated and legislated line for federal zoning purposes.

Wilderness

The NPS is preparing a new Wilderness Stewardship Plan for the Fire Island Wilderness that is broadly addressed and evaluated in this draft GMP/EIS. Early in the planning process, the national office of the NPS Wilderness Stewardship Program requested that wilderness planning be integrated with the Seashore's GMP to ensure that it was given full consideration as other proposals within the GMP/EIS were developed and evaluated for environmental compliance.

A more detailed draft Wilderness Stewardship Plan that, when approved and adopted, would supersede the 1983 Wilderness Management Plan, appears in Appendix D of this document. Because the proposed actions related to the Fire Island Wilderness are considered to be common to all action alternatives, it was deemed appropriate to release these documents concurrently.

The Fire Island Wilderness would continue to be managed to maintain its wilderness character consistent with the Wilderness Act. Specifically addressed are the qualities of being untrammeled, natural, and undeveloped; its ability to provide opportunities for primitive and unconfined recreation, and other unique features as deemed important to the Fire Island Wilderness.

Due to the removal of the incompatible features related to the Smith Point West Nature Trail and the loss of Old Inlet facilities resulting from Hurricane Sandy in 2012, these areas (approximately one acre) will be designated as Wilderness upon publication of a notice in the Federal Register.

The NPS would no longer maintain formal dune crossings into the Fire Island Wilderness that connect to a trail that in places follows the historic path of the Burma Road. In their stead, the Seashore would place temporary markers on the beach face to indicate appropriate places for visitors to access the Fire Island Wilderness. The through trail would be minimally maintained to accommodate foot traffic. The Smith Point West Nature Trail (approximately 1,000 feet) would be maintained by the NPS.

Management Alternative 2:

ENHANCING NATURAL RESOURCE VALUES

Under this alternative, greater emphasis would be placed on the protection and restoration of natural, ecological systems, patterns, and resources on federal lands. A nature-based park experience would be emphasized, and the overall development footprint of the Seashore would be reduced. Visitor use and activity would be carefully distributed and accommodated in a manner that protects the Seashore's resources. A proactive, collaborative approach to stewardship among existing and new partners would be considered fundamental to the plan's success.

Under this alternative the Seashore would work with its partners to pursue a proactive program of natural resource protection within the Seashore and would seek to restore degraded or damaged ecosystems, as feasible.

The treatment of cultural resources would be similar to what is described under Management Alternative 1, with continued emphasis on the Fire Island Light Station and the William Floyd Estate. As funding becomes available, the NPS would continue to work to preserve cultural resources undertaking appropriate preservation treatments. The curatorial storage facility would be reorganized and refurnished for greater efficiency. The Seashore would expand its natural resource/ natural history collection for interpretive and research purposes.

While visitors would continue to enjoy access to and interpretation of cultural resources at the William Floyd Estate and the Fire Island Light Station, under this alternative the visitor experience in the Seashore would center on close contact with and immersion in the natural landscape. Clearly organized access routes would minimize the disturbance of natural resources, with access to some areas being restricted and some different types of uses that are "lighter on the land" being encouraged. Physical connections between Seashore sites and the communities would continue to be limited or even diminished. Personal media (e.g., web-based downloads, cell phones, iPods, brochures) and services rather than physical exhibits, museums, and waysides would be emphasized in providing visitor information and programming.

Under this alternative, the Seashore would reduce the number of facilities where deemed appropriate. The Seashore's Sailors Haven marina would be removed, but the ferry dock would be retained and off shore moorings

would continue. The current system of boardwalks and trails would be retained and maintained to ensure protection of the Seashore's natural resources, while still providing opportunities for visitors to experience a more natural barrier island environment. Under this alternative, the NPS would minimize development on the edges of the Fire Island Wilderness. The existing Wilderness Visitor Center would be replaced with a small visitor information kiosk and restroom facility. Minimal services including lifeguards and restrooms would be provided for visitor safety at Sailors Haven and Watch Hill. The campground at Watch Hill would be removed and a new campground would be developed at a more suitable location on Fire Island. The new campground would be located at Sailors Haven, Talisman, or Watch Hill and would be considered in the master planning process for each of these locations. While concessioners would continue to operate the Watch Hill Marina, the NPS would assume responsibility for campground operations on Fire Island.

Several significant beneficial or adverse impacts are associated with Management Alternative 2. The emphasis on the restoration of natural systems, and an aggressive approach to managing non-native, invasive species would be of significant, long-term benefit to vegetation. The rehabilitation of the cultural landscape at the Fire Island Light Station would be readily apparent and would be considered significant beneficial impacts to the cultural landscape. The proposed rehabilitation of historic structures would be of benefit throughout the Seashore.

Minimizing development on the edges of the Fire Island Wilderness and the emphasis on ecological restoration would result in substantive changes and would contribute to protecting wilderness character. The removal of visitor facilities, changes in visitor programming and access, and the emphasis on interaction with the natural environment would substantially change the way visitors experience many of the Seashore's sites and facilities on Fire Island. This change could be viewed as positive by some and negative by others. The eventual removal of the marina at Sailors Haven would represent a substantial change and would be considered a significant adverse impact to transportation and access on Fire Island, particularly for the private boating community.

Land use and development proposals would be of long term benefit to the overall character of Fire Island and to the management of land use and development, including technical assistance to Fire Island communities to identify and preserve their distinctive community character, and revisions to land use regulations such as alternatives to traditional zoning. A commitment to cooperative stewardship and carrying out the proposed changes to visitor facilities and the visitor experience on Fire Island could affect visitation and would have both adverse and beneficial effects on the local and regional economy. Likewise, proposals involving construction activity and increases in Seashore staff could also have a beneficial effect on the local and regional economy. A commitment to cooperative stewardship would also have an impact on the organization of Seashore staff.

Management Alternative 3:

RECOGNIZING THE RELATIONSHIP BETWEEN HUMAN USE AND NATURE (NPS PREFERRED ALTERNATIVE)

This alternative acknowledges that Fire Island is a natural landscape with a significant cultural overlay and recognizes the strong connection between natural and cultural resource protection and human use. Historically, human use and development have reflected and responded to the natural qualities and character of the barrier island environment on Fire Island in how it has been used, adapted to, and manipulated. Through a proactive and collaborative management approach, the NPS would seek an appropriate balance between continuing human use and protecting Fire Island's fragile environment.

The Seashore experience and interpretation would recognize the relationship between human involvement with the dynamic natural landscape of the barrier island. Fire Island would be explored from the perspective of the pre- and post-contact history of Long Island and New York Harbor, from its early use for agricultural and maritime purposes to its emergence as a distinctive vacation destination and finally a National Seashore. In considering Fire Island's human history, the relationship to the natural environment would be central, as that story of adaptation and manipulation has shaped the place that exists today and will influence how the NPS, Fire Island communities, and other Seashore stakeholders respond to the effects of climate change and sea-level rise.

The NPS would also engage in outreach and collaborative efforts that would enhance the public's understanding and appreciation of the Seashore within its regional historic, cultural, and natural context.

Existing infrastructure would be retained and, over time, would be improved and/or reoriented to be greener, more efficient, and better adapted to the coastal environment. Any new development meant to create improved opportunities for visitor use and appreciation of resources would be limited to existing visitor use areas and would be undertaken only after appropriate climate change and sea-level rise assessments have been completed.

Under this alternative, natural resource management would be similar in approach to Management Alternative 1. However, similar to Management Alternative 2, the Seashore would work to restore the Sunken Forest and other maritime forests on Fire Island, improve water quality through the development and implementation of a wastewater management plan, and engage in more intensive management of non-native invasive species. Cultural resources would be considered throughout Fire Island through a comprehensive cultural landscape report that examines the history of Fire Island as a whole and its various stages of use and development. The Seashore would also offer technical assistance to Fire Island communities seeking to inventory, protect, and interpret their own cultural resources. Under this alternative, an addition to the existing curatorial storage facility would also be proposed to provide sufficient space for storage, conservation, and research.

Under this management alternative, the Seashore experience would stress the connections between the natural and cultural environment and offer a more integrated visitor experience on Fire Island and at the William Floyd Estate. Through collaborating on programs and special events, the NPS would create more opportunities to link the Seashore experiences between Fire Island communities and the Seashore. The NPS would work to increase the distribution and dispersion of visitors across Seashore facilities and encourage a broad range of experiences.

The NPS and its partners would offer a diversity of opportunities – educational, recreational, water-based, land-based, interpretive, and virtual – that would be designed to engage diverse audiences that are representative of the tri-state area demographic, and delivered by a range of personal and non-personal services and media. The visitor experience would draw on regional connections to encourage visitors to seek out related resources on Long Island (e.g., Wertheim National Wildlife Refuge, Long Island Maritime Museum, the Manor of Saint George, etc.) to enhance their understanding of Fire Island.

The major visitor service areas within the Seashore would be retained, and the expansion of some areas would be considered. Existing facilities would be retained and, over time, would be improved and/or reoriented to be greener, more efficient, and better adapted to the coastal environment. The Sailors Haven marina would be redesigned to minimize the erosion that has been undermining the Sunken Forest. The Wilderness Visitor Center would be rehabilitated to improve universal accessibility and update interpretive media. The NPS would also work collaboratively to re-establish a residential environmental education program that would be housed in existing facilities during the Seashore's shoulder seasons.

Several significant beneficial impacts are associated with this Management Alternative 3. The emphasis on the restoration of natural systems, and a more intensive approach to managing non-native, invasive species would be considered to be of significant long-term benefit to vegetation. The rehabilitation of the cultural landscape at the Fire Island Light Station, the completion of a Fire Island-wide cultural landscape report, the rehabilitation of a number of historic structures, and efforts to document and develop a management plan for archeological resources would be of long-term benefit to the Seashore's cultural resources. The expansion of the curatorial storage facility would have a beneficial impact on the use and protection of museum collections.

The emphasis on understanding and experiencing Fire Island holistically and within its broader context as described under this alternative would result in beneficial impacts, including broadening the visitor experience to address both the natural and cultural heritage of Fire Island and its regional context. Land use and development proposals including technical assistance to Fire Island communities to identify and preserve their distinctive community character; and revisions to land use regulations including alternatives to traditional zoning would be of long-term benefit to the overall character of Fire Island and to the management of land use and development. A commitment to cooperative stewardship as well as enactment of proposed changes to visitor facilities and the visitor experience on Fire Island could increase visitation and would have a beneficial effect on the local and regional economy. The commitment to cooperative stewardship would have an impact on the organization of the Seashore staff. Likewise, proposals involving construction activity and increases in park staff could also have an effect on the local and regional economy.

The William Floyd Estate

The William Floyd Estate (the Estate) is a separate and distinct unit of Fire Island National Seashore with its own unique characteristics. To properly address the future needs of the Estate, workshops and alternative planning concepts were developed separately from the overall planning effort for Fire Island National Seashore.

The following critical planning priorities were defined for the Estate:

▸ DEFINING THE MESSAGE

Work with other entities to develop a consistent message that defines the Estate's significance, themes, and objectives and also broadens understanding and appreciation of the William Floyd Estate locally, nationally, and globally and within the context of Fire Island National Seashore and the National Park System.

▸ EDUCATION DESTINATION

Establish the Estate as a place for research and education. Become a living classroom that builds understanding for the cultural and historical significance of the property through engaging, hands-on activities and tangible examples of the historic uses of the site.

▸ ACCESS

Ensure the Estate is easy to find and available to the public on a regular basis. Provide a facility that orients visitors and provides space for educational programs throughout the year.

▸ HEALTH, SAFETY, AND SECURITY

Ensure that visitors have a safe and healthy experience that fosters their understanding and appreciation of the Estate. Create an appropriate monitoring and security system to ensure the site's long-term protection.

▸ IMPROVING RELATIONSHIPS

In collaboration with others, establish a broad range of diverse and lasting partnerships with other sites, institutions, and museums that encourage educational opportunities for a wide array of audiences and foster long-term stewardship of the property.

Management Alternative A

THE ESTATE'S CURRENT MANAGEMENT (NO-ACTION ALTERNATIVE)

Management Alternative A – The Estate's Current Management is considered to be the No-Action management alternative. Under the No-Action alternative, current management practices and the use of approved and interim plans would continue. The NPS would continue to collaborate with local, county, and state officials on an as-needed basis to address policy and management issues. The Estate would continue to meet day-to-day operations, management, legal, and regulatory requirements based on existing plans and the availability of funds.

The Old Mastic House would continue to be preserved and furnished to reflect the family's use and occupancy. One room would continue to serve as an introductory exhibit space, while another would serve as a small sales area. NPS would undertake work to correct structural issues at the Old Mastic House.

The NPS would prepare a Cultural Landscape Report (CLR) and Treatment Plan for the Estate. Consistent with the recommendations of the CLR and Treatment Plan, the Lower Acreage would continue to be managed as a cultural resource and would be monitored to retain its natural resource values. The historic cemetery would continue to be preserved and maintained.

The NPS would develop an outreach initiative so that the Estate and its history would become better known locally, regionally, and nationally. To do this effectively, the Estate's hours and season of operation would be expanded as funding becomes available. Working in conjunction with the village of Mastic Beach and others, the NPS would improve wayfinding to the William Floyd Estate through a diversity of means. These would include signs, maps and other information located at key places in the area.

The existing collection of maintenance sheds in the northeastern section of the Estate would continue to serve as the storage and preservation area for maintenance and operational activities at the Estate and on the east end of Fire Island.

There are few significant impacts associated with Management Alternative A. This management alternative is likely to result in both beneficial and adverse impacts

across all impact topic areas that vary in duration and are likely to be only slightly detectable relative to current conditions.

Management Alternative B

HISTORICAL PARK AND MUSEUM (NPS PREFERRED ALTERNATIVE)

This alternative would advance the vision of the William Floyd Estate as a historical park and museum where visitor activities and experiences would focus on understanding and appreciating the historical relevance of William Floyd and his descendants, the evolution of the site from agricultural plantation to recreational retreat, and the political, social, and economic forces that shaped this family and their use of the property. The value of the Estate as a large area of undeveloped land in a developed community would be more fully recognized.

Cultural, natural and recreational opportunities would be expanded as appropriate within the context of the Estate's purpose and significance. The interpretative emphasis would be broadened to embrace more of the property's historic regional context, with more collaborative exhibits and programming taking place with other institutions, both on and off-site.

As in Management Alternative A for the Estate, NPS would undertake work to correct structural issues at the Old Mastic House. However, under this alternative the orientation exhibit and sales area would be removed, and all the spaces in the home would be furnished to illustrate the continuum of family use. The existing structures and selected landscape features (e.g., garden, portions of the orchard) within the historic core would be rehabilitated and interpreted. Relevant missing structures and features would be interpreted to help visitors understand the Estate's history.

The NPS would prepare a Cultural Landscape Report (CLR) and Treatment Plan for the Estate. Consistent with the recommendations of the CLR and Treatment Plan, in the Lower Acreage, the existing cultural landscape features (e.g., fields, marshlands, the Vista, ponds, and remnants of the corduroy road and lopped tree fence system) would be retained and rehabilitated. Landscape vignettes (e.g., introduction of cultivated fields in some locations) would be created to evoke different periods in the Estate's history in support of interpretive objectives.

For many, the visitor experience at the Estate would begin at a rehabilitated visitor facility near the existing parking area. The facility would build upon existing visitor infrastructure including restrooms and an orientation kiosk and would provide a versatile and safe indoor orientation and program space for a variety of audiences, but particularly school children. Indoor and outdoor program spaces would be available for presenting day and evening programs as well as orienting and staging school groups and providing a sheltered area for lunch.

The NPS would also collaborate with the village of Mastic Beach to explore the possibility of creating an off-site orientation exhibit about the Estate in the village itself. As in Management Alternative A, the NPS would work in conjunction with the village of Mastic Beach and others to improve wayfinding to the Estate through diverse means, including signs, maps and other information located at key places in the area.

Building upon the existing maintenance shop, the NPS would develop a consolidated maintenance facility at the Estate that house the primary functions within a single structure. The consolidated facility would offer safe and sufficient space to support the maintenance and preservation operations for the Estate as well as the east end of the Seashore.

Several significant impacts would be associated with Management Alternative B at the Estate. The rehabilitation of the cultural landscape and historic structures and the relocation of non-historic functions from historic buildings would have a notable, long-term beneficial impact on cultural resources at the William Floyd Estate.

Improvements to the parking and circulation system at the Estate would be of long-term benefit relative to transportation and access to the site. The rehabilitation of the cultural landscape and historic structures as well as

improvements to visitor facilities and visitor programming could result in expanded visitor use and enhanced visitor experience. Greater visitation would have a beneficial effect on the regional economy.

IDENTIFICATION OF THE AGENCY PREFERRED AND THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The **Agency Preferred Alternative** (43 CFR 46.420d) is the alternative which the NPS believes would best accomplish the purpose and need of the proposed action while fulfilling its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. It may or may not be the same as the bureau's proposed action or the environmentally preferable alternative.

Management Alternative 3, in combination with Management Alternative B as described for the William Floyd Estate, has been identified as the NPS preferred alternative because it best meets the Seashore's management goals and conveys the greatest number of significant beneficial results relative to its potential impacts in comparison with other alternatives. Management Alternative 3 would do the most to ensure the cooperative stewardship of Fire Island National Seashore's dynamic coastal environment and its cultural and natural systems while recognizing its larger ecological, social, economic, and cultural context. This combination would also meet the specific needs and management goals related to the William Floyd Estate.

In accordance with the DO-12 Handbook, the NPS identifies the environmentally preferable alternative in its NEPA documents for public review and comment [Sect. 4.5 E(9)]. The **environmentally preferable alternative** is the alternative that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative (43 CFR 46.30).

After evaluating the potential impacts of the management alternatives on cultural and natural resources, the NPS has determined that Management Alternative 3 in combination with Management Alternative B as described for the William Floyd Estate is the environmentally preferable alternative because it best protects, preserves, and enhances the Seashore's natural, cultural, and recreational resources. Management Alternative 3 proposes that Fire Island National Seashore be considered holistically – including its natural, cultural, and recreational values – and that it be understood within its regional context, resulting in a more effective approach to achieving these results.

HOW TO READ THIS PLAN

This plan is divided into five chapters:

▸ CHAPTER 1

Foundation for Planning describes the reasons why the general management plan (GMP) is being prepared. Chapter 1 presents the Seashore's purpose and significance statements and describes the fundamental resources and values that are critical to achieving the Seashore's purpose and maintaining its significance. This section also describes the issues addressed in the plan.

▸ CHAPTER 2

Alternatives describes the no-action alternative and two action alternatives for Fire Island. It also describes a no-action and an action alternative for the William Floyd Estate. A description of management areas that describe the desired resource conditions, desired visitor experience, as well as levels of management and development intensity is also presented.

▸ CHAPTER 3

Affected Environment describes the existing resources and conditions that could be affected by implementing any of the alternatives.

▸ CHAPTER 4

Environmental Consequences summarizes the proposed actions and describes the potential impacts on the Seashore's resources and values and the socioeconomic environment that could result from implementing any of the alternatives.

▸ CHAPTER 5

Consultation, Coordination, and Compliance describes the planning process, public involvement, and agency coordination undertaken during the development of the GMP. Compliance requirements are also summarized.

▸ APPENDICES

The appendices provide additional supporting technical data and relevant background material cited throughout the plan. This includes the complete draft Wilderness Stewardship Plan that is being made available for review concurrent with the draft GMP/EIS.

HOW TO COMMENT ON THIS PLAN

Comments on this draft GMP/EIS are welcome and may be submitted during the 60-day review and comment period, using one of the methods noted below.

- **Online:** http://parkplanning.nps.gov/fiis

We prefer that readers submit comments online through the park planning website identified above which incorporates the comments into the NPS Planning, Environment, and Public Comment (PEPC) system. An electronic public comment form is provided through this website.

- **Mail**: Fire Island National Seashore GMP
  15 State Street
  Boston, MA 02109
  Attn: Ellen Carlson
- **Fax**: 617.223.5164
  Attn: Fire Island GMP (Ellen Carlson)
- **Hand Delivery:** Comments may be dropped off at Seashore headquarters (120 Laurel Street, Patchogue, NY 11772) or at public meetings, which will be announced in the local media following the release of this plan.

Please note that the names and addresses of people who comment become part of the public record. 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. While you can ask us in your comment to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

All comments on the draft GMP/EIS will be reviewed and considered. Substantive comments will be identified and responded to in a Comment Analysis Report that will appear in the final GMP/EIS.

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1: Plan Purpose & Foundation for Planning

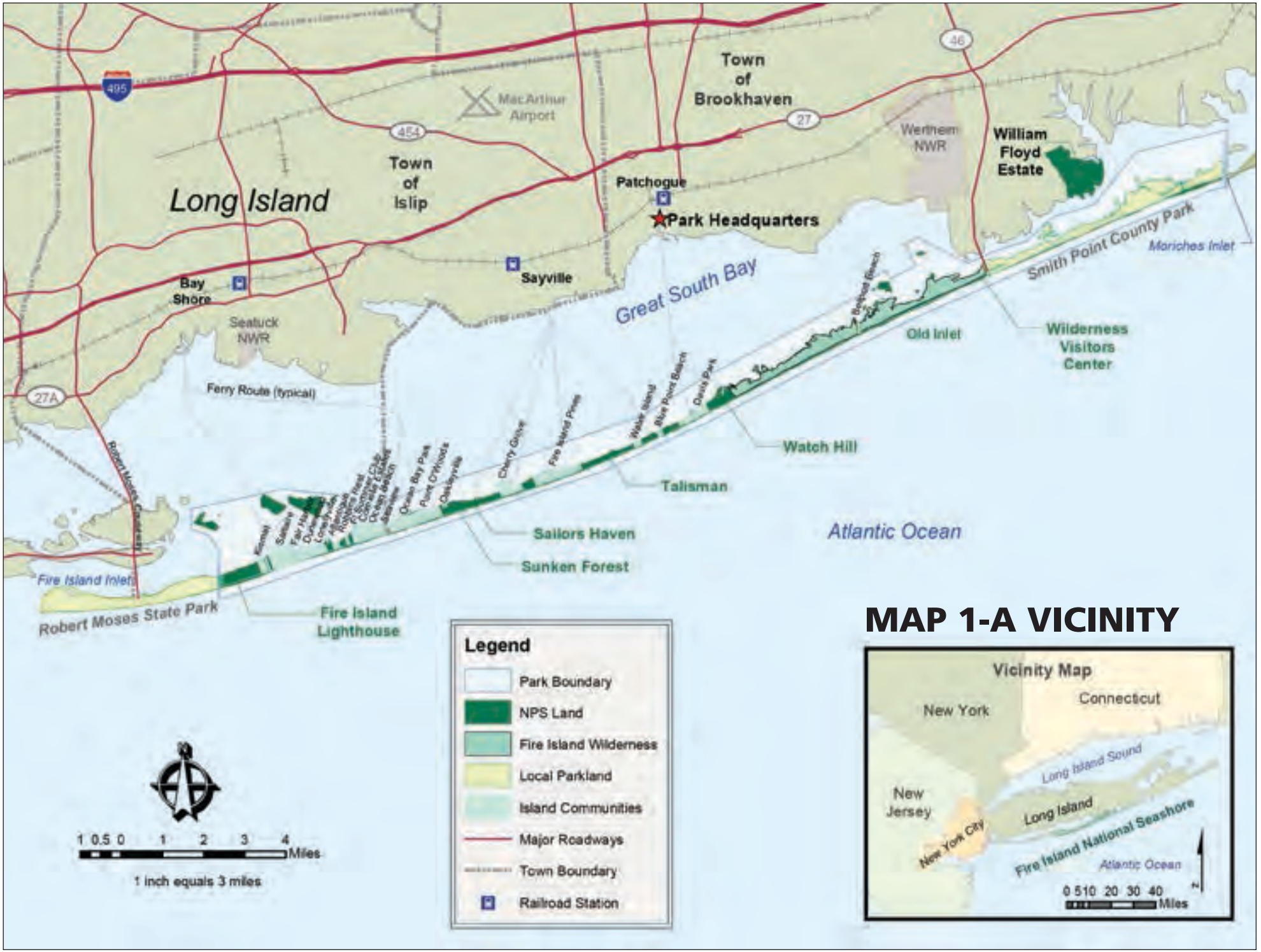
INTRODUCTION Fire Island National Seashore (the Seashore), a unit of the National Park System, is located along the south shore of Long Island in Suffolk County, New York. The Seashore encompasses 19,580 acres of upland, tidal, and submerged lands along a 26-mile stretch of the 32-mile barrier island 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. Easily accessed on Fire Island are nearly 1,400 acres of federally designated wilderness, an extensive dune system, centuries-old maritime forests, solitary beaches and the Fire Island Light. 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 Fire Island, interspersed among the federal lands within the Seashore are 17 residential communities that predate 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. The Seashore's enabling legislation includes provisions for private land to be retained and developed if zoning requirements are met. No hard-surfaced roads connect the communities either to each other or to the mainland of Long Island. They are accessible mainly by passenger ferry or private boat. Vehicle use is restricted within the boundary of the Seashore on Fire Island. Without paved roads and with limited traffic, the communities have retained much of their original character. Some of the communities have hotels or facilities for overnight guests, while others are strictly residential. There are approximately 4,200 developed properties on Fire Island, with approximately 300 residents living on the island year-round. The number of year-round residents has slowly and steadily declined in recent years. Vehicle access is limited for year-round residents, contractors and other service providers (telephone, fuel, garbage, etc.), as all vehicles crossing federal lands must have a National Park Service driving permit.

During the summer season, the population of Fire Island swells to approximately 30,000, with a total two to three million visitors each year. Recreational visitation to sites and facilities owned or managed by the Seashore in 2012 was 483,000. The Seashore's primary visitor facilities on Fire Island are Fire Island Light, Sailors Haven, Watch Hill, and the Wilderness Visitor Center. Fire Island Light

is maintained and operated by the Fire Island Lighthouse Preservation Society, which offers tours and other visitor programming. Concessioners operate the marina at Sailors Haven, as well as the marina and campground at Watch Hill. The Seashore maintains visitor services facilities at Sailors Haven, Talisman, Watch Hill, and at the eastern end of the Wilderness Area. The Seashore offers two protected 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 park housing. Located at either end of Fire Island and accessible by vehicle are major state and county beaches with sizable visitation.

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 about 15 miles east of Patchogue in the midst of a densely developed residential neighborhood in the village of Mastic Beach.



MAP 1-A VICINITY

PURPOSE OF AND NEED FOR THE GENERAL MANAGEMENT PLAN

A general management plan (GMP) is a comprehensive plan that defines a national park's purpose and management direction and provides the overarching guidance necessary to coordinate all subsequent planning and management. This ensures that national park managers carry out, as effectively and efficiently as possible, the mission of the National Park Service (NPS) as derived from the Organic Act of 1916, which states:

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The GMP for Fire Island takes the long view—15 to 20 years into the future—and is meant to be a policy-level document that provides overarching guidance for Seashore managers. When approved, the Fire Island GMP will serve as the foundation for all subsequent planning and management decisions. All other plans will be based upon the GMP.

The four basic elements required of NPS GMPs (by Public Law 95-625) are:

- Measures for **preservation** of the area's natural and cultural resources.
- Types and general intensities of **development** associated with public enjoyment and use of the area, including general locations, timing of implementation, and costs.
- Identification and implementation commitments for visitor **carrying capacities**.
- Potential **boundary** modifications and the reasons for them.

This GMP has also been developed to meet the requirements of an environmental impact statement (EIS) pursuant to the National Environmental Policy Act of 1969, as amended (NEPA) and its implementing regulations (43 CFR 1500-1508), the Department of the Interior's NEPA regulations (40 CFR Part 46), and the NPS Director's Order #12 – *Conservation Planning, Environmental Impact Analysis, and Decision Making.* Once an alternative is selected as the approved GMP and actions are implemented, additional site-specific compliance may be necessary for some actions and would be undertaken in accordance with all applicable requirements.

Planning Issues

Fire Island National Seashore's last GMP was completed in 1977. Since 1977, the Seashore's resource management responsibilities have evolved, as have the philosophies underlying best management practices. A number of newly introduced mandates, events, and other actions since 1977 affect the management of the Seashore's resources. Likewise, issues related to climate change and sea-level rise, land use and development, shoreline management, and the changing needs and desires for public access and recreational use (e.g., boating, vehicular access) also affect the Seashore's resource management practices.

Since 1977, a number of new management conditions and challenges have emerged:

- Seven miles of the barrier island became federally designated wilderness;
- Five federally listed threatened and endangered species have been identified;
- Vector-borne diseases like Lyme disease and West Nile Virus have emerged as resource management issues;
- The Seashore assumed responsibility for the management of two major cultural resource areas, Fire Island Light on the west end of the island and the 613-acre William Floyd Estate on Long Island; and
- Subsequent cultural resource studies have deepened our understanding of the full extent of cultural resources represented across Fire Island.

A Wilderness Management Plan was approved in 1983. As part of the current GMP/EIS planning process, proposals for the Fire Island Wilderness are described in the Common to Action Alternatives section of Chapter Two and evaluated in Chapter Four. The Wilderness Management Plan, now referred to as a Wilderness Stewardship Plan (WSP), was updated to be consistent with the proposals in the GMP/EIS. The WSP is being made available for review concurrent with the draft GMP/EIS and appears in Appendix D.

Through the project scoping phase of the GMP/EIS process, the planning team has identified the following list of planning issues:

▸ ACKNOWLEDGING THE DYNAMIC CHARACTER OF THE BARRIER ISLAND AND ADDRESSING CLIMATE CHANGE AND SEA-LEVEL RISE

Fire Island is constantly being shaped and re-shaped by wind and waves. The complex interaction of sediment, waves, and currents results in a dynamic landscape, with formations like beaches, dunes, and spits that shift overtime. Both natural factors and human activities affect the dynamic character of the barrier island. Natural drivers of coastal change include but are not limited to periodic storms and floods, climate change, and sea-level rise. Human activities, such as continued development and efforts to protect existing development, also influence the geomorphology of Fire Island.

Climate change refers to any substantial changes in average climatic conditions (such as average temperature, precipitation, or wind) or climatic variability (such as seasonality or storm frequencies) lasting for an extended period of time (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change (IPCC 2007) provide clear evidence that climate change is occurring and will accelerate in the coming decades. The effects of climate change on national parks are beginning to emerge as both science and impacts become clearer; however, it is difficult to predict the full extent of the changes that are expected under an altered climate regime.

Climate change will result in significant effects on conditions at the park, including impacts from sea-level rise and potentially destructive storm events. More detailed examination of these effects will be critical as actions envisioned in the approved GMP are analyzed and implemented at site-specific levels. Factoring in sea-level rise, these analyses will influence the type, design, location, and ultimate feasibility of park facilities and developments.

▸ RECOGNIZING A COMPLEX MOSAIC OF JURISDICTIONS

The Seashore is made up of approximately 19,580 acres of land and water. Of that only 32 percent is under federal ownership. The rest of the land and water within the Seashore's boundary is made up of privately owned and developed properties, Smith Point County Park (owned and managed by Suffolk County), and town and village marinas and beaches owned and managed by the towns of Brookhaven and Islip and the villages of Bellport, Ocean Beach, and Saltaire. On the western end of Fire Island Robert Moses State Park abuts the Seashore.

As previously stated, interspersed within the Seashore are 17 diverse residential communities that were established before the Seashore's authorization. Unique to Fire Island's legislation, private land can be retained and developed if federal zoning requirements are met. No hard-surfaced roads connect the communities, and they are accessed mainly by ferry or private boat. Without paved roads and with limited traffic, the communities have retained much of their original character.

FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN

MAP 1-B JURISDICTIONS

The National Park Service (NPS) has jurisdiction over all activities in the surface and water column within the park's boundaries, regardless of land ownership (36 CFR Part 1.2). Per Public Law 88-587, the Act that established the Fire Island National Seashore (FINS), "The boundaries of the national seashore shall extend from the easterly boundary of Robert Moses State Park eastward to Moriches Inlet and shall include…islands and marshlands in the Great South Bay…and, in addition, the waters surrounding said area to distances of one thousand feet in the Atlantic Ocean and up to four thousand feet in Great South Bay and Moriches Bay…"

36 CFR Part 28 - Zoning Standards for FINS provides NPS oversight of all zoning and development, private and public, within the boundaries of Fire Island National Seashore.

The towns of Islip and Brookhaven own the bay bottom lands within their boundaries, with the exception of specific small, individually owned lots and private marinas, located at Cherry Grove, Ocean Bay Park and Fire Island Pines, Blue Points bottom lands, and four NPS parcels. Incorporated villages of Saltaire and Ocean Beach also have jurisdiction within the bay bottom lands within their boundaries. The incorporated village of Bellport owns Bellport Beach on Fire Island.

Towns have jurisdiction over all bay lands within their boundaries regardless of ownership, as does NYS-DEC.

Underwater land owned by NPS occurs 4 places in the bay:

1. Fire Island Light Station Tract
2. Two lots at east side of Clam Pond (Saltaire)
3. Sailors Haven Marina, extending out into the bay
4. Watch Hill Marina

New York State holds title to the Atlantic Ocean within the park boundary, but has granted full use and occupancy rights and ceded concurrent jurisdiction to NPS along the ocean for the entire lenth of the park boundary, extending out (south)1,000 feet from MHW.

Federal Land
Underwater Federal Land
Fire Island Wilderness
The Nature Conservancy Bluepoints Bottom Land
Non-Federal Public Land
National Wildlife Refuge
Town of Brookhaven
Town of Islip
Town of Babylon
Incorporated Villages
Town Boundaries
Ferry Route
Fire Island National Seashore Boundary

North
0 1 2 Miles

Regulatory oversight for land use and development, water, sanitation, wildlife, coastal zone management, driving, and public health and safety is distributed across multiple jurisdictions within the Seashore boundary, including two incorporated villages (Saltaire, Ocean Beach), two Long Island-based municipalities (Brookhaven, Islip), Suffolk County, and multiple NY State agencies. These agencies have missions, mandates, and policies that frequently conflict with those of the NPS. As a result, the practical application of the NPS' Management Policies to non-federal properties within the Seashore boundary has presented challenges. The public often incorrectly believes and expects that the NPS has the authority to transcend these circumstances to effectively address a myriad of issues.

Federal zoning standards developed by the NPS and approved by the Secretary of the Interior have been incorporated (for the most part) into town and village zoning codes to regulate land use and development within the residential communities. The concept of employing the Secretary's zoning standards to address land use and development on private lands within the park was originally based on the "Cape Cod Formula" applied at Cape Cod National Seashore. While the Cape Cod Formula has met with relative success in Massachusetts, it has not translated into success on Fire Island. The practice of granting variances is widespread, even when NPS has noted its objection and indicated that the property would lose its suspension from the condemnation authority of the Secretary of the Interior. The towns and villages grant variances based on precedent making it very difficult to deny subsequent applications. Further, NPS has neither the financial resources nor the political support to engage in condemnation of these properties. As a result the federal zoning in its current application has not been a particularly powerful tool for controlling development on Fire Island.

The mosaic of public and private entities, each with its own purposes, policies, guidelines, and management approaches, has resulted in confusion and frequent conflicts for management of Fire Island. No existing mechanism effectively enables planning, communication, and cooperation across those varying entities. A new management paradigm is needed to make the Island "whole" and to foster cooperative stewardship in the management of Fire Island.

▸ REINTERPRETING ISLAND RESOURCES

Since its establishment in 1964, the Seashore has been recognized almost exclusively for its natural resource values. The Seashore's 1977 GMP identified the "primary management concern" as being "preservation and enhancement of the serenity and natural beauty of the Island, which includes the protection of the beaches, dunes, and other natural features fundamental to the concept of Fire Island National Seashore." Since 1977, additional research has been completed on the historic resources of Fire Island, including a Historic Resource Study (1979), Archeological Overview and Assessment (2005), and an Ethnographic Overview and Assessment (2006).

These reports reveal a rich cultural heritage, with some communities and institutions (e.g., U.S. Life-Saving Service) having their roots on Fire Island in the mid-19th century. Prior to its inception as a resort area in the 1880s, Fire Island had been put to agricultural and industrial use for generations. While the significance of the natural resource values of Fire Island is not in dispute, it is important to recognize that Fire Island is a cultural landscape that has been and continues to be shaped both by human intervention and the forces of nature.

Failing to recognize the importance of this interrelationship between the human and natural dimensions of Fire Island has produced policies and management strategies that have been difficult to advance.

▸ PLACING NEW EMPHASIS ON MARINE AND OCEAN-BASED RESOURCES

In the past, management of the Seashore—as with other coastal national parks and seashores—has focused more on terrestrial than on aquatic resources. Yet Fire Island's boundaries extend 4,000 feet on average into the Great South Bay, and 1,000 feet into the Atlantic Ocean, encompassing a wealth of submerged and tidal resources, both natural and cultural. Over 70 percent of the Seashore is submerged. In recent years Seashore officials have become increasingly concerned about the protection of these marine resources. At the same time, the NPS has been affirming its commitment to marine resource protection service-wide, through development of new plans and initiatives.

▸ BROADENING THE PARK'S VISITATION

The Seashore offers a wide range of recreational activities and facilities to the visiting public. In 2012 the park's recreational visitation was approximately 483,000. However, the economic, ethnic, and geographic diversity of the Seashore's audience has remained limited, particularly compared with the demographics of the nearby metropolitan New York region. Some Seashore areas are heavily used, with little visitor infrastructure. Other facilities could handle increased public use. Opportunities to expand outreach and accessibility, strategies for broadening the Seashore's audiences, and measures to ensure that the Seashore's resources and stories are relevant to current and future generations of Americans must be considered.

▸ ADDRESSING AGING INFRASTRUCTURE

The Seashore's physical infrastructure is complex and serves visitors and staff at several locations on Fire Island and Long Island. The Seashore maintains over 10 miles of boardwalk and operates over 90 buildings, including the historic William Floyd Estate and the Fire Island Light Station. Many of the Seashore's visitor facilities and supporting infrastructure are over 25 years old and are located on Fire Island, making them vulnerable to severe weather and storms and difficult to operate and maintain. Because of the linear character of Fire Island and reliance on water-based transportation, the Seashore's visitor facilities are hard to reach for both the visiting public and the facilities management staff. Similar issues are associated with Seashore staff housing on Fire Island. On Long Island, the Seashore's headquarters and the Patchogue Maintenance Facility are located just under one-half mile apart.

▸ THE WILLIAM FLOYD ESTATE

The William Floyd Estate (the Estate) encompasses the remaining 613 acres of the original "plantation" operated by William Floyd, who signed the Declaration of Independence as a representative of New York. In 1965 Floyd family descendants donated the Estate, composed of 27 buildings, structures, and major landscape features as well as thousands of personal effects and historical artifacts, to the NPS. The NPS assumed responsibility for the main house (Old Mastic House) in 1975, but did not acquire full management responsibility for the entire property until 1991. The Estate is located on Long Island adjacent to the village of Mastic Beach and is different in purpose and character from the larger portion of the Seashore on Fire Island. The 1978 Development Concept Plan – Interpretive Prospectus provided the primary guidance for management of the Estate. Throughout its NPS administrative history, the Estate's preservation and programming have been subject to funding shortfalls and staffing limitations. The maintenance function at the Estate is spread across a number of small sheds near the existing curatorial storage building. Maintenance projects requiring indoor space must be transported and completed at the Patchogue Maintenance Facility 15 miles to the west. This maintenance facility also serves the east end of Fire Island. Management options for the Estate aimed at improving the outlook for its long-term preservation and interpretation must be considered.

THE FOUNDATION FOR PLANNING & MANAGEMENT

The foundation for planning and management is a formal statement of a park's core mission and provides basic guidance for all the decisions to be made about a park. It describes the core mission and underpinnings of a park unit by identifying its purpose, significance, fundamental resources and values, interpretive themes, special mandates, and administrative commitments. The process of preparing a foundation document aids park managers, staff, and the public in identifying and clearly stating the essential information that is necessary for park management to consider when determining future planning efforts, outlining key planning issues, and protecting resources and values that are integral to park purpose and identity.

The Seashore's foundation for planning and management was developed with substantial stakeholder input during the course of three separate workshops. The contents of the foundation for planning and management were made available to the public for comment in GMP Newsletters 1 (2008) and 2 (2010).

Park Purpose and Significance of Fire Island National Seashore

The purpose and significance statements form the basis for the GMP. In addition, the National Park Service Organic Act of 1916 states the fundamental purpose of each unit in the National Park System is:

. . . to conserve the scenery and the natural and historical objects and the wild life therein and to provide for the enjoyment of the same in such a manner as to leave them unimpaired for the enjoyment of future generations.

The purpose statement identifies the specific reason(s) for establishment of a particular park. The purpose statement for Fire Island National Seashore was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The park was established when the enabling legislation adopted by Congress was signed into law on September 11, 1964 (See Appendix A for enabling legislation and subsequent amendments). The purpose statement lays the foundation for understanding what is most important about the park.

Significance statements express why a park's resources and values are important enough to merit designation as a unit of the national park system. These statements are linked to the purpose of Fire Island National Seashore, and are supported by data, research, and consensus. Statements of significance describe the distinctive nature of the park and why an area is important within a global, national, regional, and system wide context. They focus on the most important resources and values that will assist in park planning and management.

▸ PURPOSE

Together with the Fire Island communities, government agencies, and other partners, Fire Island National Seashore conserves, preserves, and protects for the use and appreciation of current and future generations Fire Island's larger landscape including its relatively undeveloped beaches, dunes, and other natural features and processes and its 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.

Fire Island National Seashore 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.

Fire Island National 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 dynamic barrier island system within close proximity to the largest concentration of population of any national seashore in the United States.

The 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 a distinctive relationship between the built and natural environments.

Fire Island's old growth maritime forest ecosystem running from Davis Park to Point of Woods as exemplified by Sunken Forest, just west of Sailors Haven, is globally rare. This 250 – 300 year old American holly-shadblow-sassafras maritime forest is one of only two such forests known in the world.

Fire Island National Seashore provides important habitat for marine and terrestrial plants and animals, including a number of rare, threatened, and endangered

species. Additionally, it is an important part of the Atlantic flyway and provides shelter for more than 330 migratory, over-wintering, and resident bird species.

The Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness), the only federally designated wilderness in New York State, offers a rare opportunity for a broad spectrum of the American public to experience wilderness.

Continuously 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. The family's multigenerational tenure on the property not only tells their story but also reflects the dynamic social, economic, and political changes that took place over time on Long Island and throughout the nation.

Since 1826, Fire Island has served as a location for aids to navigation for ocean going vessels. The current Fire Island Light was constructed in 1850 and has served as a critical navigation aid for the port of New York for more than 150 years.

Interpretive Themes

Interpretive themes are an organizational tool that reveal and clarify meaning, concepts, contexts, and values represented by park resources. Sound themes are accurate and reflect current scholarship and science. They encourage exploration of the context in which events or natural processes occurred and the effects of those events and processes. Interpretive themes go beyond a mere description of the event or process to foster multiple opportunities to experience and consider the park and its resources. These themes help explain why a park story is relevant to people who may otherwise be unaware of connections they have to an event, time, or place associated with the park.

The following interpretive themes have been identified for Fire Island National Seashore:

Nature's Rhythms of Change and Renewal

Fire Island is constantly changing and always on the move. The very existence of this barrier island, the plant and animal communities that it supports, as well as human engagement in this landscape, is dependent upon nature's rhythms of change and renewal.

Island Resources from Ocean to Bay

From the pounding surf of the ocean, to the swift flow of inlets, to the relative calm of the bay, Fire Island encompasses a myriad of marine and upland environments that support a diverse assemblage of species and provides opportunities for maritime recreation and livelihood.

Fire Island: A Story of People and Place

For centuries, people have been and will continue to be intertwined with Fire Island's delicate environment; actions today will shape Fire Island and its surroundings into the future, challenging all to become stewards of Fire Island's natural and cultural legacy.

Three Centuries of Change at the Floyd Estate

The Floyd family's personal stories and 250-year residency at the Floyd Estate in Mastic Beach provide a lens through which to understand the dynamic social, economic, and political changes that took place over that time on Long Island and throughout the nation.

The Life and Times of a Patriot

As a signer of the Declaration of Independence, William Floyd, prominent New York political leader and wealthy plantation owner, provides a personal perspective on the risks to life, property, and reputation associated with being a patriot in New York during the War for Independence.

Analysis of Fundamental Resources and Values

The NPS works to ensure the conservation and public enjoyment of resources and values fundamental to achieving a park's purpose and maintaining its significance. Deterioration of these qualities would jeopardize a park's purpose or significance. A park may possess other resources and values that are important but not fundamental. Identifying fundamental resources and values is intended to help focus planning and management on what is truly important about a park.

Fundamental resources and values include:

A Shared Resource

Within the boundary of Fire Island National Seashore there are 17 pre-existing, residential communities including two incorporated villages, a county park, and town and village-owned and operated beaches. Immediately adjoining the Seashore to its west is Robert Moses State Park. Collectively, these places offer a variety of experiences to a large and diverse audience and are responsible for the long-term management and protection of Fire Island's natural and cultural resources. In addition, the presence of the residential communities makes evident the rich cultural heritage of Fire Island,

and their varying character contributes to the visitor experience as the Seashore. The interrelationship among the public and private interests as they influence or affect this landscape is a fundamental value of Fire Island National Seashore.

Barrier Island/Coastal Processes

Fire Island is made up of sediment deposited during the last ice age. Wind, waves, and currents have moved and continue to move sediment along and across Fire Island, shifting its position over time. The availability of sediment has not been constant and Fire Island has progressed through periods of sediment accumulation and loss. Increases in the rates of sea-level rise as well as the frequency of storms could influence the rate and scope of change on the barrier island.

Dynamic Natural Systems (Terrestrial Habitats and the Marine Environment)

Fire Island is composed of a variety of terrestrial and marine habitats with particular distinctive qualities and characteristics. From ocean to bay, they include a segment of the Atlantic Ocean, near-shore environment, open beach, the primary dunes, the mid-island swale, the secondary dune (only in a few locations on Fire Island), maritime forest, fresh water bogs, and saltmarshes and submerged aquatic vegetation in the bay, and a segment of the Great South Bay. Fire Island supports several federally listed and state listed threatened and endangered species.

Cultural Resources

Fire Island has a rich cultural history with some communities and institutions (e.g., U.S. Lifesaving Service) having their roots on the island in the mid-19th century. Prior to its inception as a resort area in the 1880s, Fire Island had been put to agricultural and industrial use for generations. Fire Island represents a cultural landscape that has been shaped both by human intervention and the forces of nature. The Fire Island Light Station was first developed in 1826 and since that time has facilitated communication and navigation for mariners. On Long Island, the William Floyd Estate was home to one of New York's signers of the Declaration of Independence and generations of his descendants. The cultural resources of Fire Island and the William Floyd Estate enable the public to understand and appreciate the history and development of these areas in the larger context of the region and in response to changing social, economic, cultural and political conditions.

Fire Island Wilderness

The Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness) is the only federally designated wilderness area in the State of New York and occurs in the single largest metropolitan area in the United States. At 1,380 acres, it is also one of the smallest wilderness areas managed by the NPS. Due to its small scale and proximity to large urban populations, it offers the unique opportunity to introduce the concept and experience of Wilderness to a large population of potential users. The Fire Island Wilderness also encompasses cultural remnants that reflect the historic human activity that preceded the park's creation and wilderness designation.

Seashore Experience

Fire Island National Seashore offers a wide range of experiences within a coastal environment to a large and diverse urban population in one of the most populous regions of the United States. Millions of people live within a day's travel of the Seashore and can experience a range of opportunities from solitude and communion with nature to more active recreation and social interaction. Individuals participate in all forms of recreation, from completely unstructured activities to formal programs and events. People who come to Fire Island have the opportunity to enjoy a relatively car-free environment – an increasingly rare experience in the Northeast. The Seashore experience may further be complemented by Fire Island's residential communities some of which function as gateways to the Seashore and all of which exhibit distinctive and varying community character.

The following fundamental resource and values analysis was developed during the Seashore's GMP process and reflects the input of the planning team, key stakeholders, and other NPS resource management professionals. The analysis describes their condition, and lists the stakeholders in their preservation and management.

A SHARED RESOURCE

Description & Importance

Only 32 percent of the 19,580 acres located within the Seashore's boundary is under federal ownership. Within the boundary of Fire Island National Seashore there are 17 preexisting residential communities including the villages of Ocean Beach and Saltaire, Smith Point County Park, and town- and village-owned and operated beaches. Immediately adjoining the Seashore to its west is Robert Moses State Park. Collectively, these places offer a variety of experiences to a large and diverse audience. Along with the NPS, the Fire Island communities, New York State, Suffolk County, the towns of Islip and Brookhaven, and the village of Bellport are engaged in the care and management of Fire Island's natural and cultural resources. In addition, the presence of residential communities makes evident the rich cultural heritage of Fire Island, and their varying character contributes to the visitor experience at the Seashore.

Just as the management actions and approaches of these entities may have an impact on federal lands, the management actions and approaches of Fire Island National Seashore may likewise have an impact. The interrelationship among these public and private interests as they influence or affect this landscape is a fundamental value of Fire Island National Seashore. Fire Island is a shared resource.

Current Conditions, Trends, & Threats

The confluence of a number of factors has produced a fractured approach to resource management that is often a source of conflict and fails to protect the common natural, cultural, and aesthetic values of Fire Island.

- The NPS does not and cannot independently manage the resources of Fire Island. Regulatory oversight for land use and development, water, wildlife, sanitation, coastal zone management, driving, and public health and safety is distributed across a number of jurisdictions within the park boundary including two incorporated villages (Saltaire, Ocean Beach), two Long Island-based municipalities (Brookhaven, Islip), Suffolk County, and multiple NY State agencies. However, there is no formal structure or clear authorities that ensure effective communication, collaboration, or cooperation among these regulatory and management entities.
- On Fire Island, interspersed among the federal tracts within the Seashore, are 17 residential communities (including the villages of Ocean Beach and Saltaire) that were established before the Seashore's authorization. Under the Seashore's enabling legislation, private lands may be retained and developed if federal zoning requirements are met. There are approximately 4,200 developed properties on Fire Island.
- Without paved roads and with limited vehicular traffic, the Fire Island communities have retained much of their original character. A community character analysis undertaken by the Seashore with the National Parks & Conservation Association (NPCA) in 2009 revealed that the four most important elements defining community character were actually based on how Fire Island is experienced. They included a sense of communion with both nature and community (represented by a group gathering to view the sunset); a sense of arrival (represented by passengers disembarking the ferry); a sense of self-reliance (represented by the collection of hand carts at the ferry dock); and a vehicle-free existence (represented by pedestrians on a boardwalk). The study findings also provided some insights into common values associated with the built environment, including building scale, materials, color, fencing, pathways, and landscape features.

- Federal zoning standards developed by the Seashore and approved by the Secretary of the Interior have been incorporated (for the most part) into the town and village zoning codes. The underlying purpose of the existing federal zoning standards is to protect Fire Island's natural resources. The practice of granting variances even in cases where NPS has noted its objection and indicated that the property would lose its suspension from the Secretary's authority to condemn noncompliant properties is widespread. The towns and villages often grant variances based on precedent, making it very difficult to deny subsequent applications. Further, NPS has neither the financial resources nor the political will to engage in condemnation of these properties. However, given the shortcomings of the federal zoning standards to prevent inappropriate developments, NPS is reevaluating the standards, while working with the local zoning authorities to move towards more compliance with NPS laws and policies.
- Over the course of decades, the U.S. Army Corps of Engineers (USACE) has been working with New York State (NYS), the Department of the Interior (DOI) and local authorities to develop a storm protection plan for Fire Island addressing, the area from Fire Island Inlet in the west to Montauk Point in the east; hence this effort is often referred to as FIMP. In 2011, the NPS, the U.S. Fish and Wildlife Service (FWS), and the USACE developed a conceptual plan referred to as the Tentative Federally Supported Plan (TFSP). In the wake of Hurricane Sandy, FIMP, as described in the TFSP, has received federal funding to move forward.
- In accordance with NYS' Coastal Erosion Hazard Act, a coastal erosion hazard area (CEHA) has been identified on Fire Island. The CEHA is meant to be a tool to control development on and in front of the primary dune to preserve this primary protective feature of the barrier island from coastal storms and tidal surges. On some parts of Fire Island, the state retains responsibility for enforcing CEHA; on others the state has ceded this authority to the town. Regardless of who is responsible, enforcement of CEHA has been inconsistent at best, and nonexistent at worst.
- In addition, a full complement of cultural resources including historic structures, landscape features, archeological resources, ethnographic resources, and collections may be found on the non-federal lands within the Seashore. Existing documentation points to many resources that are known to occur on non-federal lands that contribute to Fire Island's historic and cultural heritage. These resources are known to few, and their long-term protection is uncertain.
- While the NPS has authority to take steps to protect Seashore resources on federal lands within the Seashore boundary, that authority is limited on non-federal lands and, in practice, has presented problems due to conflicting missions and objectives and a lack of clarity regarding resource management responsibilities among the different landowners and regulatory authorities.

Desired Condition

The NPS partners with the public, Fire Island communities, state and local government, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.

The NPS provides for the stewardship of the coastal environment and its cultural and natural systems, while recognizing that Fire Island is part of a larger ecological, social, economic, and cultural context.

Through outreach and education, the NPS fosters public understanding and appreciation of the purpose and significance of the national seashore and its natural and cultural resources, as well as the public's vital stewardship role in protecting Fire Island.

The NPS partners with others to ensure that land use development practices undertaken on Fire Island promote ecological health and environmental quality in this dynamic environment and acknowledge and respect the community character and the continued presence of Fire Island communities.

Stakeholder Interests

Stakeholder interests are articulated under "Current Conditions, Trends, & Threats." The primary stakeholders are entities having direct ownership or management responsibilities for lands within the Seashore including residential communities including the villages of Ocean Beach and Saltaire, the village of Bellport, the towns of Brookhaven and Islip, Suffolk County, and the State of New York.

With regard to cultural resources, there are few groups taking an interest in the historic resources or the cultural heritage of Fire Island as a whole. On non-federal lands, there are a small number of local historical societies that maintain artifacts and archives associated with Fire Island communities – Cherry Grove, Ocean Beach, and Point o' Woods all have such collections. Entities committed to recognizing the architectural heritage of Fire Island are less evident.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of coastal, cultural, natural, and ocean resources are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

BARRIER ISLAND AND COASTAL PROCESSES

Description & Importance

Fire Island's shoreline is constantly being shaped by wind and water, including longshore current, offshore currents, inlet formation, tidal delta growth, and occasional overwashing, which are all natural processes that contribute to and sustain barrier islands.

Barrier islands provide some protection to the mainland coast from the direct impact of storm waves.

Additionally, the barrier island provides a diverse assemblage of terrestrial and marine habitat.

The barrier island environment protects the mainland from storm events and wave action while providing a vital ecosystem that supports a diversity of species.

Current Conditions, Trends, & Threats

Fire Island is made up of sediment deposited during the last ice age. Wind, waves, and currents have moved and continue to move sediment along and across Fire Island, shifting its position and shape over time. The availability of sediment has not been constant, however, and Fire Island has progressed through periods of sediment accumulation and loss. Storms also shape Fire Island, causing overwashing and breaching, which carry sediment to the island interior and bay shoreline. Breaches and inlets are natural features in the barrier island landscape that have come and gone over time, opening with powerful storms and gradually closing as sand is moved along the coast.

Numerous studies have documented a deficit in the sediment budget for Fire Island. Sediment deficits are greatest along the eastern portion of the island, but appear to be augmented by offshore deposits on the inner continental shelf along the central and western segments of the island. Sea-level rise and a general negative sediment budget will result in continued beach erosion and dune displacement, with greater effects likely in the eastern portion of Fire Island.

Increases in the rate of sea-level rise as well as the frequency and intensity of storms could influence the rate and scope of change on the barrier island. A variety of administrative programs are in place to decrease or mitigate damage to coastal features and to encourage the retention and enhancement of the characteristics of the Seashore.

Desired Condition

Development on Fire Island is undertaken in a manner that conserves natural resources and the character of the island to greatest degree possible. Dynamic natural processes are allowed to proceed unimpeded by human intervention wherever feasible, and re-established where possible.

The NPS partners with the public, Fire Island communities, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.

Stakeholder Interests

Stakeholder interests relative to the natural systems found on Fire Island vary. While there is broad acceptance and support for the notion that the coastal environment is dynamic, there are differing opinions on what the response to those changes should or could be.

NPS management policies direct parks to allow natural processes to unfold unimpeded by human intervention. Many stakeholder interests, particularly environmental conservation organizations, support NPS management policies. However, others are concerned that unimpeded natural processes would have a negative impact on their properties and the quality of their experience and believe that the system should be managed accordingly. Navigating these varying and often competing stakeholder interests has presented a major management issue for the NPS.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of coastal, natural and ocean resources are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

DYNAMIC NATURAL SYSTEMS (TERRESTRIAL HABITATS & THE MARINE ENVIRONMENT)

Description & Importance

Fire Island is composed of a variety of terrestrial and marine habitats with particular distinctive qualities and characteristics. From ocean to bay, they include a segment of the Atlantic Ocean, open beach and near-shore environment, the primary dunes, the mid-island swale, the secondary dune (only in a few locations on Fire Island), maritime forest, fresh water bogs and saltmarshes, and submerged aquatic vegetation in the bay and a segment of the Great South Bay.

The Seashore's boundary extends up to 4,000 feet on average into the bay (or farther, depending on bay island locations within the boundary) and 1,000 feet into the ocean. As a result approximately 14,600 acres or 75 percent of lands within the Seashore's boundary are submerged. The marine resources within the Seashore's boundary are functionally part of a much larger estuarine and oceanic system and contribute in different ways to those larger systems.

The marine environment is host to ocean and estuarine-dwelling flora (algae, sea grass) and fauna (crustaceans, mollusks, and other invertebrates; birds, fish, turtles, seals, whales), and is a prime nursery and feeding location for finfish, crabs, horseshoe crabs, and migrating birds, to name a few species that rely specifically on this dynamic coastline.

The flora and fauna found on Fire Island can be very specific to these habitats or micro-environments. For example, the Sunken Forest, an old-growth maritime forest comprised mainly of American holly, sassafras, and shadbush, is a globally rare forest habitat. The valuable seagrass beds, lying submerged in the shallow bays off the back salt marshes, are critical habitats for a variety of shellfish, fish and crabs.

Fire Island supports several federally listed and state-listed threatened and endangered species, some of which are Piping Plover (*Charadrius melodus*), roseate tern (*Sterna dougallii*), least tern (*Sternula antillarum*), common tern (*Sterna hirundo*), seabeach amaranth (*Amaranthus pumillus*), and seabeach knotweed (*Polygonum glaucum*). The barrier beach provides feeding and nesting habitats for many species of migrating birds, insects, turtles, and marine mammals.

Current Conditions, Trends, & Threats

The waters of the Great South Bay and the Atlantic Ocean within the Seashore's boundary provide excellent bay and barrier beach fish habitat. These waters host diverse fish populations that show pronounced seasonal changes.

The state of the Atlantic **near-shore ecological environment** is generally unknown. This submerged area requires additional study, particularly regarding the fish and benthic communities. Issues and concerns include potential septic and groundwater leachate carrying nutrients and pathogens, overfishing, and mining sand from off shore sources.

The **beaches and dunes** are highly dynamic shoreline features with naturally occurring cycles of erosion and accretion. Adjacent to the developed areas, the natural growth and migration of the beaches and dunes is more likely to be inhibited by shoreline development. Threatened and endangered species (e.g., Piping Plovers, seabeach amaranth) are less abundant on the beach fronting the developed areas on Fire Island than they are on the beach in undeveloped areas. The continued existence of groins in the west end presents a challenge, in that they inhibit the transport of sand along the beach and possibly other natural processes, yet also serve to protect the integrity of the village of Ocean Beach's public well.

The **mid-island habitats** extend from the leeward or north side of the dunes to the marsh or bay shore and include grasslands, shrub thickets, maritime forests, and freshwater wetlands. This area provides habitat for native flora and fauna. In undeveloped areas, conditions are generally considered to be good. Where there is higher-density development, issues and concerns include mosquito control, human-wildlife conflicts (such as artificial feeding of deer and other wildlife, nuisance deer, etc.), septic discharge, manipulation of the vegetation (e.g., landscaping), fencing (channeling wildlife), and non-native invasive species (e.g., bamboo, Phragmites), and trampling (e.g., social trails).

The **saltmarshes** of Fire Island are considered to be in good condition. Some pre-existing mosquito ditching remains in the Wilderness Area but is not maintained. Non-native species (e.g., Phragmites) are also evident. Marshes in the Seashore may be vulnerable to sea-level rise if they are subject to subsidence or are unable to migrate. Sediment delivery to marshes through overwash and breach processes and flood tidal delta formation are critical to the long-term maintenance of Seashore marshes. Issues and concerns include beach stabilization efforts that could impede this sediment delivery.

The **bay shore** includes the bay beaches, marsh edges, and developed shorelines (e.g., bulkheads) and extends into the bay environment of the bay water column, submerged aquatic vegetation, and sand and mud bottoms. Seagrass beds off the Fire Island Wilderness shore and the east end of Fire Island remain as remnant habitat. The Great South Bay waters are known for high concentrations of wintering waterfowl such as Brant (*Branta bernicla*), Canada geese (*Branta canadensis*), American black duck, (*Anas rubripes*), and Bufflehead (*Bucephala albeola*). Water quality has been affected by nutrient loading, resulting in harmful algal blooms. The bay shore is affected by channel dredging, bulk heads and shoreline development that impede sediment transport.

Desired Condition

Dynamic natural processes are allowed to proceed unimpeded by human intervention wherever feasible and restored or emulated where possible.

The Seashore's marine resources are better understood, protected, and contribute to the ecological sustainability of the ocean and bay environments and to the preservation of Fire Island's natural and cultural heritage.

The NPS partners with the public, Fire Island communities, state and local governments, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.

The NPS provides for the stewardship of the coastal environment and its cultural and natural systems, while recognizing that Fire Island is part of a larger ecological, social, economic, and cultural context.

Management decisions about natural and cultural resources are based on scholarly and scientific information, fundamental resources and values, and consultation with appropriate agencies and communities and in consideration of the broader context of the resources and the Seashore.

Stakeholder Interests

There is a strong, broad-based constituency that includes Fire Island property owners, visitors, conservation organizations, historic preservation organizations, state and local governments, recreational interests, law enforcement/ public safety, and economic interests that recognize the value of these resources and advocate for their continued use and protection.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of coastal, natural and ocean resources are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

CULTURAL RESOURCES

Description & Importance

Fire Island has a rich cultural heritage with some communities and institutions (e.g., U.S. Life Saving Service) having their roots on the island in the mid-19th century. Prior to its inception as a resort area in the 1880s, Fire Island had been put to agricultural and industrial use for generations. Fire Island represents a cultural landscape that has been shaped both by human intervention and the forces of nature.

Fire Island's proximity to shipping lanes serving New York harbor made it critical to maritime navigation and communication. A lighthouse has stood on Fire Island since 1826. The lighthouse's function, as a way for ships to communicate and navigate, led to the placement of related facilities, many using more advanced technologies. The existing Fire Island Light was built in 1858 at the western edge of Fire Island, but since that time littoral drift has continued to extend the western edge so that the present-day lighthouse now sits nearly five miles east of the western border at Democrat Point. In 1868, the Western Union Telegraph Company began using the site when it built a signal tower and telegraph station immediately east of the lighthouse. Building yet again on the site's prime location, the federal government expanded its maritime and communication presence by instituting a U.S. Naval Radio Compass Station in 1906, just east of the Light Station and the Western Union Fire Island Marine Station (which was abandoned in 1920 and destroyed by a hurricane in 1938).

On Long Island, adjoining the village of Mastic Beach, the 613-acre William Floyd Estate includes the home occupied by William Floyd and generations of his descendants well into the 20th century. William Floyd was one of New York's signers of the Declaration of Independence. The Estate consists of the Old Mastic house, agricultural outbuildings, family cemetery, and the historic field and forest configuration that has been maintained to preserve its appearance at the time that NPS assumed responsibility for the property.

The Seashore's museum and archival collection is stored across several locations, but the vast majority of the collection is in the Old Mastic House and at the curatorial storage facility at the William Floyd Estate. The Seashore maintains a museum and archival collection of over 100,000 items that pertain to both the William Floyd Estate and Fire Island. The curatorial storage facility in its present configuration is at capacity, with little space to perform conservation or administrative work or research.

The cultural resources of Fire Island and the William Floyd Estate enable the public to understand and appreciate the history and development of these areas in the larger context of the region and in response to changing social, economic, cultural, and political conditions.

Current Conditions, Trends, & Threats

The Fire Island Light Station and the William Floyd Estate both occur on federal lands and are the only historical properties that are actively preserved and interpreted by the Seashore for the visiting public. The Fire Island Light Station is operated and maintained through a cooperating association agreement with the Fire Island Lighthouse Preservation Society (FILPS). FILPS offers visitor programming year-round including an interpretive exhibit, the Fresnel Lens exhibit, and guided tours of the lighthouse. Since 2006, visitation to the Fire Island Lighthouse has ranged from a low of 96,000 in 2011 to a high of nearly 120,000 in 2009. According to the 2011 assessment of the historic structures and landscape features (List of Classified Structures or LCS), most were found to be in good condition, with a notable exception being the foundation of the first Lighthouse, which was found to be in fair condition.

The William Floyd Estate is operated and maintained by NPS staff and is open to the public seasonally. Public programs at the Estate include changing interpretive exhibits, guided house tours, special programs (e.g., music concerts, craft demonstrations), guided grounds tours, and nature walks. Since 2006 visitation has ranged from a low of just under 3,000 in 2010 to a high of nearly 5,600 in 2006. According to the 2011 assessment of historic structures on the Estate, most were found to be in good condition. Several landscape features were considered to be in fair or poor condition including dirt roads and paths that traverse the Lower Acreage, the Lopped Tree lines, the Great Ditch, and the ponds.

The Seashore's collections are considered to be in good condition, though some storage conditions are suboptimal. The curatorial storage facility is at or near capacity and offers only limited workspace for conservation and research needs. Additional inventories must be completed to better assess the state of terrestrial archeological resources, submerged cultural resources, ethnographic resources, and cultural landscapes on the Island and at the William Floyd Estate. Resources on non-federal lands are particularly vulnerable because of limited knowledge and expertise.

Desired Condition

The cultural resource values associated with these federal properties would be completely documented and, wherever possible, preserved for the understanding and appreciation of future generations.

The NPS partners with the public, Fire Island communities, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.

The NPS provides for the stewardship of the coastal environment and its cultural and natural systems, while recognizing that Fire Island is part of a larger ecological, social, economic, and cultural context.

Management decisions about natural and cultural resources are based on scholarly and scientific information, fundamental resources and values, consultation with appropriate agencies and communities, and in consideration of the broader context of the resources and the Seashore.

Stakeholder Interests

Stakeholder interest varies per site. Fire Island Light has the strongest stakeholder representation with the Fire Island Lighthouse Preservation Society, which is dedicated to preserving and interpreting the Lighthouse. This group has devoted a significant number of volunteer hours to preservation and interpretation and has spearheaded several capital campaigns – the most recent of which resulted in the construction of an exhibit building to accommodate the return of the site's original Fresnel lens.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of coastal, cultural, natural, and ocean resources are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

FIRE ISLAND WILDERNESS

Description & Importance

The Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness) is the only federally designated wilderness area in the State of New York and occurs in the single largest metropolitan area in the United States. At 1,380 acres, it is also one of the smallest wilderness areas managed by the NPS. Due to its small scale and proximity to large urban populations, it offers the unique opportunity to introduce the concept and experience of Wilderness to a large population of potential users. The Fire Island Wilderness also encompasses cultural remnants that reflect the historic human activity that preceded the park's creation and wilderness designation.

The Fire Island Wilderness, located east of Watch Hill extends eastward to the western boundary of Smith Point County Park. An ocean-to-bay parcel of non-federally owned land, Bellport Beach, lies roughly in the middle of the Fire Island Wilderness. Bellport Beach separates the Wilderness into an Eastern and a Western segment. The Fire Island Wilderness can be reached from Watch Hill (which is accessible seasonally by ferry or private boat) or by the Wilderness Visitor Center (located adjacent to Smith Point County Park which is accessible year round by car or bus).

Current Conditions, Trends, & Threats

The Fire Island Wilderness can be described within the context of these wilderness character qualities: 1) untrammeled, 2) natural, 3) undeveloped, 4) offers opportunities for solitude or a primitive and unconfined type of recreation, and 5) contains unique features.

Untrammeled: wilderness is essentially unhindered and free from modern human control or manipulation.

The Fire Island Wilderness is relatively untrammeled, with the exception of a small number of management actions taken to eradicate invasive plant species and assess the long-term impacts of deer browsing. Invasive plant species are annually monitored and controlled by appropriate means. Although this management action causes manipulation of the area, it increases the natural wilderness character quality by allowing native plants and processes to re-establish.

Natural: wilderness ecological systems are substantially free from the direct effect of modern civilization.

The natural character of the Fire Island Wilderness is typical of Atlantic barrier islands, which grade from a primary dune along the ocean to salt marsh along the bay. The southern boundary of the Wilderness, located at the toe of the primary dune, is constantly changing due to the dynamic nature of the barrier island system. The development of vegetation is affected by several environmental factors such as wind, salt spray, erosion and overwash. These naturally dynamic processes occur constantly in the Fire Island Wilderness. In some locations, remnants of historic features are evident but do not appreciably interfere with the experience of the Fire Island Wilderness' natural character.

Undeveloped: wilderness is essentially without permanent improvements or modern human occupation.

Currently the Fire Island Wilderness is largely undeveloped although occupied structures and buildings were common throughout the area prior to 1992. Remnants of several of these structures remain.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation: Wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.

The Fire Island Wilderness is within 60 miles of New York City, yet it provides visitors with outstanding opportunities for solitude or a primitive and unconfined type of recreation. Surrounded and buffered by high dunes and salt marsh, one can actually feel far away from civilization. The Fire Island Wilderness has no designated campsites, and backcountry camping follows 'leave no trace' practices. Seashore staff maintains the boardwalks at the Wilderness Visitor Center in addition to portions of the footpath along the Burma Road Trace. These are the designated travel routes within the Fire Island Wilderness but visitors are not restricted to them. The Burma Road Trace is a very dynamic trail and shifts with the moving sand.

Unique Features: Wilderness preserves other features that are of scientific, educational, scenic, or historic value.

Though small in scale, the Fire Island Wilderness is near the largest urban population in the nation, offering substantial opportunities to educate the public about the distinctive qualities of wilderness in general and the Fire Island Wilderness in particular. The unique features of the Fire Island Wilderness-- its size and shape, proximity to urban population, and cultural history-- have great scientific, educational, scenic, and historic value. It is an area where urban populations can study, learn, explore, and admire the natural environment.

Desired Condition

The Fire Island Wilderness is managed to maintain and, where feasible, enhance its wilderness character, including its qualities of being untrammeled, natural and undeveloped, providing opportunities for primitive and unconfined recreation, and its unique features.

Stakeholder Interests

There is broad-based support for the Seashore's management of the Fire Island Wilderness among environmental and recreation interests. A local advocacy group, the Fire Island Wilderness Committee, has been actively engaged in the general management planning process and efforts to develop a new Wilderness Stewardship Plan.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of federally designated wilderness, natural, and cultural resources are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

SEASHORE EXPERIENCE

Description & Importance

The Seashore offers a wide range of experiences within a coastal environment to a large and diverse urban population in one of the most populous regions of the United States. Millions of people live within a day's travel of the Seashore and can experience a range of opportunities from solitude and communion with nature to more active recreation and social interaction. Individuals participate in all forms of recreation, from completely unstructured activities to formal programs and events. People who come to Fire Island have the opportunity to enjoy a relatively car-free environment – an increasingly rare experience in the Northeast. The Seashore experience may further be complemented by Fire Island's residential communities some of which function as gateways to the Seashore and all of which exhibit distinctive and varying community character.

Current Conditions, Trends, & Threats

Total annual visitation to NPS facilities at the Seashore since 2001 has hovered around an average of 646,000 visitors, with a high of 819,000 in 2004 and a low of 483,000 in 2012. Annual visitation to Fire Island as a whole is believed to be considerably higher, with estimates approaching 2.5 million. Visitation to some NPS facilities at Fire Island occurs year round, but much of the activity is seasonal. Annually, visitation peaks during the months of July and August; however, several times since 2001, substantial visitation (> 20,000) occurred up to 10 months out of the year. The shoulder-season months of May and September showed the most consistently high visitation. According to visitor and resident surveys completed in 2008, over 80 percent of Seashore visitors and Fire Island residents originate from the metro New York area and have visited the Seashore on one or more occasions. Information about visiting Fire Island is gleaned most often from previous experience or word of mouth; many visitors also make use of the Seashore's website.

Visitors to the Seashore may engage in a wide range of activities including but not limited to beach combing, boating, swimming, hiking, nature walks, bird watching, touring historic sites, and photography. Volunteerism, stewardship, and citizen science are also activities in which the Seashore's visitors may participate. Bicycling on the federal lands is allowed wherever vehicles are permitted to go, but may be limited or prohibited in some Fire Island communities. Camping is permitted at Watch Hill with a reservation and by permit in the Fire Island Wilderness. Hunting and fishing require state permits and are allowed within the Seashore during specific times of the year. Finally, recreational driving is allowed by permit at the eastern point of access to facilitate hunting, fishing, and other recreational activities, also during specific times of the year.

The economic, ethnic, and geographic diversity of the Seashore's audience has remained limited, particularly given its location in the metropolitan New York region. Visitor use survey respondents at park facilities were overwhelmingly white (97%) and non-Hispanic (95%). This contrasts with 2010 census data for Long Island, which is only 77% white and 84 % non-Hispanic. Water-based access to Fire Island National Seashore can be cost-prohibitive for some families – the round trip ferry fare (including parking) for a family of four can range between $50 to $60 depending on date of travel, point of origin, and destination. Visitors may park for a fee at either Robert Moses State Park on the west end or Smith Point County Park on the east end and enter the Seashore on foot. Daily parking rates range from $8 to $15.

Desired Condition

Through outreach and education, the NPS fosters public understanding and appreciation of the purpose and significance of the Seashore and its natural and cultural resources, as well as the public's vital stewardship role in protecting Fire Island.

The NPS provides a wide variety of quality recreational and interpretive experiences for a broad range of audiences, emphasizing human interactions with the environment and the historical and cultural values of the Seashore.

The NPS preserves the "roadless" character of Fire Island and ensures that water-based transportation is the primary form of access to Fire Island whenever and wherever feasible.

The NPS ensures that the ways to and from NPS facilities on Fire Island and Long Island are well known, well-marked, and easy and safe to navigate.

The NPS enables broad access to Seashore facilities by all members of the public regardless of income or physical ability.

The NPS provides a safe and healthy environment for visitors, residents, and NPS employees, as feasible and appropriate.

Stakeholder Interests

Stakeholder interests range widely and focus on particular activities and facilities. The marinas at Watch Hill and Sailors Haven have regular patrons creating in strong constituencies for these destinations. There are also constituents who have expressed opposition to any further recreational development of Fire Island and to the notion of a bicycle trail extending the length of the island.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of federally designated wilderness, natural, and cultural resources, interpretation and education, and visitor use are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

IMPORTANT RESOURCES & VALUES

CARRINGTON HOUSE & COTTAGE

Description & Importance

The Carrington House and Cottage were listed on the National Register of Historic Places (NRHP) in January 2014. The Carrington House is significant for being owned by Broadway producer Frank Carrington, who hosted a number of stage, screen, and literary celebrities. It is a bungalow-style seasonal residence originally built in 1909 and modified through the years. The cottage was originally part of a life-saving station and was moved to the property in 1947 for use as a guest house. The House and Cottage are managed by the NPS for administrative use and are not open to the public.

Current Conditions, Trends, & Threats

The Carrington House and Cottage are operated and maintained by NPS for administrative purposes. Public access to the property would continue to be limited. In 2012, the Seashore completed rehabilitation work on the exterior of both the House and Cottage consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Desired Condition

The cultural resource values associated with these federal properties would be completely documented and, wherever possible, preserved for the understanding and appreciation of future generations.

The NPS partners with the public, Fire Island communities, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.

The NPS provides for the stewardship of the coastal environment and its cultural and natural systems, while recognizing that Fire Island is part of a larger ecological, social, economic, and cultural context.

Management decisions about natural and cultural resources are based on scholarly and scientific information, fundamental resources and values, consultation with appropriate agencies and communities, and in consideration of the broader context of the resources and the Seashore.

Stakeholder Interests

The Carrington house and cottage have benefitted from the interest of local arts, conservation, and preservation interests.

Relevant Laws & Policies

Pertinent federal laws and policies in effect for the protection of coastal, cultural, natural and ocean resources are described in "Compliance with Federal and State Laws and Regulations" in Chapter 5.

SPECIAL MANDATES AND ADMINISTRATIVE COMMITMENTS

Many of the management decisions for a park unit are directed or influenced by special mandates and administrative commitments with other federal agencies, state and local governments, utility companies, partnering organizations, and other entities. Special mandates are requirements specific to a park that must be fulfilled. Mandates can be expressed in enabling legislation, in separate legislation following the establishment of the park, or through a judicial process. They may expand on park purpose or introduce elements unrelated to the purpose of the park. Administrative commitments are, in general, agreements that have been reached through formal, documented processes, often through memoranda of agreement. Examples include easements, rights-of-way, arrangements for emergency service responses, etc. Special mandates and administrative commitments can support, in many cases, a network of partnerships that help fulfill the objectives of the park and facilitate working relationships with other organizations. They are an essential component of managing and planning for Fire Island National Seashore.

Special Mandates

▸ AN ACT TO ESTABLISH THE FIRE ISLAND NATIONAL SEASHORE AND FOR OTHER PURPOSES

(Public Law 88-587, September 11, 1964), as amended.

Re: Limitations on Powers of Condemnation

Section 2(e)—With one exception the Secretary shall not acquire any privately owned improved property or interests therein within the boundaries of the seashore or any property or interests therein within the communities delineated on the boundary map mentioned in Section 1, except beach or waters and adjoining land within such communities which the Secretary determines are needed for public access to the beach, without the consent of the owners so long as the appropriate local zoning agency shall have in force and applicable to such property a duly adopted, valid, zoning ordinance that is satisfactory to the Secretary. The sole exception to this limitation on the power of the Secretary to condemn improved property where appropriate zoning ordinances exists shall be in the approximately eight-mile area from the easterly boundary of the Brookhaven town park at Davis Park, in the town of Brookhaven, to the westerly boundary of the Smith Point County Park. In this area only, when the Secretary deems it advisable for carrying out the purposes of this Act or to improve the contiguity of the park land and ease its administration, the Secretary may acquire any land or improvements therein by condemnation. In every case in which the Secretary exercises this right of condemnation of improved property the beneficial owner or owners (not being a corporation) of any improved property so condemned, provided he, she, or they held the same or a greater estate in the property on July 1,1963, may elect as a condition of such acquisition by the Secretary any one of the following three alternatives:

1. That the Secretary shall take the said property in fee simple absolute and pay the fair market value thereof as of the date of such taking;
2. that the owner or owners shall retain a life estate in said property, measured on the life of the sole owner or on the life of anyone person among multiple owners (notice of the person so designated to be filed in writing with the Secretary within six months after the taking) or on the life of the survivor in title of any estate held on July 1, 1963. as a tenancy by the entirety. The price in such case shall be diminished

by the actuarial fair market value of the life estate retained, determined on the basis of standard actuarial methods;

3. that the owner or owners shall retain an estate for twenty-five years. The price in this case shall likewise be diminished by the value of the estate retained.

Re: Federal zoning standards:
Section 3(a) In order to carry out the provisions of section 2, the Secretary shall issue regulations, which may be amended from time to time, specifying standards that are consistent with the purposes of this Act for zoning ordinances which must meet his approval.

(b) The standards specified in such regulations shall have the object of (1) prohibiting new commercial or industrial uses, other than commercial or industrial uses which the Secretary considers are consistent with the purpose of this Act, of all property within the national seashore, and (2) promoting the protection and development for purposes of the Act of land within the national seashore by means limitations or restrictions on the size, location, or use of any commercial, residential, and other structures. In accomplishing these objectives, such standards shall seek to reconcile the population density of the Seashore on October 17, 1984, with the protection of the natural resources of the Seashore consistent with the purposes for which it has been established as provided by the Act.

The current federal zoning standards (36 CFR Ch.1 Part 28) appear in Appendix C.

Re: Hunting and Fishing
Section 5 The Secretary shall permit hunting, fishing, and shellfishing on lands and waters under his administrative jurisdiction within the Fire Island National Seashore in accordance with the laws of New York and the United States of America, except that the Secretary may designate zones where, and establish periods when, no hunting shall be permitted for reasons of public safety, administration, or public use and enjoyment. Any regulations of the Secretary under this Section shall be issued after consultation with the Conservation Department of the State of New York.

It is important to note that National Park Service Management Policies (section 4.4.3; 2006) states that commercial fishing may be allowed only if specifically authorized by statute or regulation. The Seashore's enabling legislation does not specifically authorize commercial fin fishing or shell fishing within the park and is thus prohibited.

Re: Sunken Forest Preserve
Section 7(a) The Secretary shall administer and protect the Fire Island National Seashore with the primary aim of conserving the natural resources located there. The area known as the Sunken Forest Preserve shall be preserved from bay to ocean in as nearly its present state as possible, without developing roads therein, but continuing the present access by those trails already existing and limiting new access to similar trails limited in number to those necessary to allow visitors to explore and appreciate this section of the seashore.

Re: Access to area that is now known as the Fire Island Wilderness
Section 7(b) Access to that section of the seashore lying between the easterly boundary of the Brookhaven town park at Davis Park and the westerly boundary of the Smith Point County Park shall be provided by ferries and footpaths only, and no roads shall be constructed in this section except such minimum roads as may be necessary for park maintenance vehicles. No development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the flora and fauna or the physiographic conditions now prevailing, and every effort shall be exerted to maintain and preserve this section of the seashore as well as that set forth in the preceding paragraph in as nearly their present state and condition as possible.

Re: Shoreline Management
Section 8 (a) The authority of the Chief of Engineers, Department of the Army, to undertake or contribute to shore erosion control or beach protection measures on lands within Fire Island National Seashore shall be exercised in accordance with a plan that is mutually acceptable to the Secretary of the Interior and the Secretary of the Army and that is consistent with the purposes of this Act.

(b) The Secretary shall also contribute the necessary land which may be required at any future date for the construction of the new inlet across Fire Island in such location as may be feasible in accordance with plans for such an inlet which are mutually acceptable to the Secretary of the Interior and the Secretary of the Army and that is consistent with the purposes of this Act.

▸ AN ACT TO DESIGNATE CERTAIN LANDS OF THE FIRE ISLAND NATIONAL SEASHORE AS THE "OTIS PIKE FIRE ISLAND HIGH DUNE WILDERNESS," AND FOR OTHER PURPOSES.

(Public Law 96-585, December 23, 1980)

Re: Breach Management

Section (d) Wilderness designation shall not preclude the repair of breaches that occur in the wilderness area, in order to prevent loss of life, flooding, and other severe economic and physical damage to the Great South Bay and surrounding areas.

In addition to special mandates described above, the Code of Federal Regulations (36 CFR) includes special regulations that have been promulgated for Fire Island National Seashore including the zoning standards (noted above) and Special Regulations (36 CFR Ch.1, Section 7.20) which govern the a) Operation of Motor Vehicles, b) Operation of Seaplanes and Amphibious Aircraft, and d) Personal Watercraft.

Administrative Commitments

Fire Island National Seashore manages several facets of its operation through cooperatives agreements and concessions contracts. The Fire Island Light is operated by a cooperator, the Fire Island Lighthouse Preservation Society. Another cooperator, Eastern National, oversees the operation of bookstores at various locations throughout the park. Concessions contracts are in place for public ferry service to Seashore facilities on Fire Island and for the operation of a number of visitor facilities at Sailors Haven and Watch Hill.

RELATED PROGRAMS, PLANS, AND INITIATIVES

▸ FIRE ISLAND INLET TO MONTAUK POINT REFORMULATION STUDY (FIMP)

Fire Island National Seashore was established with a specific directive that erosion control or beach protection measures conducted by the U.S. Army Corps of Engineers (USACE) are required to be "mutually acceptable" to the Secretary of the Interior and the

Secretary of the Army and consistent with purposes of the Seashore's enabling legislation. In 1966, NPS rejected a USACE plan to build stone groins along the length of the Seashore to halt shoreline migration. In 1978, the Council of Environmental Quality (CEQ) concurred with the Department of the Interior (DOI) in rejecting the Environmental Impact Statement (EIS) for the USACE proposal, recommending reformulation of the proposed project for storm protection and beach erosion along the 83-mile stretch of barrier island from Fire Island to Montauk Point (FIMP) and examine impacts on the full system. Since that time (approximately 35 years ago), DOI, NPS, and Fire Island National Seashore have been attempting to achieve a "mutually agreeable" approach to coastal management involving several interim projects in addition to advancing the FIMP Reformulation Study and associated environmental compliance. Through the DOI, NPS staff is working closely with the USACE and NYS staff to develop preferred alternatives that comply with NPS policies, the Seashore's mission, stakeholder concerns, and management priorities.

The USACE is developing the Fire Island Inlet to Montauk Point (FIMP) Reformulation Study to protect areas along the south shore of Long Island with the potential for flooding, erosion, and other storm damage. Specifically, the FIMP Reformulation Study will "identity, evaluate, and recommend long-term solutions for hurricane and storm damage reduction" along the shoreline between Fire Island Inlet and Montauk Point (Corps 2012). The FIMP would take a comprehensive approach to storm management, and would replace the individual storm management regulations and guidance currently in use. The study area encompasses approximately 83 miles of shoreline, including the Seashore. Communities within the floodplain include the Towns of Babylon, Islip, Brookhaven, Southampton, and East Hampton and incorporated villages. This project has the potential to affect geology and coastal processes, water resources, wildlife and wildlife habitat, visitor use and experience, and Seashore operations.

The Tentative Federally Supported Plan (TFSP), accepted in 2011 by the NPS, the U.S. Fish and Wildlife Service (FWS), and the USACE, has been adopted by reference within the context of this draft GMP/EIS plan as basic guidance for shoreline management within Fire Island National Seashore. Should the FIMP Reformulation Study be approved and adopted, its provisions would take precedence over the approved GMP.

▸ GREAT SOUTH BAY HARD CLAM RESTORATION PROJECT

In 2008, the Great South Bay Hard Clam Restoration Working Group was established by Suffolk County to develop a sustainable management plan for the Great South Bay hard clam population (Suffolk County 2011). Fire Island National Seashore was represented on the working group. The goal of the group was to "reestablish and protect populations of hard clams that are necessary to support ecological, economic, cultural, and recreational values associated with restoration of the Great South Bay (Suffolk County 2012)." Based on their research, the working group concluded that the hard clam population is generally low and inconsistently distributed in the Great South Bay. The current population cannot support commercial clamming within the bay. The primary reason for the diminished population is believed to be water quality. The report concluded that "changes in harvest management, increased and improved recreation, and concerted effort to address the environmental factors that are negatively impacting hard clam growth and survival" are necessary to reestablish and protect the hard clam population in the Great South Bay. A significant area of the bay targeted by the Hard Clam Restoration Project falls within the boundary of the Seashore. The NPS continues to be a partner is this effort.

▸ LONG ISLAND REGIONAL COMPREHENSIVE SUSTAINABILITY PLAN 2035

The Long Island Regional Comprehensive Sustainability Plan 2035 was prepared by the Long Island Regional Planning Council. The foundation for the Long Island sustainability planning process was the Long Island 2035 Regional Visioning Initiative funded by the New York Metropolitan Transportation Council (NYMTC), the designated Metropolitan Planning Organization for the region. The purpose of the Regional Visioning Initiative was to help achieve a regional public consensus for where the next generation of Long Islanders could live and work, the transportation systems needed to support these settlements, and the institutional actions required to ensure a prosperous, equitable, and environmentally sustainable Long Island. As stated in the document, the purpose of the plan is "to restore the promise of an affordable, high quality of life for all on Long Island and to position Long Island for the requirements of 21st century communities." The plan addresses tax and governance reform, economic strength, quality of life, and

equitable communities. The implementation of strategies described in the Comprehensive Sustainability Plan is likely to correspond or conflict with goals, objectives, and management strategies proposed in the GMP.

▸ LONG ISLAND INTRACOASTAL WATERWAY FEDERAL NAVIGATION PROJECT

The Rivers and Harbors Act of August 26, 1937 authorized the Long Island Intracoastal Waterway Federal Navigation Project. The existing project provides for a navigation channel 6 feet deep and 100 feet wide from the federally improved channel in Great South Bay, opposite Patchogue, to the south end of Shinnecock Canal. The lengthy project (33.6 miles) traverses the inland waters through the Great South Bay, the Bellport Bay, the Narrow Bay, the Moriches Bay, the Quantuck Bay, and the Shinnecock Bay. The channel is maintained by the USACE which performs maintenance dredging as necessary. Dredge materials are typically placed at upland locations after coordination with local sponsors. Activities associated with the Long Island Intracoastal Waterway Federal Navigation Project could affect coastal processes, vegetation, wildlife, and access and circulation and are likely to correspond or conflict with goals, objectives, and management strategies proposed in the GMP.

▸ NEW YORK STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) 2011–2014

The Statewide Transportation Improvement Program (STIP) is a list of all projects (or project phases), in New York State proposed for Federal funding that are scheduled to begin in the four federal fiscal years (FFY) 2011 - 2014 (between October 1, 2010 and September 30, 2014). This time frame is mandated by regulations promulgated under federal law in Title 23, United State Code, Section 135. The most recent STIP for New York State was formally approved on September 30, 2011.

The STIP begins as a compilation of regional Transportation Improvement Programs that are generally adopted every two years by Metropolitan Planning Organizations (MPOs), including rural areas where NYSDOT is responsible for programming federally funded projects, and evolves into a comprehensive list of all highway and transit projects that propose to use Federal funds. The STIP is required to be updated at least every four years. The State may elect to update the Program more frequently. Projects that may be implemented and funded through STIP are likely to correspond or conflict with the goals, objectives, and management strategies proposed in the GMP, particularly in the area of access and circulation.

▸ NEW YORK METROPOLITAN TRANSPORTATION COUNCIL REGIONAL TRANSPORTATION PLAN 2010–2035

Updated every four years, the Regional Transportation Plan (RTP) both forecasts future trends and provides a blueprint for long-range strategic transportation studies and investments. NYMTC is the designated Metropolitan Planning Organization (MPO) for New York City, Long Island, and the lower Hudson Valley. It is responsible for a continuing, coordinated, and comprehensive transportation planning process in its Region in order to receive federal transportation funding. The 2010-2035 Regional Transportation Plan moves the region forward based on shared goals that will ensure that NYMTC and its partners:

- Enhance the regional environment
- Improve the regional economy
- Improve the regional quality of life
- Provide convenient, flexible transportation access within the region
- Build the case for obtaining resources to implement regional investments.

Implementation of the RTP is likely to correspond or conflict with the goals, objectives, and management strategies proposed in the GMP, particularly in the area of access and circulation.

▸ BROOKHAVEN 2030 PLAN

The town of Brookhaven is developing a comprehensive plan to guide the look, function, and evolution of the town through 2030. The plan will consider social, economic, and environmental factors holistically and includes conservation of environmental resources and improvements in infrastructure. Improvements could include preservation of open space, protection/restoration of the environment, revitalization of pedestrian-oriented downtowns, preservation and development of a sense of place, and expansion of the range of transportation options. In the 2007 Issues and Opportunities Outreach Report prepared for Brookhaven 2030, Fire Island was recognized as an important resource to shelter from development impacts. Comments indicated that the Island's ecological needs, dynamic processes, and historic and cultural significance must all be addressed in a complimentary fashion. The enhancement and re-development of the William Floyd Parkway as a gateway to Fire Island National Seashore was also recognized as an opportunity during the scoping phase for the 2030 plan . The preliminary areas of interest defined by the Brookhaven 2030 are likely to correspond or conflict with goals, objectives, and management strategies proposed in the GMP.

▸ NEW YORK STATE COASTAL ZONE MANAGEMENT PLAN—COMBINED ASSESSMENT AND STRATEGY 2011–2016

The Coastal Zone Management Act (CZMA) encourages states to conduct self-evaluations of their coastal management programs every five years to assess significant changes in their coastal resources, management practices, critical needs, and priorities for enhancement. In November 2010, New York finalized its Coastal Zone Management Program (CZMP) Section 309 Assessment and Strategies for July 1, 2011 through June 30, 2016. The document evaluates nine potential coastal enhancements areas, including public access, coastal hazards, ocean and Great Lakes resources, wetlands, cumulative and secondary impacts, marine debris, special area management plans, energy and government facility siting, and aquaculture. In addition, the assessment continues the integration of the principles of ecosystem-based management into CZMA activities. The 2011-2016 Combined Assessment and Strategy includes potential approaches for improving several of the identified enhancement areas. Strategies include:

- updating the Significant Habitat Program
- establishing a direct permit program for activities within State designated Significant Coastal Fish and Wildlife Habitats
- updating the NYS coastal policies to explicitly address marine debris and resource impacts
- expanding the scale at which Local Waterfront Revitalization Programs are developed to more closely align with regional and ecosystem-based planning
- developing an amendment to the NYS CZMP through a Long Island South Shore Estuary Special Area Management Plan
- developing phased amendments to the NYS CZMP relative to habitat protection and criteria for siting wind-energy generation and transmission facilities in New York, the Atlantic Ocean, and the Great Lakes (NYS DOS 2010)

The changes to the NYS CZMP and their implementation have the potential to affect geology and coastal processes,

water resources, wildlife and wildlife habitat, visitor use, socioeconomic environment, and Seashore operations and are likely to correspond or conflict with the goals, objectives, and management strategies proposed in the GMP.

▸ LONG ISLAND SOUTH SHORE ESTUARY RESERVE COMPREHENSIVE MANAGEMENT PLAN

The Long Island South Shore Estuary Reserve (SSER) extends from the New York City line in Nassau County east for 75 miles to the Village of Southampton in Suffolk County. The mean high-tide line on the ocean side of Long Island serves as the southern border of the Reserve, while the inland limits of the drainage areas serve as the northern border. The Reserve includes one of the state's most distinctive estuaries and a 326-square-mile watershed in Nassau and Suffolk counties. The NYS Legislature found that the Reserve is vital to the local economy and natural resources; therefore, must be protected. Subsequently, the South Shore Estuary Council was created to represent the diverse interests of the Reserve. The Council, with the assistance of the NYS Division of Coastal Resources, developed the Long Island (SSER) Comprehensive Management Plan (CMP). The plan, which provides the foundation for the long-term health of the Reserve's bays, tributaries, tidal wetlands, wildlife, tourism, and economy, was adopted by the Council on April 12, 2001. Based on recommendations in the SSER CMP, a total of 94 state-assisted projects were supported by federal and local governments, non-profit organizations, and others between January 1, 2006 and December 31, 2010. The projects were focused on:

- Improvements and maintenance of water quality
- Protection and restoration of living resources
- Expansion of public use and enjoyment at SSER
- Sustainability and expansion of the estuary-related economy
- Increasing education, outreach, and stewardship
- An Amendment to the 2001 plan is currently under development. Actions proposed in the Long Island South Shore Estuary Reserve Comprehensive Management Plan have the potential to affect water resources, wildlife and wildlife habitat, visitor use, and socioeconomic environment, and are likely to correspond or conflict with the goals, objectives, and management strategies proposed in the GMP.

▸ SUFFOLK COUNTY VECTOR CONTROL AND WETLANDS MANAGEMENT LONG-TERM PLAN

In cooperation with the Suffolk County Department of Public Works (SCDPW) Vector Control Division, the Suffolk County Department of Health Services (SCDHS) is overseeing the development and implementation of a Suffolk County-wide vector control and wetlands management plan. The overall agency goals include:

- Develop an effective long-term vector control program, including a comprehensive wetlands management component
- Minimize pesticide usage while protecting public health
- Preserve and restore wetlands managed by vector control via open marsh water management, reversion of ditched areas, and other alternatives.

The actions proposed in the Suffolk County Vector Control and Wetlands Management Long-Term Plan have the potential to affect water resources, wildlife and wildlife habitat, visitor use and Seashore operations and are likely to correspond or conflict with goals, objectives, and strategies proposed in the GMP.

▸ VILLAGE OF PATCHOGUE LOCAL WATERFRONT REVITALIZATION PROGRAM

In 2006, the NYS DOS awarded the Village of Patchogue an Environmental Protection Fund Local Waterfront Revitalization Program grant. With the grant the village was able to develop a Local Waterfront Revitalization Program and Harbor Management Plan for its coastal area. The program/plan includes an inventory and analysis of existing conditions; a summary and consideration of local waterfront revitalization policies; proposed land and water uses and proposed projects; potential implementation techniques at the local, state, and federal levels; maps and illustrations; and compliance with the State Environmental Quality Review Act (SEQRA). The Seashore's administrative headquarters, maintenance facility, and ferry terminal are located on the Patchogue River within the Waterfront Revitalization Area boundary. The plan serves as a strategy for local management of the natural, public, working, and developed waterfronts (Village of Patchogue 2008).

Elements of Patchogue's Local Waterfront Revitalization Program have the potential to affect water resources, access and circulation, visitor use, and socioeconomic environment and are likely to correspond or conflict with goals, objectives, and management strategies proposed in the GMP.

▸ MARINE PROTECTED AREA

Fire Island National Seashore is among 21 coastal NPS units designated as Marine Protected Areas (MPAs) under Executive Order 13158 – Marine Protected Areas, signed by President William Clinton in May 2000. An MPA is defined as any area of the marine environment that has been reserved by Federal, State, territorial, tribal or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources within it. The purpose of the national system of MPAs is to enhance public recognition of ocean and coastal parks; strengthen the management, protection, and conservation of existing MPAs; and encourage interagency cooperation. The MPA designation does not result in the establishment of any new regulatory authority or interfere with the exercise of existing agency authorities. The national system is a mechanism to foster greater collaboration among participating MPA sites and programs to enhance stewardship of the waters of the United States.

▸ NATIONAL OCEAN POLICY

Executive Order 13547 – Stewardship of Oceans, Our Coasts, and the Great Lakes was signed by President Barack Obama on July 19, 2010, and is commonly known as the National Ocean Policy. This executive order directs federal agencies to follow the recommendations of the Interagency Ocean Policy Task Force and to implement those recommendations under the guidance of the National Ocean Council.

Implementation of the National Ocean Policy is structured around nine priority objectives:

1. **Ecosystem-Based Management:** Adopt ecosystem-based management as a foundational principle for the comprehensive management of the ocean, our coasts, and the Great Lakes.
2. **Coastal and Marine Spatial Planning:** Implement comprehensive, integrated, ecosystem-based coastal and marine spatial planning and management in the United States.
3. **Inform Decisions and Improve Understanding:** Increase knowledge to continually inform and improve management and policy decisions and the capacity to respond to change and challenges. Better educate the public through formal and informal programs about the ocean, our coasts, and the Great Lakes.
4. **Coordinate and Support:** Better coordinate and support Federal, State, tribal, local, and regional management of the ocean, our coasts, and the Great Lakes. Improve coordination and integration across the Federal Government and, as appropriate, engage with the international community.
5. **Resiliency and Adaptation to Climate Change and Ocean Acidification:** Strengthen resiliency of coastal communities and marine and Great Lakes environments and their abilities to adapt to climate change impacts and ocean acidification.
6. **Regional Ecosystem Protection and Restoration:** Establish and implement an integrated ecosystem protection and restoration strategy that is science-based and aligns conservation and restoration goals at the Federal, State, tribal, local, and regional levels.
7. **Water Quality and Sustainable Practices on Land:** Enhance water quality in the ocean, along our coasts, and in the Great Lakes by promoting and implementing sustainable practices on land.
8. **Changing Conditions in the Arctic:** Address environmental stewardship needs in the Arctic Ocean and adjacent coastal areas in the face of climate-induced and other environmental changes.
9. **Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure:** Strengthen and integrate Federal and non-Federal ocean observing systems, sensors, data collection platforms, data management, and mapping capabilities into a national system and integrate that system into international observation efforts.

IMPACT TOPICS

To focus the environmental analysis, the issues identified during scoping were used to derive a number of "impact topics." Impact topics are resources of concern that could be affected, either beneficially or adversely, by implementing any of the proposed alternatives and are identified on the basis of federal laws, regulations, Executive Orders, NPS *Management Policies 2006* (NPS 2006), and the results of scoping and coordination with other agencies and the public. Impact topics retained for detailed analysis within this draft GMP/EIS include:

- Natural Resources
  - » Coastal Processes and Floodplains
  - » Water Resources
  - » Vegetation
  - » Wildlife and Wildlife Habitat
  - » Special-Status Species
- Cultural Resources
  - » Cultural Landscapes
  - » Historic Buildings and Structures
  - » Collections and Archives
  - » Archeology
- Wilderness
- Visitor Use and Experience
- Access and Circulation
- Seashore Operations
- Socioeconomic Environment

For a detailed description of these resources, please refer to Chapter Three: Affected Environment.

The impact topics are examined across the spectrum of activities associated with each of the management alternatives, including those that are common to all alternatives.

Impact Topics Dismissed from Further Consideration

The NPS considered the following impact topics but did not analyze them further, because they were irrelevant to the alternatives, would have no discernible impacts, or required no more detailed work to understand their impacts in the context of the general management plan.

▸ AIR RESOURCES/AIR QUALITY

The Clean Air Act and NPS Management Policies 2006 (NPS 2006) require consideration of air quality impacts related to NPS projects. Fire Island is designated as a Class II area by the U.S. Environmental Protection Agency (EPA), meaning that the state may permit a moderate amount of new air pollution as long as neither ambient air quality standards --nor the maximum allowable increases over established baseline concentrations are exceeded. The proposed actions would have some negligible, short-term impacts on air quality. In particular, the operating of equipment, vehicles, and other construction activities, such as building, demolition, or rehabilitation, could result in temporary increases in vehicle exhaust and emissions. However, hydrocarbons, nitrates, and sulfur dioxide emissions, as well as any airborne particulates created by fugitive dust plumes would be rapidly dissipated. Fire Island would retain its "roadless" character, and driving would continue to be limited. The Seashore would continue its involvement in the NPS Green Parks initiative and would work to reduce or eliminate impacts on air quality resulting from Seashore operations. Overall, there could be negligible impacts on local air quality; however, such impacts would be short-term, lasting only as long as construction.

▸ PRIME AND UNIQUE FARMLANDS AND FARMLANDS OF STATEWIDE IMPORTANCE

According to the U.S. Department of Agriculture's Natural Resource Conservation Service (USDA/NRCS), prime farmland soils are present at the William Floyd Estate, i.e., Riverhead sandy loam and Sudbury sandy loam soil types (USDA 2009). Farmland of Statewide Importance, another USDA designation, is also present at the Estate in the form of Deerfield sand, Plymouth loamy sand, and Wareham loam sandy soil types. The areas identified as Prime Farmland and Farmland of Statewide Importance at the Estate are currently occupied by forests, agricultural fields, and maintained meadows. Although present within the project area, no

"unnecessary and irreversible conversion of farmland to non-agricultural uses" (Farmland Protection Policy Act of 1980) is expected under the proposed alternatives. Thus, no impacts to prime or unique farmlands are expected.

▸ INDIAN TRUST RESOURCES

U.S. Department of the Interior (DOI) Secretarial Order 3175 requires that any anticipated impacts to Indian Trust resources from a proposed project or action by DOI 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. There are no known Indian Trust resources at Fire Island National 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.

▸ SACRED SITES

There are no known sacred sites within the Seashore. The Shinnecock Nation is a federally recognized tribe based on the eastern most end of Long Island. The Unkechaug Indian Nation is a New York State recognized tribe having historic association with Fire Island National Seashore, particularly the William Floyd Estate. The planning team initiated a consultation process with representatives of the Shinnecock Nation and the Unkechaug Indian Nation in September 2008. As of this date, tribal representatives have raised no concerns or issues regarding sacred sites; therefore, the impact topic of sacred sites was dismissed from further analysis. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during the implementation of the GMP, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) would be followed.

▸ ETHNOGRAPHIC RESOURCES

As noted in the Ethnographic Overview and Assessment (EO&A) prepared for the Seashore, ethnographic resources are sometimes assumed to be only Native American in origin; more rarely, groups of particular ethnic or religious backgrounds also are considered. In the case of Fire Island NS, the ethnographic overview considered both off-island and on-island groups and communities. Both groups and communities reflect the diversified uses and interests of the Fire Island cultural landscape and its Long Island and regional associations. The Fire Island communities and segments of Seashore visitors were considered in addition to the off-island Floyd family descendants, the Native American community, the Mastic Beach residential community, and various groups of hunters and fisherman (Low et al. 2006).

According to the findings of the EO&A, the Unkechaug Indian Nation, a New York State-recognized tribe, has specific ethnographic relationships with Fire Island and the William Floyd Estate, including whaling, wampum manufacture from bay quahogs, and wage labor and indentured servitude for the Floyd family. Ethnographic relationships refer to cultural ties between groups and communities and the materials resources of Fire Island and the Floyd Estate but do not necessarily involve a traditional association (Low et al. 2006).

The report identified Great South Bay and the larger landscapes associated with Fire Island and the William Floyd Estate as having important ethnographic relationships with a number of groups, but stopped short of identifying them as ethnographic resources that are typically precise, spatially discrete locations. The report did not identify specific ethnographic resources within Fire Island National Seashore.

▸ NATURAL SOUNDSCAPES

As described in NPS Management Policies 2006 and NPS Director's Orders (DO) #47: *Sound Preservation and Noise Management,* preservation of natural soundscapes associated with national park units is an important part of the NPS mission. Natural soundscapes exist in the absence of human-caused sound. The natural, ambient soundscape is the aggregate of all natural sounds that occur at the Seashore beyond the range of sounds that humans can perceive. This sound can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sounds considered acceptable varies among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. The proposed alternatives would include efforts to promote natural soundscapes within the Seashore. The presence and use of vehicles would continue to be seasonal and concentrated in specific areas. The noise generated by passing boats and aircraft may be a common experience, but it is not constant. In more isolated areas of Fire Island such as the Fire Island Wilderness there

would continue to be greater opportunities to experience natural soundscapes. Overall, any adverse impacts associated with the proposed alternatives would be negligible.

▸ NIGHT SKY AND LIGHTSCAPES

In accordance with NPS *Management Policies 2006*, the NPS strives to preserve natural ambient landscapes and other values that exist in the absence of man-made light. Fire Island National Seashore is located in one of the most densely developed regions in the world. In addition to its proximity to New York City, the communities and Seashore facilities located on Fire Island produce light and also affect the night sky. As a result, there are constant impacts on the night sky, even in some of the most obscure areas. The proposed alternatives could include efforts to reduce impacts to the night sky within the Seashore's facilities; however, none of the alternatives would measurably contribute (adversely or beneficially) to existing conditions. Therefore, the impact topic of night sky/nightscapes was dismissed from further analysis.

▸ ENERGY USE, CONSERVATION POTENTIAL, AND SUSTAINABILITY

The Council on Environmental Quality (CEQ) guidelines for implementing the National Environmental Policy Act (NEPA) require an examination of energy requirements and conservation potential as a possible impact topic in environmental documents. Fire Island National Seashore is committed to incorporating proven sustainable practices into all aspects of future operations and management of Fire Island. The objectives of sustainability are to design structures to minimize adverse impacts on natural and cultural values; to reflect their environmental setting; to maintain and encourage biodiversity; to construct and retrofit facilities using energy efficient materials and building techniques; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy-efficient and ecologically responsible materials and

techniques. It also implies operational sustainability that supports cost-effective and efficient management of the Seashore. These same practices also ensure that seashore operations and facilities achieve a level of resiliency that enables them to more effectively respond to both gradual and extreme changes in environmental conditions.

All of the proposed alternatives subscribe to and support the practice of sustainable planning and design, including but not limited to sound energy practices, affirmative green procurement practices, stormwater management, and waste minimization. The Seashore would encourage suppliers and contractors to follow sustainable practices and address sustainable practices in any programs and operations. Although some adverse impacts would occur during construction, overall there would be beneficial impacts relating to energy use and conservation. However, the adverse impacts would be short-term, and the benefits would be negligible in comparison to improved energy use and conservation within the Seashore as a whole. Therefore, the impact topic of energy, conservation potential, and sustainability was dismissed from further analysis.

▸ ENVIRONMENTAL JUSTICE

All federal agencies are required to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations (Executive Order 12898). This impact topic was eliminated from further evaluation because none of the alternatives presented in this document would result in disproportionately high adverse environmental effects on minority or low-income communities. There would be no air or water pollution effects that would affect human health. Economic impacts from employment, associated income, and construction are expected to be modest, but beneficial. There would be no change in land use in the surrounding area that could affect minority or low-income communities.

▸ PUBLIC HEALTH AND SAFETY

Providing a safe and healthy park experience is always central to NPS planning. This is especially true when new developments are planned and new programs or patterns of use are introduced. The alternatives in this draft GMP/EIS incorporate all appropriate steps to ensure the safety of NPS staff, the visiting public, and any contractors. No actions are proposed that would increase health and safety risks to either NPS staff or visitors. Therefore, the impact topic of public health and safety is dismissed from further analysis.

2: The Alternatives and Their Common Elements

OVERVIEW This chapter of the draft GMP/EIS outlines alternative approaches for managing Fire Island National Seashore (the Seashore). The alternatives are general in nature, not detailed, specific, or highly technical. As funds become available to implement actions consistent with the approved GMP (e.g., undertaking landscape treatments, constructing or rehabilitating facilities), appropriate site-specific planning and compliance will be completed including further risk assessments and scenario planning for climate change. It is important to note that all construction and staffing proposals under the various alternatives are subject to National Park Service (NPS) funding limitations and priorities and are expected to be phased over the life of the GMP.

The Seashore includes two separate and distinct units – Fire Island and the William Floyd Estate (the Estate). The Seashore's headquarters and primary maintenance facility are located in the village of Patchogue, as is the Ferry Transportation Center that serves Watch Hill on Fire Island. The units are separated by the Great South Bay and are vastly different in composition and overall character. To properly address the future needs of these units, two separate sets of management alternatives have been developed. While some common elements apply to both units, the management alternatives are organized somewhat differently and are presented in separate sections.

The Otis Pike Fire Island High Dunes Wilderness Area (referred to as the Fire Island Wilderness) is also addressed in the draft GMP/EIS. The general management direction proposed for the Fire Island Wilderness is described in this chapter. Consistent with direction that the planning team received from the NPS Wilderness Stewardship Office in Washington, DC, a draft Wilderness Stewardship Plan appears in the appendix of the draft GMP/EIS. A final Wilderness Stewardship Plan will be approved and released concurrent with the final GMP/EIS.

DEVELOPING NEW DIRECTIONS: DECISION POINTS

The planning team developed two action alternatives in response to public input and an analysis of the Seashore's legislation, purpose and significance, fundamental resources and values, and goals. After examining this information, the team identified five core questions, or "decision points," that were central to the development of the management alternatives.

1. What are the ways that the NPS can ensure resource protection while facilitating a safe, rewarding, and relevant experience for visitors and residents?
2. How do we develop an integrated management model that capitalizes on partnerships to encourage the long-term protection of Fire Island resources?
3. What are the best and most appropriate methods for moving people, goods, and services to, from, and along Fire Island?
4. How do Seashore staff and their partners operate and maintain the Seashore in a flexible, proactive, sustainable, and cost- effective way over the long term?
5. How can the NPS ensure resource protection and a high-quality visitor experience at the William Floyd Estate?

MANAGEMENT PHILOSOPHY

A collaborative approach to stewardship of Fire Island that brings together the NPS, the Fire Island communities, government agencies, and all Seashore partners is essential for the following reasons:

- Fire Island is a dynamic place where natural and human forces are interwoven to create a diverse landscape.
- As stated by Congress in the Seashore's enabling legislation, the primary purpose of the National Seashore is to protect and preserve natural resources for future generations.
- Natural change is an integral part of the functioning of a barrier island. Within this context, the human needs of today and tomorrow must be mutually understood and addressed in a manner that supports long- term resource protection.
- At the Seashore, the NPS fosters a relationship between people and the natural and cultural environment that is healthy and sustainable.
- A mosaic of jurisdictions involving private property owners, non-profit institutions, the villages of Saltaire, Ocean Beach, and Bellport, the towns of Islip and Brookhaven, Suffolk County, the State of New York, and the National Park Service, all have real property interests on Fire Island, each with its own, sometimes conflicting, management mandates and guidelines.
- Activities and practices within this mosaic of jurisdictions can affect the Seashore's resources, just as NPS management activities can affect these other interests on Fire Island.

MANAGEMENT GOALS

Management goals articulate the ideal conditions that park managers strive to attain in perpetuity. Following are specific goals for Fire Island National Seashore (not listed in priority order):

Resource Management

1. Partner with the public, Fire Island communities, state and local governments, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.
2. Provide for the stewardship of the coastal environment and its cultural and natural systems, while recognizing that the Seashore is part of a larger ecological, social, economic, and cultural context.
3. Management decisions about natural and cultural resources are based on scholarly and scientific information, fundamental resources and values, consultation with appropriate agencies and communities, and consideration of the broader context of the resources and Fire Island.

Land Use and Development

1. Partner with others to ensure that land-use and development practices undertaken on Fire Island promote ecological health and environmental quality in this dynamic environment, and acknowledge and respect the community character and the continued presence of Fire Island's communities.

Seashore Experience

1. Through outreach and education, the Seashore will foster public understanding and appreciation of the purpose and significance of the Seashore and its natural and cultural resources, as well as the public's vital stewardship role in protecting Fire Island.
2. Provide a wide variety of quality recreational and interpretive experiences for a broad range of audiences, emphasizing human interactions with the environment and the historical and cultural values of the Seashore.

Transportation and Access

1. Preserve the "roadless" character of Fire Island and ensure that water-based transportation is the primary form of access to Fire Island whenever and wherever feasible.
2. Ensure that the transportation routes to and from NPS facilities on Fire Island and Long Island are well known, well-marked, and easy and safe to navigate.

3. Enable broad access to NPS facilities by all members of the public regardless of income or physical ability to the greatest extent practicable.

Park Operations and Maintenance/Facilities

1. Provide a safe, healthy, and accessible environment for visitors, residents, and NPS employees as feasible and appropriate.
2. Develop facilities that are environmentally sensitive and sustainable and can be adapted to the changing environment.
3. Assume a leadership role in implementing sustainable design and management practices.

RESPONDING TO CLIMATE CHANGE

Over the last decade, the NPS has consulted with the scientific community, federal agencies, non-profit organizations, and other informed parties to gather data and explore strategies to prepare the national park system for potential future impacts of a changing climate. Sea-level rise, extreme precipitation events, heat waves, and increases in severe winds or other phenomena related to climate change will alter how natural and cultural resources are managed, and the types of activities, facilities and infrastructure the NPS can support.

Climate change is expected to result in many changes to the Atlantic coast, including the northeastern coast of the United States. Both historical trends and future projections suggest increases in temperature, precipitation levels, accelerated rates of sea-level rise and intensity of weather events, such as storms, should be expected. In addition, climate change is expected to affect Fire Island's weather, resources (e.g., shorelines, vegetation, wildlife, historic sites, and archeological resources), and visitor use patterns. These changes will have direct implications on resource management, recreational facilities, park operations, and visitor use and experience. Some of these impacts are already occurring or are expected at Fire Island in the time frame of this management plan.

There are a number of executive orders, policies and plans that guide the national park system and Fire Island's response to climate change.

- Executive Order 11988 (1977) requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development.
- Executive Order 13653 (2013) directs federal agencies to prepare for the impacts of climate change by undertaking actions to enhance climate preparedness and resilience.
- Executive Order 13514 (2009) establishes an integrated strategy towards sustainability in the Federal Government and makes reduction of greenhouse gas emissions a priority for Federal agencies.

- Secretarial Order 3289, Amendment 1 (2010) directs each bureau and office of the Department to consider and analyze the potential climate change impacts when undertaking long-range planning exercises.
- Department of the Interior Climate Change Adaptation Policy (523 DM1) outlines a set of principles and provides guidance for integrating climate change adaptation strategies into policies, planning, programs and operations.
- NPS *Management Policies 2006* §9.1.1 guides sustainable facility planning and development.
- NPS Climate Change Response Strategy (NPS, 2010) outlines a four-prong approach to addressing climate change: science, adaptation, mitigation, and communication.
- NPS Climate Change Action Plan 2012-2014 (NPS, 2012) details actions and recommendations to implement the climate change response strategy.
- NPS Green Parks Plan (NPS, 2012) defines a collective vision and a long-term strategic plan for sustainable management of NPS operations including reducing greenhouse gas emissions and adapting facilities at risk from climate change.

Climate Change Response Strategy for Fire Island

Fire Island National Seashore encompasses a coastal landscape that has been shaped and re-shaped by wind and waves. The complex interaction of sediment, waves, and currents results in a dynamic landscape, with formations like beaches, dunes, and spits that shift overtime. The history of human activity on Fire Island – including NPS management over the last 50 years – has been reflective of this dynamic character and has taken the form of adaptation to or manipulation of Fire Island in some shape or form in response to changing conditions. We are now confronted with the observed trends and projected impacts of rising sea levels and climate change requiring a more formal and clearly articulated strategy for addressing changing conditions on Fire Island.

The draft GMP/EIS describes the approach that the Seashore would take to mitigate and adapt to the effects of climate change and over the next 20 years. Many opportunities exist for the NPS to incorporate climate change adaptation into long-term planning across the Seashore and at the William Floyd Estate. Specific options to protect Fire Island's resources include integrating long-term planning into Seashore operations, monitoring observed and projected climate trends, conducting climate-related vulnerability assessments for fundamental resources and values, monitoring climate sensitive species, and implementing a range of adaptive management actions.

▸ STRATEGIES FOR SEASHORE FACILITIES AND OPERATIONS

The Seashore's visitor use areas are in coastal environments and are vulnerable to future sea-level rise and storm surges. Climate change will result in significant effects on conditions at the Seashore, including impacts from sea-level rise and potentially destructive storm events. More detailed examination of these effects will be critical as actions in the approved GMP are analyzed and implemented at site-specific levels. Factoring in sea-level rise, these analyses will influence the type, design, location, and ultimate feasibility of park facilities and developments. When developments do occur, site-specific design will provide an outstanding opportunity for the Seashore to teach through example – to demonstrate forward thinking, innovative designs, flexibility, and readiness for change in response to sea-level rise.

Coastal resiliency will be incorporated into any new developed areas and adaptively reused structures and facilities. While the action alternatives propose a range of facility additions and renovations to expand recreational opportunities, proposed facility investments in the approved GMP will be evaluated using the following climate change strategies prior to project approvals to ensure the long-term sustainability of these investments. Future plans and studies would provide technical data and resource information to support the following strategies:

- Find creative solutions to limit impacts from future flooding, storm surge and other impacts on existing visitor and operations facilities. When these facilities are no longer viable to retain and use, transition to moveable and portable facilities or other means to continue to offer visitor services, as feasible.
- Remove existing visitor facilities and discontinue recreational uses where continued use is unsafe, infeasible, or undesirable due to changing environmental conditions.

- Avoid or minimize additions of new infrastructure, construction of high value assets or major investments in facility renovations within coastal flood or storm surge zones.
- Substantial facility investments within the FEMA 100-year floodplain, including an adjustment for projected sea-level rise by year 2100, should be avoided to the extent possible. Essential improvements within these flood-prone areas, such as rehabilitation of historic structures or provision of necessary facilities for beach access and recreation, will be carefully evaluated to determine whether facilities should be elevated, made portable, hardened or otherwise made resilient to potential flooding. Any decision to proceed with substantial improvements within the flood zone as adjusted for sea level rise will be made in compliance with Executive Order 11988.
- Transition wastewater and sewage treatment systems to more sustainable systems and facilities.
- Keep utilities and critical systems and infrastructure out of flood zones.
- Use up-to-date policy guidance to respond to changing conditions.

National parks can demonstrate how to minimize their contribution to global warming through practices such as energy efficiency and use of renewable energy. The Seashore will reduce the CO_2 emissions of NPS and concessioner operations, increase the use of renewable energy and other sustainable practices, and encourage the use of alternative transportation. Specific actions that the park would pursue, as feasible:

- Test, use, and promote carbon-neutral energy, innovations, and infrastructure for Seashore and partner operations.
- Consolidate Seashore operations to reduce energy consumption.
- Construct and operate visitor facilities with the highest sustainability standards possible.
- Use biodegradable/recycled resources and zero waste options.
- Upgrade/retrofit vehicle and vessel fleets and machinery for low emissions.
- Reduce vehicle miles traveled by Seashore staff and visitors who work in and use the park.
- Integrate climate change mitigation into all NPS business, operations, and management practices.
- Pursue Leadership in Energy and Environmental Design (LEED) certification for rehabilitated buildings as educational topic and as sustainable practice.

▸ STRATEGIES FOR RESPONDING TO CHANGING CONDITIONS

Fire Island National Seashore would use and promote innovation, best practices, and partnerships to respond to the challenges of climate change and its effects on park resources. By using and developing tools and monitoring methods, including seeking outside assistance, Seashore staff can better respond to climate change. Seashore staff would interpret climate change science and develop management strategies, which may include predicting and projecting expected changes. The Seashore would coordinate with other agencies in developing tools and strategies to help identify and manage climate change impacts. By adopting the best information on climate change as it becomes available, the Seashore would be positioned to respond quickly and appropriately to the local effects of climate change.

Consistent with DOI policies, Fire Island National Seashore would use an adaptive management framework to respond to the effects of climate change. Temperature and precipitation changes may require that the Seashore manages for native biodiversity and ecosystem function instead of managing for natural communities. In most cases, the Seashore would allow natural processes to continue unimpeded, except when public health and safety or the Seashore's fundamental resources and values are threatened. Scenario planning would likely play a pivotal role in developing the Seashore's responses to climate change.

The Seashore would coordinate with Fire Island communities and other stakeholders while implementing adaptation strategies that support the protection, preservation, and restoration of coastal wetlands and coastal processes, and can serve as vital tools in buffering coastal communities from the effects of climate change and sea-level rise. Some of the strategies the park would pursue, as feasible, include:

- Inventory, monitor and assess vulnerability of key attributes of the natural systems, cultural resources, and visitor experiences likely to be affected by climate change.

- Build resiliency of natural coastal resources to sea-level rise and other effects of climate change.
- Restore key ecosystem features and processes, and protect key cultural resources to increase their resiliency to climate change. By reducing other types of impacts on resources, the overall condition of the resources could more easily recover from or resist the impacts of climate change.
- Reduce current and future stressors to the resource and the environment; this would improve the condition of the resource and build resiliency in the ecosystem that would help to minimize future adverse effects of climate change.
- Reduce habitat fragmentation and increase habitat connectivity and movement corridors.
- Give highest priority to preserving cultural resources and artifacts in situ, coupled with sustainable efforts (intervention techniques) to mitigate and reduce stressors that might adversely affect the resource. As warranted to protect from loss due to sea-level rise and storm events, implement strategies to relocate or document cultural assets, or remove artifacts to safe locations.

▸ ENGAGE THE SCIENTIFIC COMMUNITY AND VISITORS IN CLIMATE CHANGE

Fire Island National Seashore would continue to collaborate with a variety of academic and scientific institutions, non-profit organizations and agencies on research and projects to find creative solutions for the long-term preservation of natural and cultural resources.

Education and interpretive programs help visitors understand climate change impacts at Fire Island and beyond, and how they can respond to climate change. NPS and its partners would engage visitors on the topic of climate change, provide the latest research and monitoring data and trends, inform the public about what response is being taken at the Seashore, and inspire visitors to aid in that response.

MANAGEMENT AREAS

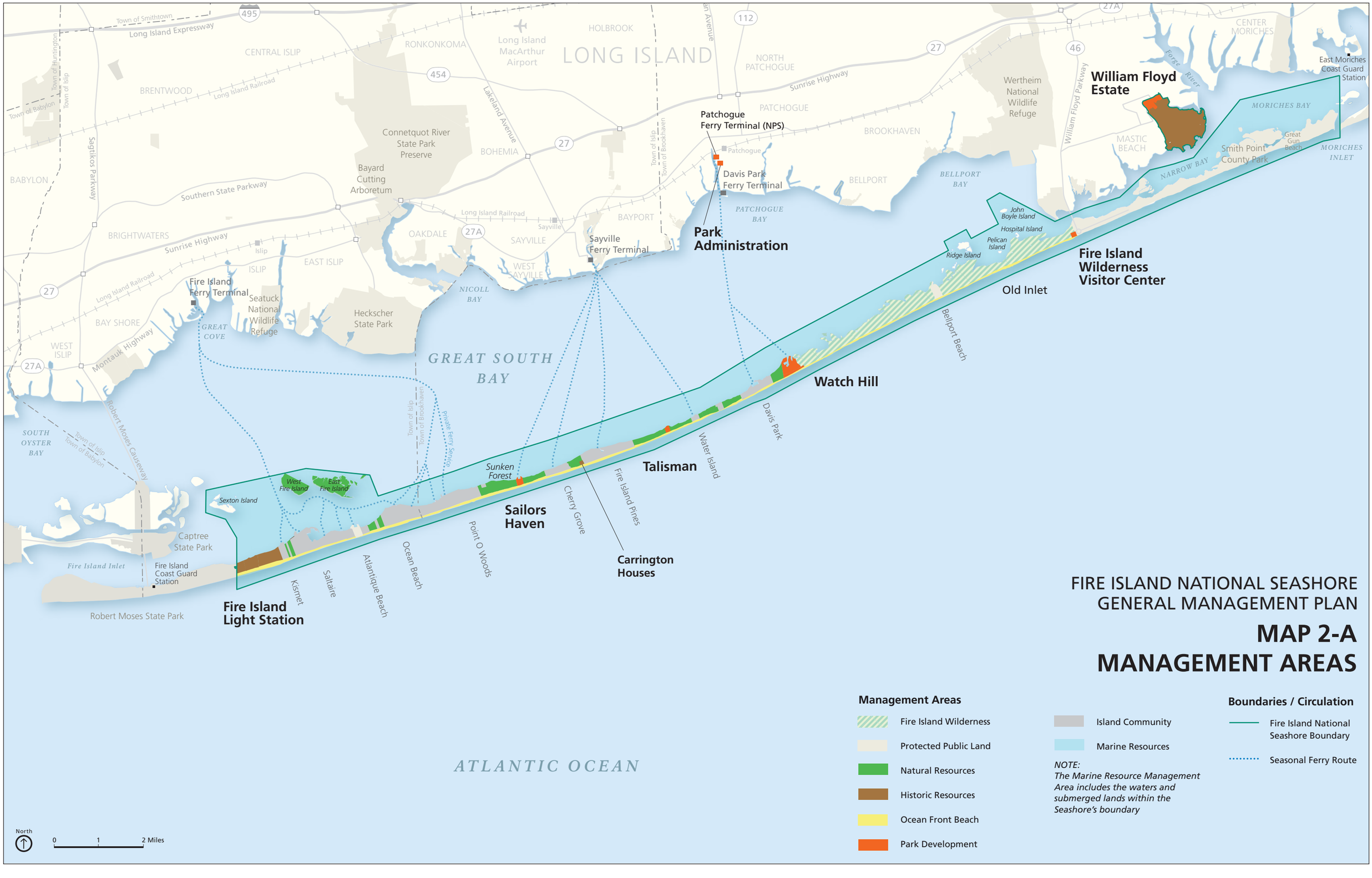
(Management Zoning)

NPS policies for park planning require the identification of management zones that guide park managers on how each part of a park should be managed to achieve desired future conditions. Park management zoning directs the location and character of development and other management activities within the park. It is used in combination with other policies governing proposed changes to parklands. To avoid confusion with land-use regulatory zoning that is also discussed in this plan, park management zones will be referred to as "Management Areas."

In this draft GMP/EIS, the management areas are the same for all alternatives. As the following map indicates, the planning team identified eight management areas within the Seashore boundary: Natural Resource, Historic Resource, Ocean Front Beach, Marine Resource, Park Development, Island Community, Wilderness, and Non-Federal Public Lands. The management areas possess different characteristics, based on the resources they encompass and may need to be adjusted if new information changes the current understanding of park or park-related resources and facilities. The management areas require different management approaches for resource management and visitor experience. It is important to note that not all management areas identified within the park boundary are under the ownership or control of the NPS.

The Seashore's enabling legislation directs the NPS to develop zoning standards that guide land use and development within the residential communities on Fire Island. These land use/ zoning regulations are called the Secretary of the Interior's Zoning Standards for Fire Island National Seashore (Secretary's zoning standards [36 CFR Part 28]). The Secretary's zoning standards identify three zoning districts that apply only to Fire Island:

- *Community Development District* encompassing the 17 developed communities
- *Seashore District* encompassing all portions of the lands and waters within the boundary of the Seashore on Fire Island which are not included in the Community Development District
- *Dune District*, an overlay district over the Community Development and Seashore districts, encompasses the area extending from the mean high water line to 40 feet landward of the primary natural high dune crest as it was mapped in 1976 and adopted by Congress in 1978. Although outdated, it is still used by the park to evaluate development within the district.



FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN

MAP 2-A
MANAGEMENT AREAS

Management Areas

- Fire Island Wilderness
- Protected Public Land
- Natural Resources
- Historic Resources
- Ocean Front Beach
- Park Development
- Island Community
- Marine Resources

NOTE:
The Marine Resource Management Area includes the waters and submerged lands within the Seashore's boundary

Boundaries / Circulation

- Fire Island National Seashore Boundary
- Seasonal Ferry Route


Service Entry
Visitor Exit
Cemetery
Park Development Area
Old Mastic House
Moriches Bay
Home Creek
Indian Point
Visitor Entry
Park Road
Neighborhood Road
The Vista
Historic Resource Area
VILLAGE OF MASTIC BEACH
Salt Marshes
Narrow Bay
FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN
MAP 2-B WILLIAM FLOYD ESTATE MANAGEMENT AREAS
Fire Island National Seashore
Public Access Road (Paved)
Point of Entry
Historic Resources
Park Development
Parking Area
Building

The Community Development District applies only to the Island Community Management Area, while the Seashore District applies to all of the remaining management areas. The Dune District applies to all of the management areas. The Fire Island National Seashore Federal Zoning Standards (CFR 36, Part 28) appear in Appendix C.

Management area descriptions apply to Fire Island, the Patchogue facilities, and the William Floyd Estate.

The resource conditions and appropriate activities for each of the management areas are described below.

▸ NATURAL RESOURCE AREAS

Description

This management area embraces lands within the Seashore that include off-shore islands in the Great South Bay as well as a number of bay-to-ocean tracts that are dispersed across Fire Island. These lands are undeveloped natural resource areas comprising the open spaces located between communities and/or Seashore facilities. They include freshwater wetlands, salt marsh, dune, forests, shrub, and grassland areas. The Sunken Forest is a notable example of a natural resource. These bay-to-ocean tracts range in size from the 8 acres located between Kismet and Seabay Beach (eastern half of Kismet) to the 167 acre tract encompassing Sailors Haven and the Sunken Forest. All of these areas fall within the Seashore District as described in the Secretary's zoning standards and may contain small pockets of private development including but not limited to the enclaves of Oakleyville, Blue Point Beach, and other private properties within the Seashore District. These developed areas are not considered part of the Community Development District defined by the Secretary's zoning standards.

Desired Resource Condition

In this area, natural resource values would be preserved or restored to obtain a higher degree of ecological integrity and resilience to changing climate conditions, and their associated natural processes would continue unimpeded to the greatest extent possible. In this area the bayshore would be naturalized and the impacts of adjoining bayside structures would be mitigated to the greatest degree possible. Improved properties within the management area (e.g., Oakleyville, Blue Point Beach) would be acquired on a willing-seller basis over time and would be removed, allowing these sites to return to their natural state.

Desired Visitor Experience

Visitor access to some of these areas would be managed through the use of trails and boardwalks to limit impacts to sensitive resources such as the Sunken Forest at Sailors Haven. In these locations, ranger-led programs, citizen-science programs, interpretive waysides, brochures, and other interpretive media would enable visitors to immerse themselves in these environments in a manner that enhances their understanding and appreciation of Fire Island's natural resources while ensuring the protection of those resources. Not all natural resource areas would be managed for visitor access; in some areas there would be no services or facilities.

Appropriate Kinds and Levels of Development

Development in this management area would be limited to trails and boardwalks that support public access and management activities, temporary structures that support resource management and research (e.g., bird blinds, monitoring equipment, etc.), and sensitively designed interpretive signage.

Appropriate Kinds and Level of Management Activity

This area would be managed for a high level of protection, monitoring, and scientific investigation.

Appropriate Kinds and Level of Visitor Use

Visitor access within this management area would be restricted primarily to trails and boardwalks except when participating in structured park programming (e.g., citizen science). Visitors to these areas would have the opportunity to participate in low-impact activities like walking, observing flora and fauna, participating in ranger or volunteer-led programming, and sketching or photography, etc. Some of these areas have neither visitor amenities nor ferry service. The likelihood that visitors to these areas would encounter NPS staff and other visitors is relatively low but would vary seasonally. During the summer the likelihood of encountering other visitors on these tracts would be somewhat higher than during other times of the year. Popular nature trails like those traversing the Sunken Forest or Watch Hill would experience significantly more traffic during the summer visitor season.

▸ HISTORIC RESOURCE AREAS

Description

This management area encompasses federal lands within the Seashore that contain historic resources that are on or eligible for listing on the National Register of Historic

Places and are managed for their cultural or historic significance. Historic resource areas encompass historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum and archival collections on federal lands that are largely managed for their cultural values. These areas include the Fire Island Light Station, the Carrington Estate, as well as a significant portion of the William Floyd Estate that has been defined as the historic core and Lower Acreage. All of these properties include substantial landscape features possessing both cultural and natural values.

Desired Resource Condition
The cultural resource values associated with these properties would be completely documented and, wherever possible and/or feasible, preserved for the understanding and appreciation of future generations.

Desired Visitor Experience
The Fire Island Light Station and the William Floyd Estate offer regular visitor programming during the course of the year. Visitors to those facilities would have the opportunity to view interpretive exhibits, tour the resource, and participate in a slate of regularly scheduled programs and special events. Visitors would be engaged by well-informed and enthusiastic interpretive rangers and volunteers. Group programs and tours would continue to be popular. The Carrington Estate would not be available for general public access; it would be used largely for park administrative purposes. If the property becomes home to an artist-in-residence program, visitors would be invited to participate in occasional open studio programs.

Appropriate Kinds and Levels of Development
Facilities may include: orientation space, sales space, indoor and outdoor exhibits, park and visitor support facilities, and amenities such as trails, boardwalks, and benches.

Appropriate Kinds and Level of Management Activity
The Fire Island Light Station and the William Floyd Estate would be staffed facilities managed for the preservation and interpretation of their cultural and natural resource values. Some administrative functions (e.g., interpretive staff offices, park housing) could occur within this management area.

Appropriate Kinds and Level of Visitor Use
Uses that are compatible with specific cultural resources, including ranger or volunteer-led interpretive tours, special events, self-guided walking tours, and interactive interpretive media exploration, would all be appropriate within this management area. Group tours of the Lighthouse and the William Floyd home (Old Mastic House) would continue to be limited in numbers to address visitor safety and resource protection considerations. Visitors could expect a high likelihood of encountering other visitors and NPS staff at the core of each of these properties. Visitors who venture out on their own to visit other parts of the property (e.g., Lower Acreage at the William Floyd Estate) would likely have fewer encounters with other visitors.

▸ OCEAN FRONT BEACH AREA

Description
The Ocean Front Beach Area includes the entire length of the beach from the eastern boundary of Robert Moses State Park to Moriches Inlet. Its northern boundary is roughly the seaward toe of the primary dune and extends south to the ocean water's edge. The 26-mile stretch of ocean beach encompassed by the Seashore is a dynamic resource that changes with each tide and can be significantly narrowed or widened based on prevailing conditions during any given year, season, tide, and/or storm. On the beach are busy lifeguard-protected areas as well as long stretches of unprotected beach. The Seashore manages three lifeguard-protected beaches on Fire Island.

The Fire Island communities, including the villages of Ocean Beach and Saltaire, manage recreational use of the beaches in front of their respective communities; the towns of Islip and Brookhaven as well as the village of Bellport also manage recreational activity on portions of the beach. The formally designated recreational beaches along Fire Island are supported by facilities in the adjoining Park Developed Area or Island Community Area. The beach also provides habitat for critical Threatened and Endangered Species (T & E species, e.g., Piping Plover). Beach nourishment has been conducted on community beaches over the years.

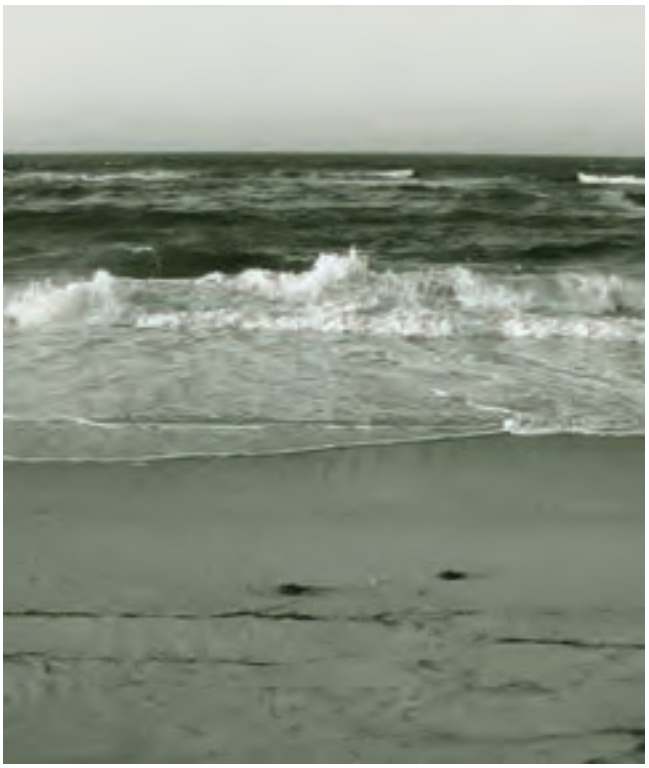
Desired Resource Condition
To the greatest degree possible, the natural beach is protected and natural beach processes are allowed to occur.

Desired Visitor Experience
Visitors to the Ocean Front Beach Area can enjoy a variety of opportunities to experience the management area's natural, recreational, and scenic values. Lifeguard-protected beach areas offer a monitored environment for water-based recreation. In other areas of the beach,

visitors may find more remote areas of beach where they can experience a much greater level of solitude. To the extent possible, all visitors would enjoy beaches that are accessible via designated dune crossings, are clean and free of debris, and offer good water quality. At appropriate times of the year, vehicular access would be permitted on the beach to support access to private properties and access for hunting, fishing, and other recreational activities.

Appropriate Kinds and Levels of Development
Development in this management area would be limited to the removable structures needed to support beach lifeguard operations. This includes items such as removable lifeguard stands, signs, and trash receptacles. Temporary exclosures to protect nesting birds and/or critical habitat would also be permitted. The construction of permanent structures or other development would be prohibited, with the exception of designated dune crossings.

Appropriate Kinds and Level of Management Activity
The intensity of management activity varies from location to location and from season to season. During the summer season, the most intensive management activity would be concentrated in the areas of the lifeguard-protected beaches, where managing for the safety of a large number of visitors would be paramount. These areas would be staffed with lifeguards and an increased visitor and resource protection staff presence. During other seasons, greater emphasis would be placed on managing driving, fishing, and hunting activities on the beach and also on monitoring and managing for nesting birds and protection of beach plants. There are times when driving on the beach must be temporarily prohibited to protect threatened and endangered shorebirds and their nests. Driving activity would continue to be undertaken consistent with regulations found in 36 CFR as amended by the NPS through the rule-making process. Beach management activities such as beach nourishment may be permitted on the beaches in accordance with the Secretary's zoning standards subject to all applicable compliance requirements and consistent with the approved GMP and/or the Fire Island Inlet to Montauk Point Reformulation Study (FIMP). Because of the potential impact of beach nourishment above and below mean high tide on adjoining federal tracts, the Seashore has a management interest in beach nourishment projects that occur in front of the communities.



Appropriate Kinds and Level of Visitor Use
Visitor activities would include day-use beach recreation, beach combing, hiking, surf fishing, picnicking, wildlife viewing, nature study, photography, participation in ranger-led activities, stewardship activities (e.g., shoreline cleanup, citizen science), and backcountry camping (by permit) on the beach in front of the Fire Island Wilderness. Limited vehicle use would be authorized during certain times of the year. At some locations in the Ocean Front Management Area, visitors are likely to experience crowding and a high level of social interaction, including encounters with other visitors and Seashore staff. At other locations, visitors are likely to experience a high degree of solitude, with only limited encounters with other visitors or Seashore staff.

▸ MARINE RESOURCE AREA

Description
This management area embraces all marine waters within the Seashore's boundaries. Approximately 14,600 acres or approximately 75 percent of the area within the Seashore's legislative boundary would be within the marine resource area. The Marine Resource Management Area includes both estuarine and ocean natural resources as well as submerged cultural resources. The Marine Resource Area extends approximately 4,000 feet into Great South Bay and

approximately 1,000 feet into the Atlantic Ocean from mean high water, and its resources must be recognized as integral parts of these larger water bodies.

The Marine Resource Management Area cannot be considered in isolation. Like the Ocean Front Management Area, there are multiple jurisdictions involved in the management of resources within this management area. NPS has jurisdiction over all activities on the surface and in the water column within the Seashore's boundaries, regardless of land ownership. On the Great South Bay, the towns of Islip and Brookhaven own the bottom lands within their boundaries, with the exception of specific individually owned lots and private marinas located at Cherry Grove, Ocean Bay Park, and Fire Island Pines, the Blue Point bottom lands (owned by The Nature Conservancy), and four NPS parcels. On the ocean side, New York State holds title to the Atlantic Ocean within the Seashore boundary but has granted full use and occupancy rights and ceded concurrent jurisdiction to the NPS. Navigation channels and aids to navigation (e.g., lights and buoys) are present on the bay side and are maintained by NPS and other agencies. The Great South Bay experiences heavy boating traffic during the summer season, with regularly scheduled ferry service traversing its waters as well as a large population of recreational boaters. Fishing and shellfishing are permitted and occur within Seashore waters.

Desired Resource Condition

The marine resources of the park are better understood and protected by the Seashore in collaboration with others to ensure the ecological integrity of the ocean and bay environments and to preserve Fire Island's cultural heritage.

The marine resource area is managed to ensure that water quality, submerged aquatic vegetation (SAV), marsh and shoreline habitats are protected and, where feasible, improved.

Desired Visitor Experience

Visitors to the Marine Resource Management Area would have the opportunity to engage in a number of water-based activities and visitor programming (e.g., off-shore fishing, motor boating, kayaking, canoeing, sailing, bay tours, clamming, swimming, surfing, etc.). Resource management activities that encourage citizen-science participation would also be encouraged.

Appropriate Kinds and Levels of Development

Development would be limited to navigation channels, navigational aids, and off-shore moorings. Equipment necessary for scientific research may also be located within the marine resource area.

Appropriate Kinds and Level of Management Activity

Working collaboratively with others, extensive inventory and monitoring of marine resources would be undertaken, as would the continued management and maintenance of navigation channels and aids to navigation. Marine research being undertaken by NPS and academic institutions would also occur. Seashore staff, the Suffolk County Police Department Marine Bureau, and NYS DEC would continue to patrol park waters to ensure visitor safety and resource protection. Fishing and shellfishing activities would continue to be permitted and monitored to insure that fish populations remain self-sustaining and habitats are not impacted. Monitoring assessments and regulation would be in cooperation with state and town agencies.

Appropriate Kinds and Level of Visitor Use

Motorized and non-motorized boating, swimming, research and interpretation would be appropriate kinds of visitor use in this management area. Visitor use would be managed to improve the quality of park resources, limit crowding, and reduce conflicts between uses.

▸ PARK DEVELOPMENT AREAS

Description

This management area includes the areas on federal lands where development occurs that supports visitor use, operations, maintenance, and administration. The Park Development Areas include: the Seashore's administrative headquarters, main maintenance facility, and ferry terminal in Patchogue, the visitor- use, operations, and maintenance facilities at the William Floyd Estate in Mastic Beach on Long Island; and developed areas at Sailors Haven, Talisman, Watch Hill and the Wilderness Visitor Center on Fire Island. The Lighthouse Tract does include some park support functions but is characterized as a Historic Management Area. A wide variety of facilities operated and maintained by the Seashore and its concessioners include ferry docks and marinas, snack bars, restaurants, boardwalks and trails, campground, visitor contact facilities, bathhouses, restrooms, curatorial storage, administrative buildings, maintenance facilities, park housing, and parking areas. A detailed description of Seashore operations and visitor facilities appears in Chapter 3 – Affected Environment.

Desired Resource Condition
The NPS, working with Seashore concessioners and others would ensure that the scale of development is appropriate to meet park and visitor needs. Facilities within the Park Development Areas are well maintained and are as safe as possible for all users. Seashore development would be designed to allow for adaptation and achieve resilience within the dynamic coastal environment.

Desired Visitor Experience
Visitors would experience clean, safe, well-maintained facilities and would be offered opportunities to enjoy the many facets of each Development Area including their recreational, educational, natural, and cultural assets. A wide range of visitor programming and media would be available at varying locations within the Seashore. These may include but would not be limited to ranger or volunteer-led and self-guided programming, evening programs, and varying degrees of interpretive signage, exhibits, and other media.

Appropriate Kinds and Levels of Development
Wide-ranging types of development would be permissible in this management area and could include: parking lots; operations, maintenance, administration and visitor use structures, and related facilities; park housing; boat docks; boardwalks and trails; snack bars; interpretive centers; restrooms; bath houses; and campgrounds, as appropriate.

Appropriate Kinds and Level of Management Activity
These areas would require an intensive management presence involving Seashore staff, concessioners, cooperators and volunteers. Management activities in this area would draw upon the talents of multiple divisions including administration, facility management, interpretation and visitor services, resource management, and visitor and resource protection.

Appropriate Kinds and Level of Visitor Use
Visitors to Park Development Areas would be able to engage in a number of activities including swimming, boating, hiking, camping, nature walks, ranger- and volunteer-led programs, guided canoe trips, etc. On a regular basis during the visitor season, the facilities at Sailors Haven and Watch Hill would be well used, and visitors would be highly likely to encounter other visitors and Seashore staff and would sometimes experience crowded conditions. At Talisman, weekends during the summer can be busy, and as at Sailors Haven and Watch Hill, visitors would be likely to encounter other visitors and some crowded conditions. During the week, Talisman can offer opportunities for a less crowded experience.

▸ ISLAND COMMUNITY AREAS

Description
This management area embraces areas within the Seashore that are defined as the Community Development District in the Secretary's zoning standards encompassing 17 island communities. This management area encompasses approximately 2,300 acres or 27 percent of upland on Fire Island within the Seashore's boundary that are privately owned, developed parcels.

Among the 17 communities are two incorporated villages, Ocean Beach and Saltaire. Within the community of Davis Park, the town of Brookhaven owns and manages a marina and Leja Beach. With the exception of the two incorporated villages, the Fire Island communities fall under the jurisdiction of either of the Long Island towns of Islip or Brookhaven.

Land use and development within this management area is based on local zoning that has met the Secretary's zoning standards. Zoning is administered and approved by local boards. Requests for variances to local zoning within the Community Development District (and hence the Island Community Management Area), require consultation with and a finding from the Superintendent of the Seashore.

There are 4,200 private properties within the Fire Island communities, the vast majority of which are used as seasonal residences. The larger concentrations of commercial properties are located in the village of Ocean Beach and the unincorporated communities of Ocean Bay Park, Cherry Grove, Fire Island Pines, and Davis Park. The density of residential development on Fire Island has increased since the Seashore's establishment. Concerns among Fire Island residents about preserving the character of their communities and managing their visitation have been raised throughout the planning process.

Desired Resource Condition
The distinctiveness of each community would be recognized in its contribution to the overall character of Fire Island. Residential development would continue to be low profile and maintained at a density consistent with the Secretary's zoning standards and the commercial areas would continue to primarily serve the needs of Fire Island's population. Communities would evolve in a way

that makes them more resilient and ecologically sound within the context of the dynamic coastal environment.

Desired Visitor Experience
Visitors to Fire Island could visit Fire Island's communities as well as Seashore facilities. Visitors would have the opportunity to view and appreciate a great array of historic and contemporary resort-style architecture and experience the distinctive qualities of each community they visit. They could also enjoy opportunities to dine and shop in Fire Island's communities and participate in nightlife. The Seashore would make its visitors aware that the communities are largely private and should be experienced accordingly.

Appropriate Kinds and Levels of Development
These areas are primarily privately developed for residential use. Commercial development is primarily to support Fire Island communities and residents. Park and recreational facilities, religious and civic facilities, and volunteer firehouses are also present in the communities. Development and land uses should be consistent with existing plans, local zoning, and other regulations as adopted by municipal, county, and state government.

Appropriate Kinds and Level of Management Activity
NPS management activity in these areas is limited to responding with an opinion in the case of a proposed zoning variance, permitting for shoreline management projects (e.g., bulkhead replacement, beach nourishment), and cooperating in the management of T&E species. NPS may also provide technical assistance for planning, interpretation, and resource protection and offer interpretive or educational programming at community venues.

Appropriate Kinds and Level of Visitor Use
The NPS role in monitoring or influencing visitor use in the Fire Island communities would be limited. Seashore visitors would be made aware of the private nature of the communities and would be asked to respect private property. Seashore visitors may be likely to take advantage of restaurants and shops as well as enjoy the architecture and overall ambiance of Fire Island's distinctive communities.

▸ WILDERNESS AREA

Description
This management area embraces the Otis Pike Fire Island High Dune Wilderness (referred to as Fire Island Wilderness) that stretches across 7 miles of the Seashore and contains a variety of barrier island ecosystems in a relatively natural condition. It is the only federally designated wilderness area in the State of New York. At 1,380 acres, it is also one of the smallest wilderness areas managed by the NPS. The Fire Island Wilderness is located in the eastern portion of the Seashore extending from Smith Point County Park, on the east, to Watch Hill on the west. An ocean-to-bay parcel of non-federal, publicly-owned land, Bellport Beach, lies roughly in the middle of the Fire Island Wilderness, separating it into an eastern and a western segment. The Fire Island Wilderness is accessible from Watch Hill (which is accessible seasonally by ferry or private boat) and by the Wilderness Visitor Center (located adjacent to Smith Point County Park, accessible year round by car or bus).

Desired Resource Condition
The Fire Island Wilderness is managed to maintain its wilderness character consistent with the Wilderness Act: being untrammeled, natural, and undeveloped and able to provide opportunities for primitive and unconfined recreation and other unique features as deemed important to the Fire Island Wilderness.

Desired Visitor Experience

Wilderness is described in the Wilderness Act 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." The visitor must accept wilderness largely on its own terms. Modern conveniences would not be provided for the comfort of the visitor and the risks of wilderness travel, potential accidents, wildlife, and natural phenomena must be accepted as part of the wilderness experience.

Appropriate Kinds and Levels of Development

Development within the Fire Island Wilderness would be limited to dune crossings, minimal maintenance of a path along the Burma Road Trace and the Smith Point West Nature Trail, and, when necessary, use of temporary signage to address visitor safety and resource protection. The placement of scientific instruments to support ongoing research and aids to navigation would also be considered and, if deemed appropriate, would be permitted. The installation, maintenance, or removal of any development would be undertaken in a manner consistent with the requirements of the Wilderness Act.

Appropriate Kinds and Level of Management Activity

The Fire Island Wilderness would be managed so as to preserve its specific wilderness character and qualities to ensure wilderness preservation. The natural flora, fauna, and physiographic conditions of this unique area would be preserved in a primitive state, and the entire wilderness would be administered as a natural ecosystem, where the influence of humans is minimal and the character of the area would be molded by the forces of nature. Cultural resources, as evidence of previous human actions, would continue to be minimally represented. Resources considered to be culturally significant would be documented and protected; resources not considered culturally significant would be removed or reclaimed by nature.

Appropriate Kinds and Level of Visitor Use

Some of the primary uses of the Fire Island Wilderness would include hiking, sunbathing, collecting beach plums and blueberries, hunting, and backcountry camping. Some traditional use by the Unkechaug Indian Nation and the federally recognized Shinnecock Nation would continue including ceremonial activities. Backcountry camping would be by permit only, and the number of permits and size and distribution of groups between the two zones would be monitored to maintain a sense of solitude. The most intensive use, where visitors would be likely to encounter others, would be on the eastern and western edges or gateways to the Fire Island Wilderness. In its interior, contact with other visitors would likely be very limited.

▸ NON-FEDERAL PUBLIC LAND AREAS

Description

This management area encompasses designated town and county parkland within the boundaries of the Seashore – an area of approximately 1,030 acres or 12 percent of upland. This area refers to Great Gun Beach (owned and managed by the town of Brookhaven) and Smith Point County Park (owned and managed by Suffolk County) at the eastern end of Fire Island, Bellport Beach (owned and managed by the village of Bellport), which bifurcates the Fire Island Wilderness, Leja Beach within the community of Davis Park (also owned and managed by the town of Brookhaven), and Atlantique Beach (owned and managed by the town of Islip) between the communities of Lonelyville and Atlantique.

Desired Resource Condition

These are not federal facilities. The desired resource condition would be defined by the plans, rules, and regulations that govern each of these facilities as carried out by various village, town, and county agencies. The NPS would work collaboratively with the owners and operators of these properties to ensure consistency of resource management goals and coordination of actions.

Desired Visitor Experience

These are not federal facilities. The desired visitor experience would be defined by the plans, rules, and regulations that govern each of these facilities.

Appropriate Kinds and Levels of Development

The town and county parks include a wide range of developed facilities including parking, lifeguarded beaches, bathhouses, food service, campground, and marinas, etc.

Appropriate Kinds and Level of Management Activity

NPS management activity in these areas is limited to participating in permitting for shoreline management projects (e.g., bulkhead replacement, beach nourishment), and cooperation in the management of T&E species. The NPS would collaborate with the owners and operators of these properties to ensure consistency of resource management goals and coordination of actions.

Appropriate Kinds and Level of Visitor Use
Activities at these facilities may include boating, camping, swimming, picnicking, surf-fishing, playground activities, shellfishing, beachcombing, etc. Visitors should expect to encounter others at any of these facilities on most summer days and may experience crowded conditions on weekends. Smith Point is a primary gateway to the Wilderness Visitor Center and the eastern-most edge of the Fire Island Wilderness.

Management Alternative 1:

CONTINUATION OF CURRENT MANAGEMENT PRACTICES

(No-Action Alternative)

Concept

Alternative 1 is the "No- Action" alternative. Under this alternative, current management practices and the use of approved and interim plans would continue. NPS would continue to collaborate with local, county, and state officials on an as-needed basis to address common regulatory, policy, and management issues. The NPS would continue to meet day-to-day operations, management, legal, and regulatory requirements based on existing plans and the availability of funds.

Resource Management in General

Resource Stewardship Planning
The NPS would continue to work collaboratively with its management partners to develop resource stewardship plans for the Seashore that are consistent with the management direction adopted in the final approved GMP and NPS *Management Policies 2006*.

Natural Resource Management

The NPS would continue to work to preserve the natural environment and take actions to retain and enhance natural processes.

Terrestrial Resources

▸ SUNKEN FOREST & OTHER MARITIME FORESTS

Bayside Restoration/ Shoreline Naturalization
The Sailors Haven Marina has been interrupting sediment processes, resulting in erosion impacts to the bay shore and the Sunken Forest. Similar adverse effects of hard structures interrupting littoral transport and accelerating bay shore erosion are occurring at other locations adjacent to the approximately 4 miles of hardened bay shoreline of the Seashore. The NPS would continue current efforts to better understand bay side sediment transport along the north shore of Fire Island and in particular at the Sunken Forest.

To mitigate the impacts of these existing hard structures, the NPS would continue to collaborate with New York State agencies and others to undertake research and demonstration projects to explore effective mitigation methods. In 2011, the Seashore began a demonstration project at Sailors Haven regarding bayside sediment transport and constructed a feeder beach to supply sediment to the system. The sand used to construct the feeder beach was provided through maintenance dredging of the nearby navigation channel. The feeder beach will have to be replenished periodically. The effect of this method will be studied and evaluated over time.

▸ THREATENED & ENDANGERED SPECIES

The NPS would continue its collaborative efforts to preserve and monitor critical habitats and open spaces for the protection of threatened and endangered (T & E) species. Two federally listed endangered bird species are known to nest within the Seashore — the Piping Plover (*Charadrius melodus*) and the roseate tern (*Sterna dougallii*). The state-listed threatened least tern (*Sternula antillarum*) and the common tern (*Sterna hirundo*) also nest on Fire Island. The black skimmer (*Rhynchops niger*) and the osprey (*Pandion haliaetus*) are bird species of special concern in New York State. Sea beach amaranth (*Amaranthus pumilus*) is a federally-listed threatened annual plant species that grows on some of Fire Island's beaches. The sea beach knotweed (*Polygonum glaucum*) is a New York State rare plant that can be found on Fire Island. A complete list of state and federally listed species appears in Chapter Three – Affected Environment.

Threatened & Endangered Species Management Plan
As funds become available, the NPS would update the Seashore's Threatened and Endangered Species Management Plan and include provisions to consider and address the potential effects of climate change and sea-level rise on T & E species.

Monitoring & Protection
The NPS would continue to monitor the populations of nesting shorebirds and plant populations that are listed as T&E species in collaboration with other agencies and

organizations. T & E species germination and nesting areas would continue to be protected with exclosures and symbolic fencing and monitored throughout the nesting season. Nests in high- traffic areas would continue to be protected through vehicle closures and public education. Symbolic fencing would also be used to protect T & E plant species.

Support Other Efforts to Protect Species of Special Concern

The NPS would be supportive of and work collaboratively with public agencies and non-profit conservation organizations to meet their conservation goals for Species of Special Concern within the Seashore's boundary, as appropriate and feasible.

▸ NATIVE PLANT AND ANIMAL SPECIES

Managing Native Plant and Animal Species

Native or indigenous plants naturally occur in the region in which they evolved. The NPS would work to maintain viable populations of native plant and animal species at the Seashore relative to the natural resource conditions and human health and would work to educate residents and visitors about those populations.

Native plant and animal species perceived as nuisances (such as biting insects, poison ivy, and raccoons) would be managed consistent with resource management and public safety objectives and based on guidance provided by existing Seashore management protocols, NPS *Management Policies 2006*, and associated Directors Orders. Native plant and animal species that are out of balance and are affecting other native plant and animal species and habitats would be managed by the NPS to ensure that such species do not crowd out or destroy species and habitats that support other native species.

Mosquito Surveillance & Management

The NPS would continue to engage in a regular program of mosquito surveillance based on the annual Mosquito Action Plan and Surveillance Protocols (Protocols). These would be updated annually in collaboration with county, state, and federal organizations, including Suffolk County Vector Control (SCVC), Suffolk County Department of Health Services, and the United States Geological Survey (USGS) and would be consistent with an approved Mosquito Management Plan completed by Suffolk County.

The SCVC would continue to manage mosquitoes within Smith Point County Park and residential communities located within the boundaries of the Seashore on Fire Island. The SCVC operates its program within the Seashore under a Letter of Authorization from the NPS. The SCVC would continue to be restricted from using any form of pesticides on the federal tracts of Fire Island and the William Floyd Estate as per management policies documented in the Protocols. In order to maintain and preserve the environment within the Seashore, NPS policy states that mosquito management interventions would be applied within the Seashore only if the presence of West Nile Virus (WNV) (and/or Eastern Equine Encephalitis (EEE)), in or near the park, is strong enough to suggest disease risk to humans and the risk of disease transmission would be substantially lowered by the intervention.

Tick Surveillance & Management

The NPS would continue to monitor ticks throughout the Seashore and provide education to visitors regarding ticks, tick-borne illnesses, preventive measures to avoid exposure to ticks and tick bites, and what to do in response to tick bites. The NPS would continue to focus its primary tick surveillance and management efforts at the William Floyd Estate. (See section on the William Floyd Estate for more information.)

In 2011 the New York State Department of Environmental Conservation (NYS DEC) completed a three-year study on the use of four-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 use corn as a lure to attract the deer. The baiting stations were located on non-federal lands on Fire Island. NYS approved the use of four-poster baiting stations for tick management in 2013. However, NPS continues to reject the use of the four-poster baiting stations on federal lands because the devices provide a regular, introduced food source for the deer population, in contradiction of NPS policies and NPS efforts at the Seashore to control the deer population.

Public Education & Outreach

The NPS would continue to disseminate information related to living with wildlife using a variety of means. Informational and interpretive exhibits, waysides, and print media regarding park natural resources and resource issues such as Lyme disease and ticks, feeding wildlife, and other topics would continue to be offered at visitor contact locations. Interpretive rangers and

other members of the Seashore's staff would also provide information on these topics to the public as feasible. Finally, the NPS would continue to post relevant information on the Seashore's website, on social media, and through local news outlets.

▸ NON-NATIVE INVASIVE PLANT & ANIMAL SPECIES

Managing Non-native Invasive Plant and Animal Species

The NPS would work to control non-native invasive plant and animal species that pose a specific threat to native species and other natural resources within the Seashore.

The spread of invasive species is recognized as one of the major factors contributing to ecosystem change and instability throughout the world. An invasive species is "a non-native species whose introduction does, or is likely to cause, economic or environmental harm or harm to human, animal, or plant health" (Executive Order 13112, 1999). These species have the ability to displace native species, alter fire regimes, damage infrastructure, and threaten human livelihoods. The NPS would continue to manage invasive species on Seashore lands through a suite of national and local programs, each based upon the following strategies: cooperation and collaboration, inventory and monitoring, prevention, early detection and rapid response, treatment and control, and restoration.

▸ NATURAL LIGHTSCAPE

Natural Lightscape

A "Natural Lightscape" is a place or environment characterized by the natural rhythm of the sun and moon cycles, clean air, and dark nights undisturbed by artificial light. Natural lightscapes, including dark night skies, are not only a resource unto themselves, but are an integral component of countless park experiences.

While the glow of Long Island's developed south shore is apparent from Fire Island, the more immediate experience on Fire Island is the opportunity to observe the naturally dark night sky as one looks out over the Atlantic Ocean. On Fire Island and at the William Floyd Estate, the naturally dark night sky would be preserved to the degree feasible. The NPS would minimize or reconfigure artificial light sources within the Seashore and would work with adjoining areas to reconfigure artificial lighting to better enable opportunities to see the moon, stars, planets, and other celestial features.

Marine Resources

▸ OCEAN AND ESTUARINE RESOURCES

Freshwater and Saltwater Marshes

Recent analysis of marsh development processes at the Seashore[1] have revealed that salt marshes do not appear to be keeping pace with the recent rates of sea-level rise. If the observed deficit continues, it is likely that the Fire Island marshes will become wetter; areas of high- marsh *Spartina patens* may convert to *Spartina alterniflora*, and open water habitat may increase, indicating that sea-level rise and climate change are having an effect on the marsh. There could also be landward encroachment of marshes into upland areas.

The NPS would work with state and local agencies to ensure the protection of freshwater wetlands and salt marshes. Working with the NPS Inventory and Monitoring program and state and local government agencies and other stakeholders (e.g., The Nature Conservancy) the NPS would update wetland maps and undertake regular trend analysis regarding water quality, nekton, vegetation communities, etc. to inform management decisions and facilitate adaptive management among agencies with shared stewardship for estuarine water resources. Salt marsh elevation monitoring, in concert with vegetation and marsh landscape change analysis, would continue in collaboration with the NPS Northeast Coastal Barrier Monitoring Network. Research to better understand the changes occurring in and affecting Fire Island's salt marshes would continue.

Fin fishing/ Shellfishing

Section 5 of the Seashore's enabling legislation provides that the Secretary shall permit hunting, fishing, and shellfishing on lands and water under the administrative jurisdiction of the Department of the Interior within Fire Island National Seashore in accordance with the laws of New York and the Unites States of America.

Recreational fishing

Recreational fishing is clearly permitted by the Seashore's enabling legislation. Commercial fishing is defined as fin fishing or shellfishing where the catch is sold. NPS considered commercial fishing during development

1 National Park Service, U.S. Department of the Interior. (2007). *Evaluation of Marsh Development Processes at Fire Island National Seashore (New York): Recent and Historic Perspectives. (*Technical Report NPS/NER/NRTR—2007/089).

of the Draft GMP/EIS, and reviewed 36 Code of Federal Regulations [CFR] 2.3 [d][4], which states that commercial fishing is prohibited in units of the National Park System unless specifically authorized by federal statutory law or treaty right. The Fire Island National Seashore enabling legislation does not specifically authorize commercial fishing within the Seashore. Thus, commercial fishing is prohibited. However, limited commercial shellfishing has been occurring within the Seashore boundary. Commercial fishing would likely continue under this alternative unless and until NPS takes action to enforce regulations at 36 CFR § 2.3(d)(4). Such action would require public notice as well as consultation with state and local agencies,

Recreational fin fishing and shellfishing may be restricted if it is determined that it is causing unacceptable impacts on Seashore resources and natural processes. Inventory, monitoring, consultation with fisheries managers, and research would be used to evaluate the effects of the harvest on Seashore resources and processes. Any recreational harvest should be managed to provide for self-sustaining populations of harvested species.

Although the NPS does not own the submerged bottom, the Seashore does have jurisdiction over the water column within the NPS boundary, described as the intertidal lands from mean high water out 4,000 feet into Great South Bay. Therefore, fin and shellfishing are subject to NPS policies and regulations, as well as NYS DEC regulations, wherein concurrent jurisdiction exists between these two agencies as occurs from mean high water to 1,000 feet into the Atlantic Ocean.

Cultural Resource Management

Under this alternative, the Seashore's management emphasis would continue to be primarily on cultural resources on federal lands, particularly at the Fire Island Light Station, the Carrington Estate and the William Floyd Estate. The NPS would rehabilitate or restore cultural resources based on the highest Seashore priorities and would continue efforts to identify, manage, and protect submerged and other archeological resources. Seashore collections would continue to be housed in the existing curatorial storage facility located at the William Floyd Estate.

It is important to note that a separate set of management alternatives has been prepared for the William Floyd Estate and appears at the end of this

chapter. While there may be an occasional reference to cultural resource management at the William Floyd Estate, this section considers primarily the cultural resources associated with Fire Island.

Fire Island Light Station

The NPS would continue to preserve and interpret the Fire Island Light Station through a cooperative agreement with the Fire Island Lighthouse Preservation Society (FILPS). The treatment period for the light station would continue to be ca. 1939 as recommended in the 2004 Historic Structures Report. The recently built Fresnel Lens building (opened in 2011), which houses the original 1858 Fresnel Lens that once illuminated the Fire Island Light, would also be maintained and interpreted by FILPS.

Carrington Estate

The NPS would work collaboratively with local conservation and preservation interests to rehabilitate and adaptively reuse the main house and cottage on the property for administrative purposes. The associated landscape would be rehabilitated to the degree necessary to ensure safe circulation on the property and access to the structures.

Archeological Resources

The NPS would continue to identify, manage, and protect submerged and terrestrial archeological resources on an opportunistic basis beyond basic compliance with Section 106 of the Historic Preservation Act, as amended.

As submerged cultural resources are revealed by erosion, efforts would be made to document and protect these sites and artifacts.

The lack of information about prehistoric resources associated with Fire Island has been expressed in more than one cultural resources analysis prepared for the Seashore. Research to learn more about the prehistoric resources that may be associated with Fire Island could be carried out opportunistically over time. To facilitate this, the NPS would develop a predictive model and testing strategy to record prehistoric resources within the Seashore.

Ethnographic Resources and Associations

The NPS would seek to establish an enhanced working relationship and regularly consult with the Shinnecock Indian Nation, a federally recognized tribe concentrated on eastern Long Island, and the Unkechaug Nation, a state-recognized tribe having a well-known, historic association with Fire Island and the William Floyd Estate.

Museum and Archival Collections -- Curatorial Storage

Beyond the large collection of artifacts and archival materials displayed in the main house at the William Floyd Estate, the Seashore houses segments of its collection at the dedicated curatorial storage facility (erected in 1996) located at the William Floyd Estate, at visitor facilities on Fire Island, and at Seashore headquarters in Patchogue. In addition to museum artifacts and archival materials, the NPS also maintains collections of archeological materials, natural history specimens, and architectural elements. The Seashore collection continues to grow. The NPS would continue to house the museum and archival collections in their present locations. The Seashore's curatorial storage facility would continue to function at capacity. Seashore staff would continue to offer limited tours of the curatorial storage facility as feasible and would continue to provide assistance to researchers. Workspace for conservation and research activities would continue to be limited.

Shoreline Management

▸ FIRE ISLAND INLET TO MONTAUK POINT (FIMP) REFORMULATION STUDY

As discussed in Chapter One, the U.S. Army Corps of Engineers (USACE) has been engaged in an effort to reformulate plans for shoreline management, including storm damage reduction along five reaches of the south shore of Long Island between Fire Island Inlet and Montauk Point, a distance of approximately 83 miles. To date, the reformulation plan has not been completed and approved.

Consistent with the Seashore's enabling legislation, any plan developed for this area that involves erosion control and beach nourishment must be mutually acceptable to the United States Secretary of the Army and Secretary of the Interior. The USACE and the DOI have arrived at a Tentative Federally Supported Plan (TFSP) that outlines an approach that appears to meet the Federal agency objectives and requirements necessary for mutual acceptability. Under the no-action alternative, the Seashore would continue to follow the Tentative Federally Supported Plan and would continue to participate in the USACE's development of the FIMP Reformulation Plan, which would then become the guiding document when completed and approved. The primary tenets of the TFSP are summarized below.

Barrier Island Processes

The NPS would work with others to protect, restore, and emulate the natural processes of Fire Island to the greatest degree possible. These natural processes include the transport of sand by waves, currents, storms, and wind. The NPS would evaluate opportunities and establish a strategy to permit natural processes to proceed, especially on the major federal tracts.

Beaches and Dunes

NPS acknowledges a need to transition from the current practice of beach nourishment to a more natural (dynamic) beach and dune system. Emphasis would be placed on land-use management and non-structural means to restore dynamic beach and dune processes; however, beach nourishment in front of the 17 communities would be allowed over the life of the FIMP shoreline management plan subject to adaptive management considerations and local land-use regulations. Compliance requirements would include a programmatic environmental impact statement (EIS) to consider the broad impacts of beach nourishment on Fire Island with more detailed environmental assessments (EAs) being prepared to address and evaluate the impacts of specific projects.

Ocean Sediment Transport

Ocean sediment transport processes are important for maintaining beach and dune development as well as cross-island sediment transport processes. Sediment bypassing at Moriches Inlet and tapering of the groins at Ocean Beach would be initiated. The practice of beach scraping would cease upon adoption of FIMP. Although NPS would continue to allow removal of sand from near-shore borrow sites, recent scientific investigations suggest that these offshore sand resources may be a significant source of sand coming into the Fire Island sediment transport system. Removal of sediment from these sources must be accompanied by a monitoring program to detect increased erosion as well as an adaptive management plan that would allow for a change in the sand removal program if negative impacts are detected.

Bay Side Sediment Transport

Bay side sediment transport processes shape the estuarine shoreline as a mosaic of narrow sandy beaches, tidal creeks, mud and sand tidal flats, salt marshes, and eelgrass beds that can buffer the upland from attack by waves. On the bayside, a variety of erosion control measures would be considered acceptable within the Seashore, but the NPS would work with USACE and NYS to mitigate the impacts of bulk heads and promote resource-sensitive and environmentally sustainable alternatives. NPS would permit in-place and in-kind replacement of bulkheads per NYS DEC regulations. NPS would work with partners to pursue opportunities to restore bay side sediment transport processes through regional sediment management, softening of shorelines, and other alternatives that are generally consistent with NPS policies.

Routine maintenance (e.g., dredging) of navigation channels to Sailors Haven, Watch Hill, Talisman, and specific Fire Island communities would be planned to maximize opportunities to return dredge sediment to bay side sediment transport systems.

Cross-Island Sediment Transport (CIST)

Cross-Island Sediment Transport (CIST) is the wind-, wave-, current-, and storm-driven movement of sand back and forth across the barrier island between offshore bars, beach face, berm, dune, island core, bay shore, and bay. CIST processes are important for maintaining the diversity of barrier island habitats and long-term geomorphology of a barrier island. As part of the transition to a more dynamic beach and dune system, pre-breach maintenance and management that reduces CIST will be allowed in front of the 17 communities over the life of FIMP. A breach response plan would be developed to provide for closure of breaches that would affect a Fire Island community. The plan would provide a protocol for breach management decision making and monitoring to ensure that manipulation of breaches within the remaining public tracts occurs only as necessary for public safety.

It is expected that FIMP will address breach management throughout the 83-mile project area. Although the Tentative Federally Supported Plan (TFSP) identifies the following elements that pertain to breach management, the FIMP EIS will consider all alternatives for breach management.

- A breach is defined as a continuous exchange of water between the ocean and bay at low tide.
- No new permanent inlets would be allowed to form.
- Closure of breaches would generally occur within 90 days.

- Closure of any breach that occurs from the eastern boundary of Robert Moses State Park through Point of Woods and in the communities of Cherry Grove, Fire Island Pines, Water Island, and Davis Park would begin within 45 days of the breach.
- Breaches within the five major federal tracts will be monitored and if such a breach does not close naturally within 45 to 60 days, then a Science Response Team would advise decision makers for conditional closure.

Seek effective enforcement of Coastal Erosion Hazard Area (CEHA) Act

The NPS would work with state and local agencies to ensure that the CEHA on Fire Island is updated and enforced when developments that are inconsistent with the CEHA are proposed.

Seashore Experience

Under this alternative, the Seashore experience would remain somewhat segmented, with visitors to Seashore facilities largely staying within those facilities and visitors and local residents of communities largely staying within their individual communities. Current efforts to raise awareness of the presence of the Seashore would continue. The NPS would continue to offer a broad slate of visitor programs at selected locations on a limited schedule as funding and staffing permit. The Seashore's informational website, exhibits, social media presence, brochures, and other publications would continue to be available.

Interpretive Emphasis

Under this alternative, the interpretive emphasis would continue to focus on raising awareness of and the development of an appreciation for the unique qualities of Fire Island and how future human activity may affect its resources.

Public Information and Programs

The Seashore would continue to maintain a robust web page on the NPS website (www.nps.gov/fiis) that provides information on Seashore programs, recreational opportunities, resources, and management. Ranger-, partner-, and volunteer-led programs would continue to occur primarily during the summer visitor season at Sailors Haven and Watch Hill and are offered on a regular basis year-round at the Lighthouse, Wilderness Visitor Center, and the William Floyd Estate. The Seashore's website, social media presence, and print media would continue to be the primary vehicle for delivering a wide range of information including general park orientation, specific site information, and public safety.

Educational & Community Outreach

The NPS would continue to offer a limited number of educational and community outreach programs that would be available upon request and dependent upon the availability of resources.

▸ VISITOR FACILITIES

Under this alternative, the NPS would continue the present use of existing facilities that generally meet visitor needs. Existing structures would be maintained, repaired, and rehabilitated as funding becomes available and in accordance with existing plans and analysis, and the overall needs of the Seashore. The NPS would construct new facilities in accordance with existing plans as construction and operations funding becomes available. Any proposed new visitor facilities development, rehabilitation, or post-storm reconstruction would be undertaken only after appropriate climate change and sea-level rise risk assessments have been completed. A more detailed examination of these factors will influence the type, design, location, and ultimate feasibility of any proposed project. With the exception of the Fire Island Light and the Wilderness Visitor Center, which are open year round, the rest of the visitor facilities described below are open to the public for regular operating hours during the visitor season from late spring to early fall. Special programming may occur at these locations throughout the year.

Patchogue/ Mainland Facilities

The Ferry Transportation Center (opened in 2010) with ferry service to the Seashore's Watch Hill facility would continue to serve the public with restrooms, a multipurpose program space, outdoor orientation exhibits, and 188-space parking lot. The Ferry Transportation Center is within walking distance of local bus and train service.

Fire Island Light Station

The Fire Island Lighthouse Preservation Society (FILPS) would continue to operate the site offering tours and access to the lighthouse, exhibits, and gift shop on a year-round basis. The Fresnel Lens building would also continue to be open to the public and staffed by FILPS volunteers.

The Fire Island Light Station is one of the few sites associated with the Seashore that is accessible by vehicle. Visitors arriving by car would continue to park at Field 5

at Robert Moses State Park and walk to the Lighthouse using the existing system of boardwalks. School bus parking would be available at Field 5 with a drop-off area located at the Lighthouse. A Ranger Station, staff housing, and seasonal restrooms would also continue to be located in the Lighthouse Annex.

The NPS would retain the existing West End Entrance Station and restroom located at the east end of the Robert Moses Causeway.

Sailors Haven/ Sunken Forest

The NPS would retain the 45-slip marina, ferry dock, visitor center, and the current system of boardwalks and walkways that permit access to the Sunken Forest, ocean side beach, and other visitor amenities. The Seashore would continue to operate the facility as a "clean marina" consistent with standards suggested by the NOAA Office of Ocean and Coastal Management's Clean Marina Initiative. The NPS would rehabilitate the Sailors Haven Visitor Center to include the replacement of existing exhibits and sales space as funds become available. The marina, restrooms, general store, snack bar, and picnic area would continue to be operated through a concessions agreement awarded through a competitive process to a private enterprise. The NPS would continue to staff the beaches with lifeguards, provide ranger-led interpretive and educational programming, operate the First Aid station, and maintain the bathhouse and restroom facilities, boardwalks, and walkways.

Talisman

The Talisman area would remain a protected ocean beach with lifeguard service limited to weekends during the regular visitor season as funding is available. Primary public access to this area is by foot, private boat, or by chartered ferry or water taxi. The NPS would continue to maintain existing facilities including the boat dock, bathhouse, restrooms, boardwalks, and picnic area. A bulletin board and waysides would continue to provide relevant information to visitors to the area. Occasional ranger-led interpretive programming would be offered as funding permits.

Watch Hill

Watch Hill would remain the Seashore's most intensely developed destination, offering a variety of services and facilities including the ferry dock and 188-slip marina, general store, snack bar, restaurant, and bar. The Watch Hill marina would also continue to be operated as a "clean marina" consistent with guidance provided by the NOAA Office of Ocean and Coastal Management's Clean Marina Initiative. The marina facilities, campground, and the Dune Station/ bathhouse would continue to be operated through a concessions agreement awarded through a competitive process to a private enterprise. The formal reservation system currently in place for the marina and campground would continue. The NPS would continue to staff the public beach with lifeguards and would also staff the visitor center, which would continue to offer a visitor desk, limited orientation and interpretive exhibits, and a small sales area currently stocked by a cooperating association, Eastern National, and the extensive system of boardwalks through the maritime forest and salt marsh. The NPS would rehabilitate the Watch Hill Visitor Center to include the replacement of existing exhibits and sales space as funds become available. Wilderness camping permits would continue to be issued at this location, as it would continue to serve ranger-led interpretive and educational programming. An on-line permitting and reservation system became operational in 2013. The Friends of Watch Hill would continue to maintain certain recreational improvements to the marina made by the organization (e.g., Bocce ball court).

Wilderness Visitor Center

The Wilderness Visitor Center would continue to serve as the eastern gateway to the Fire Island Wilderness offering a visitor contact desk, restrooms, exhibit space, and a small sales area currently stocked by Eastern National. The facility would be staffed by Seashore staff and volunteers and would continue to serve as a station for informal visitor contact, interpretive and educational programming, and issuing permits for backcountry camping, sportsman ORV, and hunting. This would continue to be the primary point of entry for recreational vehicular beach access. As noted above, an on-line permitting and reservation system became operational in 2013.

Public Non-Federal Facilities

Atlantique Beach, Leja Beach, Smith Point County Park, Bellport Beach, and Great Gun Beach are the five official municipally owned beaches on Fire Island. Additionally, Robert Moses State Park is located on Fire Island west of the Seashore's boundary. Local jurisdictions would continue to own and manage their respective areas within the Seashore boundary. The NPS would work collaboratively with the owners and operators of these properties to ensure consistency of resource management goals and coordination of actions.

Old Inlet

The visitor facilities located at Old Inlet, including the boardwalk, vault toilet, and boat dock, were lost when Fire Island was breached during Hurricane Sandy in 2012 and will not be reconstructed.

▸ RECREATIONAL USES

The Seashore would continue to provide the venue for a wide range of recreational activities including but not limited to beach combing, bird watching, boating, camping, fishing, hiking, hunting, interpretive programming, volunteering, citizen science, nature walks, photography, star gazing, swimming, surfing, wilderness camping, and wildlife viewing. The following recreational uses were identified during the project scoping phase as areas that may be subject to change from current practices.

Life Guarded Beaches

The NPS would continue to provide lifeguards seasonally at the Sailors Haven, Talisman, and Watch Hill ocean beaches as funding permits. Hours of life- guarding operations at the protected beaches would be determined based on the level of visitor use and consistent with existing policies and guidelines for visitor safety.

Beach Camping in front of the Wilderness Area

The NPS would continue to permit backcountry camping on the beach in front of the Fire Island Wilderness. In practice, this would not expand the total number of people camping in the Wilderness Area and on the beach combined; it simply offers the same number of permittees currently allowed in the Wilderness the option of camping in the Wilderness Area or on the beach. Under this alternative, this practice would continue under the following conditions:

- No more than 36 people may camp in the Fire Island Wilderness zones and the Great South Beach zones combined.
- No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern Zone.
- No more than 24 individuals in no larger than groups of 8 per campsite in the Western Zone.
- Camping on the beach would be permitted annually from March 15 through Labor Day.

Kayaking/Canoeing

The NPS would continue to offer a guided canoeing program at Watch Hill during the summer, when staffing and conditions permit providing an opportunity to explore and appreciate Fire Island's most extensive salt marsh, skirting the northern boundary of the Fire Island Wilderness.

Recreational ORV use

The NPS would continue to allow the use of recreational off-road vehicles (ORVs) at certain times on Fire Island's ocean beach from west of the Wilderness Visitor Center (at Smith Point) to Long Cove (approximately 6 miles) as a means of access for fishing, hunting, or other recreational activities between September 15 and December 31 as conditions permit. In 2012, Hurricane Sandy caused a breach that has affected recreational driving and will continue to do so until the breach closes either naturally or by mechanical means. This activity would continue to require a Sportsman's Vehicle Permit.

Vehicles would not be allowed in the designated Fire Island Wilderness.

Land Use and Development

Land-Use Regulation of Properties within the Community Development District

Under this alternative, land use and development within the Community Development District would continue to be guided by existing local plans and regulated by local zoning as adopted by the towns of Islip and Brookhaven and the villages of Ocean Beach and Saltaire, as consistent with the 1991 Secretary's zoning standards. All parties would continue to rely on the NYS CEHA Act as applied by state and local authorities.

The NPS would continue to review applications for variances, exceptions, permits for commercial or industrial use, or special permit submitted to the zoning authority and provide a written response indicating whether the proposal conforms to the Secretary's zoning standards or the purposes of the Seashore's enabling legislation. Frequently the findings and recommendations of the Seashore are not wholly considered by the local zoning authorities, and developments that are not in compliance with the Secretary's zoning standards have been granted variances and permitted by local jurisdictions. The only tools available to the NPS in the event of a non-conforming action would be to revoke the Secretary's suspension of his or her condemnation authority or to seek condemnation of the property, if the inconsistency is considered to be sufficiently egregious and funds can be appropriated for such condemnation. The use of condemnation authority as a tool for controlling development has not been used on Fire Island since the 1970s for lack of financial and political support.

Transportation

▸ LAND-BASED ACCESS

Public Transportation

Public transportation access to Fire Island would continue through the existing network of public transit, bus, and ferry service. The Long Island Railroad would continue to provide access for visitors to the mainland ferry terminals via a short walk, cab, or bus ride. Public bus service currently connects the Babylon train station to Robert Moses State Park (RMSP) during the summer. There is also currently summer bus service from the Mastic/Shirley train station to Smith Point County Park (SPCP), which would also serve the Fire Island Wilderness and the Wilderness Visitor Center. The Fire Island Light Station, the Wilderness Visitor Center, and the William Floyd Estate would continue to be accessible for school groups by school bus.

Private Vehicle

In general, access to Fire Island by private vehicle would continue to be limited. Visitors arriving by private vehicle would continue to be able to park for a fee in either the Robert Moses State Park lot on the west end of Fire Island with pedestrian access to Fire Island Light or the Smith Point County Park lot on the east end of Fire Island with pedestrian access to the Wilderness Area and the Wilderness Visitor Center. A small number of handicapped spaces would continue to be available in closer proximity to the Fire Island Light and at the Wilderness Visitor Center. Private vehicles would not be allowed past these parking areas without a permit.

Roadless Island

The NPS would work with Fire Island communities, the towns of Islip and Brookhaven, Suffolk County, New York State, and others to manage Fire Island's transportation system in a manner that supports a roadless environment where driving is kept to a minimum, except at designated areas on Fire Island's east and west ends.

Bicycles

On Long Island, the Patchogue Ferry Terminal and the William Floyd Estate are accessible by bicycle via existing public roads. Bicycle racks are available at each of these locations. On Fire Island, there would continue to be no through recreational bicycle trail linking Seashore facilities. Bicycles would continue to be allowed on federal tracts where and when vehicles are permitted. Bicycles would continue to be used during certain times of the year by workers for transportation to and from Fire Island job sites. In addition, bicycles would continue to be used by Fire Island community residents consistent with the rules and restrictions imposed by each community.

On-Island Vehicle Access

Limited driving is permitted on Fire Island but is strictly regulated to protect Fire Island's natural resources, the roadless character, and its communities. Driving permits are available to a limited number of year-round and part-time residents, a limited number of contractors. NPS grants fleet permits to the water, phone, and electric utilities; essential service permits for garbage haulers; and municipal permits to municipal or Fire Island community employees. NPS also can grant special permits on a case-by-case basis for temporary uses, such as access to Fire Island during ice-over conditions when ferry service is suspended.

▸ WATER-BASED ACCESS

Private Boaters

Slips at Sailors Haven would continue to be available on a first come, first served basis. The reservation system at the Watch Hill marina would continue. The NPS would continue to impose a 14- consecutive- day limit on all overnight stays in Seashore marinas at Sailors Haven and Watch Hill. Boats would continue to be able to drop anchor off shore.

Lateral & Cross Bay Ferry Service

In recognition of the importance of the roadless character of Fire Island, the Seashore would continue to work with other Fire Island stakeholders to manage ferry service to ensure that it continues to provide a quality experience and remains the primary form of transportation to and from Fire Island. The NPS would require that ferries serving Seashore destinations be more sustainable (e.g., reduced emissions, use of alternative fuels, etc.) and encourage Fire Island communities to do the same with their ferry operators.

Navigation

Aids to navigation and navigation channels would be maintained by NPS at Sailor's Haven, Watch Hill and Talisman, as appropriate. Moriches and Fire Island Inlets would continue to be dredged, as would the Intracoastal Waterway and navigation channels that serve the Seashore and Fire Island communities by the USACE and Suffolk County (respectively).

Operations & Maintenance

Seashore Headquarters & Main Maintenance Facility – Patchogue

The NPS would continue to concentrate its administrative, operations, and maintenance functions on the Patchogue River within the village of Patchogue.

Currently, the Seashore's administrative offices are dispersed across two locations, with the Superintendent and several division chiefs housed at Laurel Street. The interpretive staff offices, the maintenance division, the park planner, and some resource management staff are located at the nearby Patchogue Maintenance Facility (PMF) and Administrative Annex on West Avenue.

At PMF, the NPS maintains the riverfront bulkhead and piers for docking boats, a warehouse for storing materials and equipment, storage for fuel and hazardous material, workshop, and office space. A small building on the site, the River Room, provides dedicated meeting space. The Patchogue Ferry Terminal is also available for administrative purposes (e.g., staff training, public meetings, etc.).

As funding becomes available, these facilities would be updated and, where necessary, rehabilitated, to address environmental concerns (e.g., storm water drainage, energy efficiency, etc.), the impacts of climate change and sea-level rise, and consistency with the Americans with Disabilities Act (ADA). The consolidation of administrative facilities into a single location would also be considered.

Satellite Maintenance Facilities

The NPS would continue to maintain a number of small satellite maintenance facilities to support remote operations on Fire Island and at the William Floyd Estate. The Fire Island facilities are largely used during the spring, summer, and fall, and shut down over the winter. These facilities would continue to provide modest workshop space, storage for materials and fuel, and seasonal workspace for Seashore staff. These facilities would continue to be dispersed across Fire Island at: Fire Island Light Station, Sailors Haven, and Watch Hill. The maintenance facility at the William Floyd Estate is discussed in greater detail in the next section.

Boat & Ferry Docks

The NPS would continue to maintain a number of boat and ferry docks to facilitate public access and Seashore operations. Boat and ferry docks would continue to be located at the Ferry Transportation Center in Patchogue, Watch Hill, Talisman, Sailors Haven, and at the Fire Island Light Station. Boat docks at the Seashore's administrative headquarters and at the Patchogue Maintenance facility would also continue to be maintained for official use.

Carrington Estate

The NPS would continue to work with local conservation and preservation interests to rehabilitate and adaptively reuse the main house and guest cottage on the Carrington Estate consistent with the Seashore's purpose and management goals and as funds become available. Visitor access to the property could be limited depending upon the ultimate use selected for the structures.

Staff Housing

Under this alternative, the NPS would continue to maintain and make housing available to Seashore and concession employees for rent at fair market rates. Seashore housing would also continue to be available to researchers on an as- needed basis. Seashore -owned housing would continue to be dispersed throughout the

park, with the largest number (12 units) being located at Watch Hill. Other housing locations would continue to include Fire Island Light Station (7 units), Sailors Haven (3 units), Talisman (2 units), and the William Floyd Estate (2 units).

Marine Vessels
The NPS would continue to maintain a fleet of work and patrol boats. As vessels are replaced, the Seashore would ensure that vessels coming into the fleet meet the best available standards for energy efficiency and environmental sustainability, as available funding permits.

Trash Transfer Stations/ Waste Management
Concessioners would continue to operate garbage transfer stations and recycling at Sailors Haven and Watch Hill using buildings assigned to them for that purpose. The NPS would continue to cart refuse off Fire Island by vessel. Other federal areas throughout the park would continue to be "carry in/carry out" areas.

Ranger Stations
Ranger Stations would remain in their current locations – the Lighthouse Annex on the Lighthouse tract, the visitor center at Sailors Haven, the maintenance facility at Watch Hill, and the Wilderness Visitor Center.

Lifeguard Facilities
Lifeguard facilities include changing room, showers, lockers, and storage for gear and would continue to be located at Sailors Haven and Watch Hill.

Fire Island Light Station Operations/Kismet Fire House
The structure is currently leased to the Kismet Fire Department through 2014 and is presently used for storage and public restrooms. Upon expiration of the lease, the NPS would consider the structure an extension of the Fire Island Light Station in planning for its long-term use.

"Greening" Park Operations & Facilities
Overall the NPS would work internally and in partnership with cooperators and concessioners to improve much of the Seashore's existing infrastructure and refocus, rebuild and reorient the facility management program to make it more sustainable and operationally efficient. Where appropriate, the NPS would work to consolidate facilities and ensure that they are in the most suitable location and meet needs and requirements in accordance with each facility's function. Whenever feasible, the NPS would strive to ensure all Seashore structures, facilities, vehicles, and equipment showcase the principles of sustainability within a dynamic coastal environment and serve as a model to others. Facilities would be evaluated and upgraded as appropriate in the context of their regular maintenance cycle and consistent with NPS "Green Park" and facility management standards, and factors related to climate change and sea-level rise.

Potable Water System
The NPS would address issues associated with remaining park-maintained potable well water systems at Fire Island Light and Talisman to bring them into compliance with federal, state, and local standards through upgrading existing systems or connecting to the Suffolk County Water Authority.

Universal Accessibility
Structures, grounds, and facilities on Fire Island and at the William Floyd Estate are made universally accessible to the greatest degree possible as funds become available. In the event that creating universal access is not feasible, other means (e.g., the use of interpretive media) would be used to accommodate visitors with disabilities.

Fire Safety & Security
The NPS would evaluate existing fire safety and security systems at all Seashore sites and facilities for consistency with existing codes and make any necessary improvements to ensure the safety of visitors, Seashore staff, and collections.

Park Administration

Under this alternative the NPS would continue to operate Seashore facilities and provide for public programming and visitor safety by relying on a combination of NPS staff, volunteers, partners, cooperators, and commercial service providers. Most resource management, land- use planning, zoning, and other regulatory activities would be undertaken by Seashore and other NPS staff.

Cooperative Stewardship
Under this alternative, Fire Island National Seashore would continue to employ various strategies to advance cooperative stewardship of the Seashore's resource values. The Seashore would continue to work with existing laws and authorities to address issues that cross jurisdictions on an ad-hoc and/or case-by-case basis.

Staffing
Under this alternative existing staffing (approximately 57 Full Time Equivalents or FTEs) would be augmented to meet current management demands at the Seashore as funds become available.

Volunteers

The Seashore has a corps of as many as 180 volunteers. It is estimated that volunteers contributed 30,000 hours of labor in FY12 or the equivalent of 15 FTE. Volunteers would continue to participate in many facets of Seashore management including curatorial support, staffing visitor desks, developing and conducting interpretive and educational programming, organizing the Seashore library, collecting natural and cultural resource data, organizing and participating in clean-ups, maintaining Fire Island Light and other facilities, developing exhibits, training other volunteers, engaging in community relations, hosting at the campground, and performing administrative functions.

Partners

The NPS would continue to expand its network of partners and cooperators including existing and emerging Friends groups, academic institutions, federal, state, and local agencies, community groups and associations, etc.

Commercial Services

The NPS would continue to employ concessioners to provide regular ferry service seasonally to NPS visitor facilities on Fire Island and to manage and maintain the public facilities at Sailors Haven and Watch Hill including the marinas, campground, food service, and general stores. The concessions would continue to be awarded on a competitive basis at regular intervals. Seashore staff would continue to be responsible for monitoring the concession to ensure that the terms of the concessions agreement are met.

Cooperators

The NPS would continue to rely on a cooperating association, the Fire Island Lighthouse Preservation Society, to operate and maintain the Fire Island Lighthouse and provide visitor services to the public. The NPS would also continue its relationship with Eastern National (EN), a cooperating association that manages sales outlets at various locations throughout the park including Watch Hill, Sailors Haven, Wilderness Visitor Center, and the William Floyd Estate.

Strategic Plan for Fire Island Light Station

Capital facility development for the Fire Island Light Station is essentially complete. The strategic management emphasis must shift to sustaining visitor services and resource preservation into the future. Working with the Fire Island Lighthouse Preservation Society, the NPS would develop a strategic plan to address the long-term operation and preservation of the Fire Island Light Station complex.

Collaboration in Public Safety & Law Enforcement

The NPS would continue to collaborate with cooperating law enforcement and emergency response agencies on Fire Island to meet public safety needs Fire Island-wide, and to promote the message of stewardship, resource protection, public safety, and a quality visitor experience at the Seashore. The NPS would continue to participate on the Fire Island Law Enforcement, Safety, and Emergency Council (FILSEC), an ad hoc working group that assembles on a regular basis to promote interagency communication and coordination in meeting the needs of public safety and law enforcement on Fire Island.

Land Acquisition

All Seashore District Land as identified in the 1984 Land Protection Plan would be acquired on a willing-seller basis as properties become available, and as funds are appropriated for such purposes.

Improved Properties within the Seashore District

As defined by the Secretary's zoning standards for the Seashore, the Seashore District encompasses all portions of lands and waters within the boundary of the Seashore on Fire Island which are not included in the Community Development District. The intention of the Fire Island National Seashore Act was that all private lands within the Seashore District (except certain "improved properties" built as of July 1, 1963) would eventually be acquired on a willing-seller basis. Continuation of these residential property uses and ownership would be guaranteed as long as they conform to the local zoning authority and the Secretary's zoning standards. Like the properties in the Community Development District, private properties in the Seashore District would continue to be subject to local, state, and federal environmental regulatory controls. The Seashore's 1984 Land Protection Plan outlined the goals for protection of lands within the boundary of the Seashore, including the private properties owned in the Seashore District, reiterating the long-term goal of acquiring all private parcels in the Seashore District based on a willing seller and the availability of funds for land acquisition. Upon acquisition of a property, structures and other improvements would be removed and the land would be permitted to return to a natural state.

Park Boundary

Boundary Demarcation

The NPS would take steps to reduce encroachments onto and provide better protection of the Seashore's federal lands (e.g., provide additional markers to clearly identify Seashore boundaries both landward and seaward) and to ensure that the Seashore's seaward boundary is noted on National Oceanic and Atmospheric Administration (NOAA) charts in print and digital formats.

The NPS would work to rectify the boundary with Suffolk County at Smith Point County Park and pursue formal survey of the 100-square-foot parcel on which the Wilderness Visitor Center sits.

Legislative Requirements

There are no legislative requirements related to Alternative 1 – Continuation of Current Management Practices.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

This section outlines proposed management objectives that would be considered to be common to all action alternatives. Seashore managers would strive to achieve the objectives outlined below regardless of which alternative is ultimately implemented. The common objectives highlight the resource conditions, park experiences, and cooperative efforts that are of overall importance to the management of the Seashore.

Actions that may be taken in association with management objectives that are common to all action alternatives could differ between alternatives and would be represented accordingly.

In addition to the elements described below, a number of current practices described under Alternative 1 – Continuation of Current Management Practices (No Action) would generally continue regardless of the management alternative ultimately adopted as a result of this process.

These current practices include:

Natural Resource Management

- Resource Stewardship Planning
- Threatened & Endangered Species Planning, Monitoring, and Protection
- Management of Native Plant and Animal Species
- Tick Surveillance and Management
- Resource Stewardship – Public Education and Outreach
- Management of Non-native Invasive Plant and Animal Species
- Enhancing opportunities for observing the natural night sky
- Protecting Freshwater and Saltwater marshes

Cultural Resource Management

- Research and documentation of federal cultural properties on Fire Island
- Development of a predictive model and testing strategy to record prehistoric sites within the Seashore
- Documentation and protection of submerged archeological sites revealed by erosion
- Establishment of enhanced working relationships with the Unkechaug Nation and the Shinnecock Indian Nation
- Maintenance of the Seashore's museum and archival collections in good condition and work to make them more readily available to the public

Shoreline Management

- Subscription to the tenets of the Tentative Federally Support Plan (TFSP) for the Fire Island to Montauk Point (FIMP) Reformulation Study

Seashore Experience

- Continuation of Recreational Off- Road Vehicle (ORV) use as a means of access for fishing, hunting, and other recreational activities as currently prescribed
- Operation of marinas consistent with NOAA Office of Ocean and Coastal Management's Clean Marina Initiative

Transportation

- Collaboration with others to support a roadless environment on Fire Island where driving is kept to a minimum
- Continued regulation of vehicle access on Fire Island
- Collaboration with others to ensure that water-based transportation remains the primary form of access to Fire Island
- Maintenance of aids to navigation and navigation channels

Seashore Maintenance and Operations

- Rehabilitation of the Seashore's administrative facilities to address environmental concerns and operational inefficiencies
- Retention of satellite maintenance facilities on Fire Island
- Maintenance of a fleet of work and patrol boats, replacement of vessels to meet best available standards
- Maintenance of boat and ferry docks at NPS facilities
- "Greening" of park operations and facilities
- Ensuring Potable Water System at NPS facilities complies with federal, state, and local standards
- Ensuring that NPS facilities are universally accessible to the greatest degree possible
- Provision of staff housing to meet operational needs
- Commitment to cooperative stewardship
- Expansion of network of partners and cooperators
- Collaboration with the Fire Island Lighthouse Preservation Society to prepare a Strategic Plan for the Light Station
- Acquisition of Improved Properties in the Seashore District as identified in the 1984 Land Protection Plan
- Demarcation of the Seashore's landward and seaward boundaries

Resource Management in General

Encourage Greater Scientific & Scholarly Research

The NPS would develop a coordinated, comprehensive research and monitoring program to better understand and manage the broad range of natural and cultural resources within the Seashore's boundaries, particularly in the context of climate change, and would consider strategies for adaptive management. The research program would include both land- and marine-based resources, and the Seashore would become a setting for scientific and scholarly research related to cultural and natural resources. Working with the North Atlantic Coast Cooperative Ecosystem Studies Unit (CESU) and other CESUs within the national network as appropriate, the NPS would encourage greater scientific and scholarly research to enhance understanding of park resource values and processes and to support the Seashore's natural and cultural resource management needs in a number of ways.

Support for these efforts might include:

- providing housing for researchers or sponsoring a researcher-in-residence type program;
- providing staff assistance;
- working through Eastern National or others to co-publish major reports and studies for public consumption;
- creating and managing a virtual Seashore library making NPS and its partners' products available at no cost to stakeholders via the Internet; and
- sponsoring public forums and lectures to make research findings more accessible.

Expand Opportunities for Public Involvement in Research & Scholarship

At the Seashore the NPS would expand opportunities for the public to support research and scholarship through participation in hands-on programs such as "Citizen Science." The NPS would work collaboratively with park stakeholders to develop programs and activities that encourage individual stewardship of *natural and cultural resources* including engaging in sustainable practices, taking actions to eliminate or reduce the spread of invasive species, and participating in the documentation of the cultural heritage on Fire Island and at the William Floyd Estate. Programs and activities would emphasize public education and would encompass research, monitoring, and the adoption of best management practices.

Catalogue of Natural and Cultural Data and Research Needs

The NPS would develop a catalog of the Seashore's natural and cultural data and research needs and make it available to researchers, universities, and other educational entities. The NPS would identify and prioritize research needs and make resources available to encourage research that directly assists NPS managers in their efforts to better understand the Seashore's natural and cultural resources and support resource protection actions.

Model Best Management Practices

The NPS would model "best management practices" at the Seashore for activities like energy and water conservation, and wastewater management on federal lands and work with others to encourage "best management practices" for activities Fire Island-wide, including the development of demonstration projects to pilot new ideas and broadly share results.

The NPS would work with Fire Island communities and homeowners to adopt a number of methods that would discourage certain species associated with health risks (e.g., mosquitoes, raccoons, etc.). Such actions could include the installation of skirting on the undersides of buildings to eliminate attractive shelters, the storage of garbage in enclosed sheds, etc.

The NPS would advance educational programming that defines the principles of sustainability and adaptive management and how they have been adopted and applied within the National Park System. This programming would target Seashore staff, partners, community residents, and the general public.

Natural Resources

Terrestrial Resources

▸ SUNKEN FOREST & OTHER MARITIME FORESTS

The approximately 40 acre Sunken Forest is located within the Sailors Haven federal tract between Oakleyville (to the west) and Cherry Grove (to the east). It is a globally rare holly maritime forest and is specifically identified in the Seashore's enabling legislation. A series of studies concluded that since 1967 heavy deer browse has altered the composition of the forest. Further,

accelerated bay shore erosion associated with the disruption of sediment transport processes adjacent to the Sailors Haven marina is also contributing to the loss of this globally rare forest community.

The NPS would work to create conditions for regeneration of native vegetation in the Sunken Forest and other similar maritime forests on Fire Island. Depending upon research recommendations, options could include restoration via native re-vegetation, reducing deer populations, or large-scale fencing.

Restoration of Native Vegetation

The NPS would maintain the character of the maritime forest by ensuring the regeneration of key canopy constituent tree species and a reasonable representation of herbs and shrubs reminiscent of its floristic composition when the Seashore was established.

Long-Term Monitoring Program

Efforts to restore the Sunken Forest would include a monitoring strategy that allows for adaptive management. Management practices would be reevaluated periodically to ensure that they continue to be sound given the dynamic character of Fire Island (e.g., periodic storms, unchecked erosion, climate change, etc.).

▸ THREATENED & ENDANGERED SPECIES

Research on Human Impacts

The NPS would undertake the necessary research to better understand and manage for the impact of human disturbance on T & E species at the Seashore.

▸ NATIVE PLANT & ANIMAL SPECIES

Addressing the Effects of Climate Change

As climate change affects the composition of native species within the Seashore (e.g., range expansion), Seashore staff would work with research partners and others to monitor and evaluate the effects of climate change and identify appropriate strategies for addressing them.

▸ NON-NATIVE INVASIVE PLANT & ANIMAL SPECIES

Non-native Invasive Plant and Animal Species Management Plan

The NPS would develop a comprehensive non-native invasive species management plan for the Seashore that addresses prevention, monitoring, and management priorities. Consistent with the Seashore's overall management approach, educational programs, media, incentive programs, and other outreach methods would

be used to garner assistance in this effort from Fire Island communities and other private and public entities.

▸ WATER RESOURCES

Wastewater Management Plan

In collaboration with the US Geological Survey (USGS), Suffolk County, the towns of Brookhaven and Islip and Fire Island communities, the NPS would initiate a Fire Island-wide process to evaluate the issues and impacts associated with the present state of wastewater on Fire Island on both federal and non-federal lands, outline a range of possible alternatives for addressing them, and develop a cooperative implementation strategy to address the issues identified.

▸ NATURAL SOUNDSCAPE

Soundscape

The combination of physical sound resources, or soundscape, at a particular location makes up what is known as the acoustical environment. The soundscape could include both natural sounds (wind, waves, wildlife, vegetation) and cultural and historic sounds (glasses clinking, tribal ceremonies, quiet reverence). The Seashore exists within the metropolitan New York area and is subject to many urban sounds (e.g., crowds at some locations, boat motors, aircraft, etc.). The NPS would undertake an evaluation of the Seashore's acoustic environment and explore opportunities to minimize the sounds of modern society throughout the Seashore as feasible and appropriate.

Marine Resources

▸ OCEAN AND ESTUARINE RESOURCES

Recent NPS initiatives have called for enhanced marine resource stewardship. In response to the President's Ocean Action Plan, in June 2007 the NPS issued an Ocean Park Stewardship Action Plan aimed at enhancing efforts to protect and restore the natural and cultural resources of national park system marine ecosystems. The NPS Northeast Region went on to develop a Northeast Region Ocean Park Strategic Plan to enhance knowledge of marine resources within parks in the Northeast Region, identify strategies for protection and restoration, foster partnerships with those engaged in ocean stewardship, and engage visitors in ocean stewardship (June 2007). The 1977 Seashore GMP, published over three decades ago, made little mention of submerged marine resources within the Seashore boundary. The new NPS initiatives now call for coastal parks to address marine resource issues.

Marine Research and Monitoring

The NPS would work collaboratively with partners of the North Atlantic Coast CESU, the NPS Northeast Coastal and Barrier Monitoring Network, the South Shore Estuary Reserve Council, and others to foster academic research, programming, and data sharing related to marine resources in the Great South Bay and nearby waters of the Atlantic Ocean. The research program would address the development of maps and baseline data for natural and cultural resources, periodic trend analysis, and evaluation of changes in resource conditions. Monitoring would be designed to detect significant changes in marine resources (e.g., water quality) and used to inform both management and research. The NPS would engage in partnership opportunities at the Seashore among federal, state, and local agencies and non-government organizations to enhance marine resource research, monitoring, conservation, and education, with particular emphasis on waters within the Seashore's boundary, acknowledging the larger context of these resources in the Great South Bay and Atlantic Ocean.

Understanding fisheries

The NPS would assess fishing (finfish and shellfish) activity occurring at the Seashore (both recreational and commercial). Commercial fishing would be assessed in light of the prohibition at 36 CFR § 2.3(d)(4). Information would be gathered on where, how, and when fishing occurs, coupled with information on the catch (e.g., species harvested, number harvested, size, fishing gear/methods, etc.). Design of the fisheries information program would be in collaboration with state and local marine fisheries managers to ensure that the information will contribute to overall knowledge of marine resource sustainability within the Seashore's waters and the region. Particular emphasis would be placed on understanding how recreational fishing and marine resources within the Seashore's boundary contribute to visitor education, inspiration and enjoyment. Management of fishing will be addressed in the Marine Resources Management Plan or a subsequent Action Plan.

Marine Resources Management Plan

The NPS would work with others having jurisdictional authority to address both natural and cultural marine-based resources to develop a Marine Resources Management Plan for submerged lands and shared

resources of the Seashore. The Marine Resource Management Plan would define NPS roles and priorities and would recommend collaborative management strategies to promote the long-term protection and sustainability of marine resources within the larger contexts of Great South Bay and the Atlantic Ocean. The Marine Resources Management Plan would address issues pertinent to fishing and shellfishing, the protection of submerged aquatic vegetation, the protection of submerged archeological resources, and the management of operational and recreational activities (e.g., motor boat access) with in the marine management area of the Seashore.

Protection & Restoration of Marine Resources

The NPS would collaborate with other stakeholders across a broad spectrum of interests to restore the Seashore's native animal and plant communities (e.g., eel grass, clam beds). The ultimate aim of these efforts would be to protect and, where feasible, to restore the natural abundance, diversity, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems where they occur. Collaboration for shared stewardship is particularly important, since the Seashore's estuarine and ocean resources are part of a larger ecosystem, and pelagic resources are highly transient.

Cultural Resources

It is important to note that a separate set of management alternatives has been prepared for the William Floyd Estate and appear at the end of this chapter. Many proposals in this section apply to both Fire Island and the William Floyd Estate.

Research and Documentation of Federal Cultural Properties on Fire Island

The NPS would update the Historic Resource Study and develop a Cultural Landscape Report (CLR) and Treatment plan for Fire Island Light Station. Historic Structure Reports would also be prepared for the house and cottage at the Carrington Estate. The CLR would consider the potential effects of climate change and sea-level rise on the cultural landscape and would recommend adaptive management strategies to address them.

Submerged Archeological Resources

The Archeological Overview and Assessment prepared for the Seashore in 2005 did not address submerged archeological resources within the Seashore. However, the report did note that the Seashore was likely to contain important submerged sites. The NPS would undertake an Overview and Assessment of submerged archeological resources within the Seashore's boundary that would consider both federal and non-federal lands.

Curatorial Storage – Vulnerability Assessment

The Seashore would undertake a vulnerability assessment to evaluate conditions relative to climate change and sea-level rise in planning for any changes to the curatorial storage facility and would consider any resulting recommendations or concerns.

Cultural Resources at Risk from Coastal Erosion or Overwash

The NPS would identify areas where cultural resources are at highest risk due to erosion or overwash and would undertake the necessary process (e.g., archeological identification surveys, HABS/HAER/HALS documentation[2]) to document any cultural resources before they are permanently lost to natural processes on either federal and non-federal lands.

Oral History

To enhance the existing knowledge of how Fire Island and its surrounding waters have been enjoyed, used, and developed, the NPS would collaborate with local academic and historical institutions (e.g., Long Island Traditions, the Gilder Lehrman Institute of American History, local historical societies, Native American tribes, etc.) to undertake an oral history project regarding Fire Island and the establishment of the Seashore. The products associated with the project would be made available to the general public in a number of formats.

Shoreline Management

▸ **COASTAL LAND USE/ SHORELINE MANAGEMENT**

Coastal Land Use/ Shoreline Management Plan

The NPS would assume a leadership role in working with Fire Island communities, the towns of Islip and Brookhaven, Suffolk County, and New York State to develop a coastal land use plan for Fire Island. The plan would address shoreline protection, land-use controls, site planning, and design standards, and post-storm response in the context of the dynamic barrier environment and emerging trends resulting from sea-level rise and climate change. The plan must be undertaken and adopted as a multi-lateral, collaborative effort.

2 HABS – Historic American Building Survey, HAER – Historic American Engineering Record, and HALS – Historic American Landscape Survey

The plan would be consistent with the Tentative Federally Supported Plan (TFSP) for FIMP and would articulate a comprehensive strategy for protecting coastal resources while addressing resilience in land-use development within the coastal zone on both federal and non-federal lands within the Seashore. Further, the plan would be consistent with the recommendations of the 2013 interagency Hurricane Sandy Rebuilding Strategy. The report includes a number of recommendations relevant to Fire Island National Seashore. They include:

- Facilitating future risk assessment, such as sea-level rise, into planning and redevelopment efforts
- Applying infrastructure resilience guidelines to all federal infrastructure investments
- Ensuring a regionally coordinated, resilient approach to infrastructure investments
- Consider green options in all infrastructure investments
- Working with local governments to improve their capacity to plan for long-term rebuilding and prepare for future disasters.

Post-Storm Recovery Planning

Within the Community Development District, properties damaged or destroyed by overwash would continue to be allowed to be repaired or rebuilt, consistent with existing state and federal law, local codes, and the Secretary's zoning standards.

The NPS would work with other federal and state agencies, towns, communities, and state and county parks to develop a post-storm recovery plan for Fire Island. The plan would provide guidelines on how to respond to a range of storm events, including various degrees of structural damage and shoreline change. The NPS would encourage Fire Island communities, Smith Point County Park, and Robert Moses State Park to include post-storm planning guidelines in their local comprehensive or master plans that are consistent with the post-storm recovery plan developed for Fire Island. The plans should be consistent with the Fire Island Coastal Land Use and Shoreline Management Plan, and the Tentative Federally Supported Plan for FIMP.

Seek Opportunities for Acquisition through application of Retained Use & Occupancy

The NPS would pursue the acquisition of developed private properties located in environmentally sensitive areas such as dunes or wetlands and would enable the seller to retain use and occupancy of the property for a specified period of time. The landowners are paid the full fair market value of the property minus a deduction based upon the number of years they will remain in possession. Such actions would be undertaken opportunistically by the NPS only on a willing-seller basis. Once the former owner permanently vacates and NPS assumes full ownership of the property, structures would be removed and the land would be allowed to revert to a natural state.

Conservation Easements

The NPS would work with Fire Island communities and local land trusts to preserve open space within the communities and would accept the donation of conservation easements on undeveloped parcels on Fire Island that possess important natural or cultural values.

Dredge Management Plan

The NPS would work with federal, state, and local government, and other entities to develop a programmatic dredge management plan to allow for the placement of dredge materials for beneficial purposes (e.g., augment eroding shorelines and protect habitats) along the bay and ocean shorelines of Fire Island as appropriate. Use and placement of dredge materials would emulate bayside natural systems of sand movement as feasible. This plan would be consistent with the Coastal Land Use and Shoreline Management plan and would also address maintenance dredging needs for navigation channels and marinas on Fire Island, assess any contaminant issues, determine a planned frequency of dredging, and evaluate environmental and cost-effective alternatives to dredging at some locations (e.g., shallow draft vessels).

Public Outreach

The NPS would work with Fire Island communities, state and local agencies, the realty community, and others to ensure that property owners, property managers, and the general public fully understand the dynamic nature of the barrier island and the potential risks associated with owning and managing property within the coastal environment. Through personal communication, publications, on-line media, and formal training and workshops, the NPS and its partners would work to communicate this important information.

Seashore Experience

Broaden Visitor Base

The NPS would continue to seek to broaden the diversity and geographic scope of the Seashore's visitation to ensure that it is more representative of regional and

national demographics with regard to ethnic, cultural, and socioeconomic groups. The NPS would accommodate a variety of recreational activities in a manner that minimizes resource degradation and user conflicts.

Educational Outreach
The NPS would enhance its public outreach program through a variety of means, including the use of technology and social media. The NPS would expand educational outreach to a broad demographic, including more in-school programming, teacher education, and greater opportunities for field experiences (e.g., citizen-scientist programs). Educational programs would highlight the Seashore's resources, resource issues, and current park science and scholarship.

Sustainability Role Models
The NPS would model the principles of sustainability through its actions as a manager and steward of Fire Island and the William Floyd Estate to adopt and model the best possible management practices, minimizing the Seashore's impacts on the natural and cultural environment. The principles of sustainability would become an important tenet of the Seashore's educational outreach programs.

Public Information, Orientation and Way finding
The NPS, in conjunction with other entities would improve way finding to and throughout the Seashore, including signs, maps, and other information that may be located at such places as the region's airports, connecting train stations, ferry terminals, Fire Island communities, Seashore destinations on Fire Island, and the William Floyd Estate. The NPS would take advantage of new and developing technologies to provide Seashore visitor information and orientation.

Visitor Research
The NPS would regularly research visitor use and satisfaction throughout Fire Island to better understand and respond to visitor issues, needs, and desires. Elements of the Seashore experience such as visitor use patterns, experiences, safety, and satisfaction with services and facilities would be identified. Joint efforts to collect data on visitor activity and attitudes would be undertaken in partnership with Fire Island communities and adjoining recreation areas. Interpretive programs and media would incorporate formal and informal evaluation components to gauge effectiveness.

▸ VISITOR FACILITIES

Patchogue/ Mainland Facilities
Consistent with the clean energy objectives proposed in the Seashore's "Climate Friendly Park Action Plan," the NPS would pursue the development of solar shade structures over some or all of the Ferry Terminal parking area to mitigate the effect of urban heat islands, reduce the Seashore's environmental footprint, and lower utility costs. To manage costs, NPS would collaborate with local utilities while ensuring consistency with federal laws, regulations, and policy.

Talisman
The NPS would consolidate the facilities serving Barrett Beach and Talisman into an area known simply as "Talisman."

Land Use & Development

Community Character
The NPS would work collaboratively with other entities to encourage, support, and cooperate with Fire Island communities and the towns of Islip and Brookhaven to assist in the identification and preservation of the distinctive character of each Fire Island community and of Fire Island as a whole. NPS involvement would largely take the form of research, technical assistance, and interpretation, and in support of local community visioning or hamlet planning efforts.

Revise Land-Use Regulations
Working in collaboration with Fire Island stakeholders, the NPS would revise the Secretary's zoning standards guiding land use and development and subsequently local land-use regulations to address inconsistencies, provide greater specificity and/or guidance, and define with greater clarity the role of the NPS. Alternatives to traditional zoning (e.g., performance based measures, etc.) would be considered. Revised land-use regulations would articulate the standards to be met for a variance, outline a clear review process, and clearly describe how inconsistent developments would be addressed, on the local or federal level, or both.

The NPS would also work with state and local interests to improve the development process making it more transparent and predictable. Information about the development process including necessary reviews, permitting, certifications, and the status of active proposals should be readily available to the public.

Zoning Workshops

New York State law requires that members of local planning and zoning boards obtain four hours of training annually. Town, village and city zoning boards of appeal and planning board members, as well as county planning board members must receive training. NPS would offer trainings for its management partners and relevant local boards with regard to the application of the Secretary's zoning standards on a regular schedule – perhaps biannually, or as board membership turns over.

Realign the Dune District with CEHA

The NPS would pursue the realignment of the Dune District to be either co-terminus with the NYS CEHA or dropped entirely, wherein CEHA would become the officially designated/legislated line for federal zoning purposes. Presently, both state and federal designations are intended to protect the protective feature, the primary dune, from inappropriate developments. Per 36 CFR Part 28.3(d), The *Dune District* "extends from the mean high water line to 40 feet landward of the primary dune crest" as mapped in 1976 and adopted by Congress in 1978, and described on a map entitled Fire Island National Seashore Map #OGP-0004. The CEHA line is described under NYS law as including the near shore, beach and dunes to a northern boundary line measured 25 feet landward of the landward toe of the primary dune. This difference would need to be reconciled under federal regulations via a legislative amendment. Additionally, although both federal and state districts may be remapped, NYS law explicitly states that it is permissible to remap the CEHA based on erosion or accretion, whether by natural or manmade processes. The federal law would likely not permit any kind of remapping of a dune protection measure based on any kind of accretion event; as such an event would undoubtedly be temporary in nature, resulting in potential developments that would require a greater degree of government protection and/or intervention.

Support Sustainable Infrastructure

Through the cooperative stewardship entity, NPS would collaborate with communities, towns, the county, and others to support the development of sustainable infrastructure solutions related to renewable and alternative forms of energy, water conservation, and waste management Fire Island-wide. The NPS would adopt the principle of "Reduce, Reuse, Recycle" and would work with others to move Fire Island toward a "zero waste" objective. The NPS would establish incentive programs, such as awards and other acknowledgements for communities and/or individuals, to promote green practices and recognize achievements.

New Master Plans for Federal Facilities

The NPS would develop updated master plans for Fire Island Light Station, Sailors Haven, Talisman, Watch Hill, and the Wilderness Visitor Center that address site circulation, rehabilitation or replacement of existing facilities (e.g., maintenance, staff housing, visitor facilities), visitor amenities (e.g., group educational shelters, moorings), interpretive media, infrastructure, reducing environmental impacts (e.g., water quality, shoreline erosion, etc.) and improving operational efficiencies. Each master plan would include an analysis of the potential impacts of climate change and sea-level rise, and employ relevant departmental and agency standards and guidelines.

Transportation

▸ LAND-BASED ACCESS

Develop "Driver's Manual"

In collaboration with Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County, the NPS would create a "drivers manual" that would educate residents, workers, and visitors about driving etiquette and getting around on Fire Island while protecting the fragile barrier island environment. This could also include information on the availability and cost of freight, garbage collection, and other services. It could also offer examples of "best practices" that enhance the use of water-based transportation while limiting driving.

▸ WATER-BASED ACCESS

Lateral & Cross-Bay Ferry Service

The NPS would also work with others to improve the lateral and cross-bay ferry service to ensure it meets the needs of more visitors and contractors related to schedule, destinations, affordability, and universal accessibility to Fire Island.

Coordination of Transportation of Personnel

The NPS would seek out opportunities to coordinate travel to Fire Island among the Seashore's management divisions to reduce the number of boat trips and vehicular use. The NPS would explore the use of incentives to encourage utilities, essential services, and contractors to coordinate travel and/or increase their use of water-based transportation. Some possible incentives could include reduced permit fees or space on NPS lands on Fire Island to temporarily stage equipment or materials.

Moorings or No-Anchor Zones

The NPS may consider the institution of a formal mooring system or "no anchor zones" to protect the Seashore's marine resources. These measures could be instituted in response to the recommendations of a Marine Resources Management Plan.

Operations and Maintenance

▸ SEASHORE HEADQUARTERS & MAIN MAINTENANCE FACILITY – PATCHOGUE

New NPS Facility Development

The NPS acknowledges that climate change will significantly change conditions at the Seashore, including the impacts from sea-level rise and potentially destructive storm events. More detailed examination of these factors will influence the type, design, location, and ultimate feasibility of any proposed project.

On federal lands the NPS would concentrate any new or redeveloped facilities within existing disturbed areas, away from wetlands and other environmentally sensitive areas. The NPS would ensure that all new construction or redevelopment meets departmental, agency, and relevant local standards and codes for construction and are consistent with nationally recognized principles and processes for sustainable development within a coastal context.

Park Administration

▸ COOPERATIVE STEWARDSHIP

In support of the NPS commitment to cooperative stewardship, the NPS, Fire Island communities and other relevant entities would work collaboratively to improve land-use planning and regulations and to protect the environmental quality and distinctive character of Fire Island. Such work would rely on regular and meaningful communication among parties, coordination in issue resolution, and cooperation in action. To accomplish this, the NPS would propose the creation of a regular forum for communication, coordination, and collaboration in managing Fire Island. Two distinct alternative approaches are being considered, one of which could be adopted to create a forum for regular communication, cooperation, and collaboration. Under any cooperative stewardship approach, the NPS would continue to manage Fire Island National Seashore in accordance with all applicable laws and policies including the National Park System Organic Act and NPS Management Policies.

Reauthorize and re-establish the Fire Island National Seashore Advisory Commission[3]

The Seashore's original enabling legislation (P.L.88-587, Section 9) established an advisory commission with the stipulation that it be terminated "on the tenth anniversary of this Act or on the declaration, pursuant to Section 2(b) of this Act, of the establishment of the Fire Island National Seashore, whichever occurs first." As originally indicated in the legislation, "the Secretary or his designee shall, from time to time, consult with the members of the Commission with respect to matters relating to the development of Fire Island National Seashore and shall

3 The Advisory Commission model described here is largely based on the Cape Cod National Seashore Advisory Commission. To learn more, visit www.nps.gov/caco/parkmgmt/advisory-commission.htm .

consult with members with respect to carrying out the provisions of Sections 2 (land acquisition), 3 (regulations), and 4 (owners' use of property) of this Act."

NPS would seek legislative authority to reauthorize and re-establish the Fire Island National Seashore Advisory Commission to serve as an advisory body. The Advisory Commission would be composed of a broad representation of Fire Island stakeholders and interests who would serve staggered terms. The purpose of the Advisory Commission would be to represent various groups with interests in the Seashore and make recommendations to the Superintendent on issues related to the management of the Seashore and Island-wide matters including but not limited to land use and development, coastal zone management, transportation, marine resource management, and wildlife management.

The Commission's role would be purely advisory. It would meet on a regular basis and it would be undertaken in compliance with the Federal Advisory Committee Act (FACA). Meetings of the Commission would be open to the public and would be held in locations and in such a manner as to ensure public access and involvement. The NPS would provide staff and technical assistance to the Commission.

Create the Fire Island Management Partnership[4]

The NPS would seek legislative authority to create a Fire Island Management Partnership. The partnership's purpose would be to coordinate the activities of federal, state, and local authorities and the private sector as they pertain to Fire Island National Seashore and Island-wide matters including but not limited to land use and development, coastal zone management, transportation, marine resource management, and wildlife management. The Partnership would collaborate in the development, adoption, and implementation of any management plan having Island-wide implications including land use zoning or relevant management plans (e.g., Coastal Land Use and Shoreline Management Plan). The Partnership would play a formal role in the review of applications for variances, exceptions, permits for commercial or industrial use, or special permits submitted to the zoning authority for any development, use or change of use, and could offer a formal recommendation to the Superintendent of the Seashore.

The Management Partnership would be composed of members appointed by the Secretary of the Interior and could include representation from the NPS, New York State, Suffolk County, the towns of Islip and Brookhaven, the villages of Ocean Beach and Saltaire, the Fire Island Association, the U.S. Coast Guard, and the U.S. Army Corps of Engineers. Under this model, participating stakeholders would play a planning and advisory role, but would not have regulatory authority that reaches beyond their individual missions and mandates. The NPS would provide staff and technical assistance to the Partnership.

The Partnership may be endowed with the following authorities:

- To hold hearings and to take testimony
- To seek and accept donations of funds, property or services for the purposes of carrying out its duties
- To use funds to meet matching obligations in order to obtain funds from any source under any program or law
- To obtain by purchase, rental, donation, or otherwise, such property, facilities, and services as may be needed to carry out its duties. The Partnership may not acquire any real property or interest in real property.
- To implement the Plan, and for purposes of carrying out the Plan, enter into cooperative agreements with local or state government, any organization, or person

Commercial Services Plan

Under all action alternatives, the NPS would prepare a commercial services plan to determine which types and levels of activities, services, and facilities would be provided at the Seashore and how they would be managed by the NPS in the most effective and efficient manner. The commercial services plan would identify the best management approach for ferry transportation and the operation of marinas, food services, and other visitor service activities. The Commercial Services Plan would also address strategies for introducing sustainable design, energy efficiency, pricing and affordability, and other conditions of use into the administration of commercial services at the Seashore.

Volunteers

The NPS would work to expand its corps of volunteers and encourage greater volunteer involvement in educational outreach, resource inventory and monitoring, and other facets of park management.

4 The Management Partnership model described here is largely based on the Boston Harbor Islands Partnership. To learn more, visit www.nps.gov/boha/parkmgmt/partnership-members.htm .

Legislative Requirements

Recognizing Island Communities as Stewards
The Seashore's enabling legislation would be amended to include language recognizing the role of the Fire Island communities as partners in its management as they continue to play a substantial role in shaping Fire Island's natural and human environment.

Cooperative Stewardship Approach
The two cooperative stewardship approaches described above would each require Congressional action to authorize and enable them.

Realign Dune District with CEHA Line
The NPS would seek the necessary authority to realign the existing Dune District with the state's CEHA line, as appropriate.

Otis Pike Fire Island High Dunes Wilderness

The Otis Pike Fire Island High Dune Wilderness ("Fire Island Wilderness"), encompassing 1,380 acres of the Seashore, was designated in December 1980 (P.L. 96-585). In the Seashore's 1964 enabling legislation (P.L. 88-587), the area now encompassing the Fire Island Wilderness was referred to as "8 mile zone" that would be accessible by "ferry and footpath only" and "no development or plan for conveniences of visitor shall be undertaken therein which would be incompatible with the preservation of flora and fauna or physiographic conditions now prevailing and every effort shall be exerted to maintain and preserve this section of the Seashore . . . in as nearly (its) present state and condition as possible." The Fire Island Wilderness is unique as it is the smallest wilderness area managed by the NPS and the only federally designated wilderness in New York State. It is further distinguished by the fact that it occurs in the single largest metropolitan area of the United States, offering the opportunity to experience wilderness in a location and at a scale that makes it accessible both physically and emotionally to a large urban population.

In 1983, a Wilderness Management Plan was completed for the area. That plan addressed the removal or gradual filling in of incompatible structures and other man-made features such as old community walkways and mosquito ditches. It also addressed Wilderness exclusions, potential additions, uses, management, and facilities.

The NPS is preparing a new Wilderness Stewardship Plan for the Fire Island Wilderness, which is broadly addressed in this draft GMP/EIS as outlined below. Early in the planning process, the national office of the NPS Wilderness Stewardship Program requested that wilderness planning be integrated with Seashore's GMP/EIS planning process to ensure that it was given full consideration as other proposals within the plan were developed and evaluated for environmental compliance.

A more detailed draft Wilderness Stewardship Plan that, when approved and adopted, would supersede the 1983 Wilderness Management Plan, appears in Appendix D of this document. Typically, the Wilderness Stewardship Plan is prepared as an implementation plan after the completion of an approved GMP. However, because the proposed actions related to the Fire Island Wilderness are considered to be Common to All Action Alternatives, it was deemed appropriate to prepare and release these documents concurrently.

Wilderness Character Monitoring Program
The NPS would monitor and manage resources within the Fire Island Wilderness in a manner that protects its untrammeled and undeveloped qualities, natural systems, offers opportunities for solitude or primitive and unconfined recreation, and preserves its unique features consistent with indicators and measures based on the Interagency monitoring strategy called *Keeping it Wild: An Interagency Strategy to Monitor Trends in*

Wilderness Character across the National Wilderness Preservation System.

The strategy was developed by the Interagency Wilderness Character Monitoring Team representing several bureaus within the Department of the Interior including the Bureau of Land Management, the Fish and Wildlife Service, the National Park Service, and the U.S. Geological Survey, and the U.S. Forest Service in the U.S. Department of Agriculture. It was designed to apply to every wilderness regardless of administering agency, size, geographic location, type of ecosystem, permitted uses, or any other attribute.

Potential Wilderness Additions

Because of existing facilities or uses located at Old Inlet and the Smith Point West Nature Trail, these areas were originally deemed incompatible with a Wilderness designation. Due to the removal of the incompatible features related to the Smith Point West Nature Trail and the loss of Old Inlet facilities resulting from Hurricane Sandy in 2012, these areas (approximately 1 acre) will be designated as Wilderness upon publication of a notice in the Federal Register.

Wilderness Use

Passive recreational activities such as hiking and sunbathing would continue, as would the collection of beach plums and blueberries. Hunting and overnight camping would continue to be allowed by permit. The NPS would consider allowing horseback riding by permit in the Fire Island Wilderness. The NPS would continue to work with native tribes to accommodate traditional uses in the wilderness, including ceremonial activities.

Resource Management

Natural and cultural resources would be managed in a manner that does not impede natural processes or infringe upon wilderness character. Wildlife and vegetation management within the Fire Island Wilderness would continue, with each proposed management action undergoing a Minimum Requirement Analysis to consider its potential impacts on the character and qualities of the Fire Island Wilderness.

Trails & Dune Crossings

The NPS would no longer maintain formal dune crossings into the Fire Island Wilderness that connect to a trail that in places follows the historic path of the Burma Road. In their stead, the Seashore would place temporary markers on the beach face to indicate appropriate places for visitors to access the Fire Island Wilderness. The through trail would be minimally maintained to accommodate foot traffic. The Smith Point West Nature Trail (approximately 1,000 feet) would be maintained by the NPS.

Signage

The NPS would continue the use of temporary signage to address visitor safety and resource protection needs as necessary. The NPS would ensure that such signage is kept to a minimum and does not permanently affect any of the factors contributing to wilderness character.

Research facilities and aids to navigation

The NPS would continue to allow for the temporary placement of some research instruments (e.g., sediment, elevation table) that support the Seashore's resource management objectives. A Minimum Requirement Analysis would be undertaken to evaluate research proposals for their compatibility with Wilderness character. The NPS would also continue to allow existing aids to navigation located within the Fire Island Wilderness to remain.

Bellport Beach

The Fire Island Wilderness is bisected by Bellport Beach, which is a bay- to -ocean stretch that is owned and operated by the Village of Bellport for the use of its residents. The NPS would continue to work with the Village of Bellport to ensure that Bellport Beach and the activities that occur there do not have a negative impact on the Fire Island Wilderness.

Management Alternative 2: ENHANCING NATURAL RESOURCE VALUES

Concept

Under this alternative, greater emphasis would be placed on the protection and restoration of natural ecological systems, patterns, and resources on federal lands. A nature-based park experience would be emphasized, and the overall development footprint of the Seashore would be reduced. Visitor use and activity would be carefully distributed and accommodated in a manner that emphasizes protection of the Seashore's resources. A proactive, collaborative approach to stewardship among existing and new partners would be considered fundamental to the plan's success.

Natural Resource Management

Under this alternative the NPS would work with park partners to pursue a proactive program of natural resource protection within the Seashore and would seek to restore degraded or damaged ecosystems, as feasible.

In addition to the proposals prescribed under Elements Common to All Action Alternatives, the following management practices would be proposed:

Terrestrial Resources

▸ NATIVE PLANT AND ANIMAL SPECIES

Mosquito Surveillance & Management

Same as Alternative 1

Public Education & Outreach

As in Alternative 1, the NPS would continue to disseminate information related to living with wildlife to the public using a variety of interpretive media to inform and educate visitors about the Seashore's natural resources and resource management issues (such as endangered species and living with wildlife). In addition to informational brochures and other publications, the NPS would expand the use of ranger- or volunteer-led programming and personal contact with the public, and make additional use of the Internet and social media to foster a greater understanding of how visitors can safely enjoy their outdoor experience and be better resource stewards. Cooperative educational programs and demonstration projects related to resource stewardship (e.g., citizen science) would also be an important facet of public education and outreach.

Restoration of Native Plant Species

The NPS would develop and execute a proactive strategy for the eradication of invasive non-native plant species and the restoration of native plant species on federal lands through the most effective and environmentally sound means available.

The NPS would collaborate with Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to encourage similar eradication and restoration efforts on non-federal lands on Fire Island. Collaboration could take the form of but would not be limited to education, a cooperative greenhouse to propagate native species, and/or joint demonstration projects.

In addition to restoration efforts at Sunken Forest (described in "Elements Common to All Action Alternatives"), the NPS would seek to protect and restore other maritime forests on Fire Island as well as other terrestrial habitat types.

Marine Resources

▸ OCEAN AND ESTUARINE RESOURCES

Managing Non-Native Invasive Plant and Animal Species

The NPS would undertake inventory and monitoring to identify non-native species in the marine environment. The NPS would work collaboratively with local, state, and regional agencies on the control and eradication of non-native species (such as mute swans, Asian shore crabs, and colonial tunicates –i.e. marine invertebrates such as sea squirts) that negatively affect sensitive marine habitats. The NPS would collaborate with others to conduct research to understand the impacts of non-native species on marine ecosystem structure and function.

Cultural Resource Management

Similar to Alternative 1, under this alternative the Seashore's primary management emphasis would continue to be cultural resources that occur on federal lands, particularly at the Fire Island Light Station and the William Floyd Estate. As funding becomes available, the NPS would continue work to preserve cultural resources, undertaking appropriate preservation treatments. Seashore collections would continue to be housed in the curatorial storage facility located at the William Floyd Estate.

It is important to note that a separate set of management alternatives has been prepared for the William Floyd Estate and appear at the end of this chapter. While there may be an occasional reference to cultural resource management at the William Floyd Estate, this section focuses primarily on the cultural resources associated with Fire Island.

In addition to the proposals prescribed under Elements Common to All Alternatives, the following management practices would be proposed:

Carrington Estate

As in Alternative 1, the NPS would work collaboratively with local conservation and preservation interests to rehabilitate and adaptively reuse the main house and cottage on the property for administrative purposes. The associated landscape would be rehabilitated to the degree

necessary to ensure safe circulation on the property and access to the structures.

Museum and Archival Collections -- Curatorial Storage
The NPS would continue to house the museum and archival collections in their present locations. Consistent with recommendations made in the Seashore's Collection Management Plan (2006), the existing interior space of the present curatorial storage facility would be reorganized and refurnished with more space-efficient, archival-quality storage units to maximize the use of the space. The NPS would adjust the Seashore's Scope of Collections to better manage the accession of museum and archival materials and allow for the expansion of its natural history collection. Seashore staff would continue to offer limited tours of the curatorial storage facility as feasible and would continue to provide assistance to researchers. Workspace for conservation and research activities would continue to be limited.

Seashore Experience

While visitors would continue to enjoy access to and interpretation of cultural resources at the William Floyd Estate and the Fire Island Light Station, under this alternative the park experience at the Seashore would center on close contact with and immersion in the natural landscape. Clearly organized access routes would minimize the disturbance of natural resources, with access to some areas being restricted and some different types of uses that are "lighter on the land" being encouraged.

Interpretive Emphasis
Interpretive media and programs would emphasize the power of natural processes to shape this landscape. It would also focus on the richness and fragility of Fire Island and how human actions undertaken to adapt to or manipulate the coastal environment have affected the barrier island both positively and negatively.

Public Information and Programs
The NPS would continue to maintain a robust Seashore web page on the NPS website (www.nps.gov/fiis) and a social media presence providing information on Seashore programs, recreational opportunities, resources, and management. Ranger-, partner-, and volunteer-led programs would continue primarily during the summer visitor season and be available at most Seashore facilities on Fire Island. A wide range of regularly scheduled public programming would occur year round at the Fire Island Light, the William Floyd Estate, and at the eastern entry to the Fire Island Wilderness.

In addition to the traditional museum exhibits and interpretive waysides found at Fire Island Light Station, the William Floyd Estate and other Seashore facilities, the availability of digital media (e.g., web info/download, cell phones, iPods) and personal services would be expanded, particularly in the Seashore's natural areas. Seashore brochures would also continue to be an important way to deliver a wide range of information on general Seashore orientation, specific sites , and public safety, among other topics.

Educational & Community Outreach
The NPS would expand its educational and community outreach programs to make them available to a wider audience. Sustainability efforts would focus on modeling methods for the stewardship of natural resources and related processes, citizen stewardship programs, and outreach to schools and community groups. Community-based programming would be an important facet of this outreach strategy.

▸ VISITOR FACILITIES

Under Alternative 2, the visitor experience would emphasize opportunities for immersion in the natural environment. Visitor orientation facilities and exhibits would be located on Long Island rather than on Fire Island and would make use of existing structures wherever feasible. The number of visitor facilities on Fire Island would be reduced. Where feasible, the use of seasonal, temporary structures would be considered.

Patchogue/ Mainland Facilities
As in Alternative 1, the Ferry Transportation Center (opened in 2010) with ferry service to the Seashore's Watch Hill facility would continue to serve the public. Under this alternative, a more in-depth orientation exhibit would be installed in the multipurpose space. An audio-visual presentation orienting visitors to the Seashore would also be available for viewing on a regular schedule in the same space. The multipurpose program space would continue to be available for meetings, lectures, and other special programs as necessary. In addition to encouraging the use of public transportation, the NPS would work with Long Island Railroad (LIRR) and the ferry operators to orient their Fire Island travel packages and marketing campaigns toward the use and enjoyment of the Seashore's visitor areas at Fire Island

Lighthouse, Sailors Haven, Watch Hill, and the William Floyd Estate.

Fire Island Light Station

As in Alternative 1, operations and visitor programming at the Fire Island Light Station would continue to be managed by the Fire Island Lighthouse Preservation Society (FILPS) through a formal agreement with the NPS. The NPS would work with FILPS to update exhibits to include expanded interpretation of the Light Station's cultural landscape, natural features, and to provide more information orienting the visitor to Fire Island as a whole. The NPS would work with Robert Moses State Park and the local transit authority to make the West End Entrance Station a formal transit bus stop. The NPS would collaborate with Robert Moses State Park to develop an outdoor interpretive exhibit that would be located at Field 5 and would orient visitors to Fire Island and provide interpretive information on barrier island dynamics, living on a barrier island, and other relevant topics.

Sailors Haven/Sunken Forest

Under this alternative, facilities at this location would gradually be scaled back to allow for the restoration and regeneration of the Sunken Forest and the bayside shoreline. Greater emphasis would be placed on offering educational and interpretive programming related to the particular natural resource values associated with the site. Consistent with a new master plan to be developed for the site, when existing facilities reach the end of their structural lifecycle, they would be removed and, in some cases, replaced with more sustainable structures. At the end of its structural lifecycle, the existing 48-slip marina would be removed to enable restoration of the bay shoreline in the location of Sunken Forest. The ferry dock, existing bathhouse, visitor contact facility, and the current system of boardwalks and concrete trail would be retained. Services would continue to include lifeguards at the ocean front beach and ranger-led programming. The NPS would rehabilitate the Sailors Haven Visitor Center to include an update of exhibits and sales space as funds become available. Interpretive signage along the Sunken Forest trail would also be updated. NPS would also develop a covered, outdoor flexible program space to support interpretive and educational programming.

Talisman

Under this alternative, Talisman would remain a day-use area. Consistent with a new master plan, at the end of their structural lifecycle, the restrooms, beach walk, and old hotel building at the west end of the area would be removed. The boat dock and nearby restrooms would be retained as would the boardwalk to the ocean beach.

Watch Hill

Under this alternative greater emphasis would be placed on offering educational and interpretive programming related to the specific natural resource values associated

with Watch Hill – particularly emphasizing its relationship to the salt marsh and the water. Watch Hill's place as the western gateway to the Fire Island Wilderness would also be recognized and addressed. The NPS would continue to provide a lifeguarded beach on the ocean side. A new master plan would be prepared for Watch Hill to address the site's aging infrastructure in the context of the dynamic coastal environment as it is influenced by climate change and sea-level rise.

A new campground similar in scale to the current facility would be developed at a more suitable location on Fire Island. The new campground would be located in a previously disturbed area at Sailors Haven, Talisman, or Watch Hill and would be considered in the master planning process for each of these locations. The old campground would be removed and the site would be permitted to revert to its natural state.

Wilderness Visitor Center

The Wilderness Visitor Center is located at the eastern entry of the Wilderness Area. Under this Alternative, the NPS would minimize development at the edges of the Fire Island Wilderness. The existing Wilderness Visitor Center would be replaced with a small simple structure that would offer an outdoor information plaza with a kiosk and restroom facilities. The existing parking corral would be retained to accommodate universal access. Most visitors would continue to park in the adjoining Smith Point County Park lot. An electronic beach access gate would be installed to control access for off-road vehicles.

Bay Shore, Sayville, & Patchogue (Davis Park) Ferry Terminals

The NPS would collaborate with boat operators to develop basic orientation waysides to be installed in a prominent location at each Long Island ferry terminal to provide visitor information to passengers traveling to Fire Island by way of the communities.

▸ RECREATIONAL USES

As in Alternative 1, a range of recreational opportunities would continue to be available at Fire Island. Activities that enable visitors to make a greater connection to the natural environment would be encouraged. Smaller-scale facilities may reduce crowding in certain locations producing more opportunities for a contemplative experience.

Life-Guarded Beaches

The Seashore would continue to provide lifeguards seasonally at the ocean beaches at Sailors Haven and Watch Hill. Hours of lifeguard operations at the protected beaches would be determined based on the level of visitor use and consistent with existing policies and guidelines for visitor safety. There would be no life-guarded beach at Talisman.

Kayaking/Canoeing

Under this alternative, the Seashore would continue Watch Hill guided canoe trips and would add route(s) through shallow waters on the bay side of the Fire Island Wilderness. The development of a water route would be undertaken by the NPS with the support of the NPSs Rivers, Trails, and Conservation Assistance (RTCA) program. The NPS would offer a water trail guide or brochure, and occasional guided experiences offered by Seashore staff.

Beach Camping in front of the Wilderness Area

As in Alternative 1, beach camping in front of the Wilderness Area would continue under the following conditions:

- No more than 36 people may camp in the Fire Island Wilderness zones and the Great South Beach zones combined.
- No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern Zone.
- No more than 24 individuals in no larger than groups of 8 per campsite in the Western Zone.
- Camping on the beach would be permitted annually from July 1 through Labor Day.

Transportation

▸ LAND-BASED ACCESS

Public Transportation

Under this alternative, the NPS would collaborate with the Long Island Railroad, Suffolk County Transit, and the ferry companies to aggressively promote the use of public transportation to access all of Fire Island and the William Floyd Estate. Methods may include the use of special promotions (e.g., if visitors can show a valid, dated transit ticket they may be eligible for program fee waiver or reduced fares) or improved infrastructure like bicycle racks located at train, bus, and ferry terminals.

▸ WATER-BASED ACCESS

Private Boaters

Under this alternative, the number of overnight boat slips available for the use of private boaters on Fire Island would be reduced because the marina at Sailors Haven would eventually be removed. At Sailors Haven and Talisman, private boaters would continue to be able to drop off passengers and gear at the dock and to anchor offshore.

Lateral and Cross-Bay Ferry Services

As in Alternative 1, the Seashore would continue to work with other Fire Island stakeholders to manage ferry service to ensure that it continues to provide a quality experience and remains the primary form of transportation to and from Fire Island. The NPS would require that ferries serving Seashore destinations be more sustainable (e.g., reduced emissions, use of alternative fuels, etc.) and encourage Fire Island communities to do the same with their ferry operators.

Improve Water-Based Access

The NPS would work with Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to expand opportunities for water-based facilities on Fire Island that can accommodate the movement of goods and services (e.g., cargo/materials delivery; debris removal, etc.).

Operations & Maintenance

Under this alternative the scope and function of the operation and maintenance of the Seashore would be adjusted consistent with the new changes and requirements proposed under this alternative. Though there would be fewer large-scale facilities, more trails and boardwalks may be developed to accommodate public access while preventing resource degradation. Some new structures developed on Fire Island may be seasonal and removable, requiring significant effort at the beginning and close of each visitor season as well as off-season storage. Any expansion of facilities for administrative or maintenance purposes would take place on Long Island, not Fire Island. Greater emphasis would be placed on improving energy efficiency and making use of alternative technologies to power facilities and address transportation, wastewater, and waste management needs.

Staff Housing

As under Alternative 1, the NPS would continue to maintain and make housing available to Seashore and concession employees for rent at fair market rates. Seashore housing would also continue to be available to researchers on an as-needed basis. Under this alternative the number of available units would be reduced. Seashore housing at Talisman would be removed. The number of Seashore housing units at Fire Island Light Station and the William Floyd Estate would stay largely the same, while the number of housing units at Sailors Haven and Watch Hill would likely be reduced. The Seashore's Housing Plan would be updated to be consistent with the final approved GMP.

Trash Transfer Stations/ Waste Management

Under this alternative, the trash transfer station at Sailors Haven would be removed and a policy of "carry in/carry out" for trash would be instituted there and would remain in effect at Talisman and other undeveloped federal areas. The NPS would retain and operate the trash transfer station at Watch Hill and would continue to cart refuse off Fire Island by vessel.

Ranger Stations

Ranger Stations would continue to be located at the Lighthouse Annex at Fire Island Light and at the visitor facilities at Sailors Haven and Watch Hill. There would no longer be a ranger station at the eastern most end of the Seashore adjoining the Fire Island Wilderness; however, an electronic gate would be installed to control vehicular access to the beach. Permitting for camping, hunting, and driving would all occur online, at the Patchogue ferry terminal, or at the Seashore's administrative offices in Patchogue.

Lifeguard Facilities

As under Alternative 1, lifeguard facilities would continue to be located at Sailors Haven and Watch Hill.

Fire Island Light Station /Kismet Fire House

After the termination of the Kismet Fire Department lease in 2014, the NPS would remove the structure and allow the site to return to a natural state.

Park Administration

Under this alternative the NPS would continue to operate its facilities and provide for public programming and visitor safety by relying on a combination of NPS staff, volunteers, partners, cooperators, and commercial service providers. However, the NPS would assume responsibility for operating the campground on Fire Island. Resource management functions that are particular to federal lands would continue to be overseen primarily by the Seashore.

Staffing

Supplemental to the proposed additions to the Seashore staff described under Alternative 1, up to six other positions would be required to meet the demands of this alternative, with an increased focus on research, monitoring, resource protection, and education related to natural resources. This would include a dedicated GIS specialist for the Seashore and additional natural resource management professionals with expertise in coastal ecology and marine biology.

Commercial Services

Under this alternative the NPS would reduce the number of services provided by private concessioners. The NPS would resume responsibility for managing the campground on Fire Island. The Watch Hill Marina would continue to be operated through a concessions contract.

Cooperators

As under Alternative 1, the NPS would continue to rely on cooperating associations. The Fire Island Lighthouse Preservation Society would continue to operate and maintain the Fire Island Lighthouse and provide visitor services to the public. The Seashore would also continue to work with a cooperating association (presently Eastern National) that manages sales outlets at various locations throughout the park including Watch Hill, Sailor's Haven, and the William Floyd Estate.

Partners

The NPS would expand the Seashore's network of partners and cooperators to assist in managing park facilities, areas, and programs consistent with the Seashore's purpose and goals.

Legislative Requirements

There are no legislative proposals specific to this Alternative.

Management Alternative 3:

RECOGNIZING THE RELATIONSHIP BETWEEN HUMAN USE AND NATURE *(NPS Preferred Alternative)*

Concept

This alternative acknowledges that Fire Island is a natural landscape with a significant cultural overlay and recognizes the strong connection between natural and cultural resource protection and human use. Historically, human use and development on Fire Island have reflected and responded to the natural qualities and character of the barrier island environment in the ways that it has been used, adapted to, and manipulated. In the 1950s, when the natural qualities and character of the barrier island environment were threatened by a destructive development proposal, the cultural response was to advocate for the creation of Fire Island National Seashore. On Fire Island it has long been recognized that care must be taken to ensure that the "cultural footprint" on the barrier island does not overwhelm its natural qualities and character. Through a proactive and collaborative management approach, the NPS would seek an appropriate balance between continuing human use and protecting Fire Island's fragile environment.

The Seashore experience and interpretation would recognize the relationship of human involvement with the dynamic natural landscape of the barrier island. Fire Island would be explored from the perspective of the pre- and post-contact history of Long Island and New York Harbor, from its early use for agricultural and maritime purposes to its emergence as a distinctive vacation destination and finally a National Seashore. In considering Fire Island's human history, the relationship to the natural environment would be central, as it is largely a story of adaptation and manipulation that has shaped the place that exists today and will influence how the NPS, Fire Island communities, and other Seashore stakeholders respond to the effects of climate change and sea-level rise.

The NPS would also engage in outreach and collaborative efforts that would enhance the public's understanding and appreciation of the Seashore within its regional historic, cultural, and natural context.

Existing infrastructure would be retained and, over time, would be improved and/or reoriented to be greener, more efficient, and better adapted to the coastal environment. Any new development meant to create improved opportunities for visitor use and appreciation of resources would be limited to existing visitor-use areas and would be undertaken only after appropriate climate change and sea-level rise risk assessments have been completed. A more detailed examination of these factors will influence the type, design, location, and ultimate feasibility of any proposed project.

Natural Resources

Under this alternative, the NPS recognizes that human activities and the built environment would continue and would commit to working collaboratively to minimize or mitigate impacts on the natural environment in order to prevent further loss or degradation (e.g., implement sustainable practices, upgrade wastewater management, etc.)

In addition to the proposals prescribed under Elements Common to All Action Alternatives, the following management practices would be proposed:

Terrestrial Resources

▸ NATIVE PLANT & ANIMAL SPECIES

Tick Surveillance & Management

Under this alternative, the Tick Surveillance & Management protocols would be revised to enable the Seashore to implement proactive management strategies in areas of high use and high risk of exposure to reduce the human health risk. A range of low-impact methods would be employed to minimize the effects on other Seashore resources. Intensive public education and separation of the public from high-risk areas would also figure prominently in the strategy.

Mosquito Surveillance & Management

Under this alternative, the NPS would work collaboratively with Suffolk County Vector Control (SCVC) to revise the Mosquito Action Plan and Surveillance Protocols (Protocols) within the Seashore boundary consistent with the Seashore's Mosquito Surveillance and Management Program. The revised protocols would enable the NPS and Suffolk County to implement proactive management strategies in areas of high use and high risk of exposure to reduce human health risk. A range of low-impact methods would be employed to minimize the effects on other Seashore resources. Intensive public education would also figure prominently in the strategy.

Cultural Resources

Under this alternative, the NPS would place increased emphasis on research, documentation, interpretation, and preservation of cultural resources on Fire Island. The NPS would work with the New York State Historic Preservation Office (NYSHPO), Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to consider cultural resources in their island-wide as well as their regional context. The NPS would make a concerted effort to protect and interpret the Seashore's primary cultural resources and stories across Fire Island (e.g., Light Station complex, submerged resources, cultural traditions, evolutions of island development and uses over time) and would make technical assistance available to Fire Island communities that wish to inventory, protect, and interpret their historic and cultural assets. The NPS would complete the necessary research to fill in information gaps related to cultural resources, both terrestrial and submerged, on federal and non-federal lands, within the Seashore.

It is important to note that a separate set of management alternatives has been prepared for the William Floyd Estate and appear at the end of this chapter. While there may be an occasional reference to cultural resource management at the William Floyd Estate, this section focuses primarily on the cultural resources associated with Fire Island.

In addition to the proposals prescribed under Elements Common to All Action Alternatives, the following management practices would be proposed:

Research and Documentation of Cultural Properties on Fire Island

The NPS would collaborate with Fire Island communities and the towns of Islip and Brookhaven to develop a Cultural Landscape Report (CLR) that would consider Fire Island as a whole, including federal and non-federal tracts. The project would involve the preparation of a site history, description of existing conditions, and the identification and analysis of contributing landscape characteristics within the dynamic coastal environment. The CLR would provide essential information for protecting and interpreting Fire Island's cultural heritage.

The NPS would also work collaboratively with the NYSHPO and Fire Island communities that express an interest in undertaking a formal inventory of historic resources (including structures, landscape features, museum and archival collections, archeology, etc.).

Archeological Resources
The Seashore's Archeological Overview and Assessment (2005) identified a number of locations within the Fire Island communities where archeological resources may be present. The NPS would work with Fire Island communities to make them aware of such resources and to work with them to document them or otherwise secure the site and/or the information associated with them.

Museum and Archival Collections
The NPS would work with individuals and local groups possessing relevant historical and archival collections to conserve those collections and consider ways to make them more available to a wider audience. Methods may include offering workshops on the practical care and storage of historic and archival materials, and mounting temporary exhibits that highlight relevant local collections in the context of Fire Island's history.

Museum and Archival Collections – Curatorial Storage
The NPS would work to meet the needs of its growing collection, including museum and archival materials, natural history items, and archeological artifacts. Consistent with recommendations made in the Seashore's Collection Management Plan, under this alternative, the existing curatorial storage facility would be reorganized and expanded to meet the needs of the Seashore's collection, including additional space for cataloging and caring for the collection and an appropriate area for researchers to review materials. The existing interior space of the present curatorial storage facility would be reorganized and refurnished with more space-efficient, archival-quality storage units to maximize the use of the space. The improved facility would offer an outdoor panel exhibit to provide interpretation of the collection even when the curatorial storage facility is closed. An approximately 1,000-square-foot addition would be constructed to address additional storage, work, and research space.

Institutional Partners for Cultural Resource Management
The NPS would seek to strengthen the Seashore's relationship with the academic community, local and regional museums, historical societies and others to expand opportunities for collaboration in undertaking research, inventories, preservation initiatives, and interpretation.

Seashore Experience

Under this alternative, the Seashore experience would stress the connections between the natural and cultural environment and offer a more integrated visitor experience on Fire Island and at the William Floyd Estate. Through collaborating on programs and special events, the NPS would create more opportunities to

link experiences between Fire Island communities and the Seashore. The NPS would work to increase the distribution and dispersion of visitors across Seashore facilities and encourage a broad range of experiences.

The NPS and its partners would offer a diversity of opportunities – educational, recreational, water-based, land-based, interpretive, and virtual – that would be designed to engage diverse audiences that are representative of the tri-state area demographic, and delivered by a range of personal and non-personal services and media. The visitor experience would draw on regional connections to encourage visitors to seek out related resources on Long Island (e.g., Wertheim National Wildlife Refuge, Long Island Maritime Museum, the Manor of Saint George, etc.) to enhance their understanding of Fire Island.

Interpretive Emphasis

The interpretive focus would be on the Seashore's natural and cultural heritage ("life on the barrier island"). Interpretation would explore the historical importance of human settlement to the natural systems of Fire Island, Great South Bay, and the South Shore of Long Island. The natural ecologies here have been influenced and altered by people over the course of human history and will continue to be affected into the future.

Interpretive media and programs would emphasize the power of natural processes to shape this landscape. Because human actions may be having major impacts, interpretive programming would help Seashore audiences consider how we mitigate for those impacts, how we adapt to the conditions found in this dynamic environment, how we expect conditions to change in the future due to climate change, and finally, how we work together to address these questions. The public has an important role to play in creating positive outcomes by modeling good practices and educating others.

Public Information and Programs

The NPS would continue to maintain a robust web page on the NPS website (www.nps.gov/fiis) and reach out via social media to provide information on Seashore programs, recreational opportunities, resources, and management. Ranger-, partner-, and volunteer-led programs would continue primarily during the summer visitor season and would be available at most Seashore facilities on Fire Island and by invitation at other partner locations. Such programs would be offered year-round at Fire Island Light, the Wilderness Visitor Center, and at the William Floyd Estate. Visitor- or user-generated content and digital media (e.g., web info, downloadable smart phone and iPod/iPad applications, podcasts, video, etc.) and services (e.g., virtual exhibits and tours) in addition to physical exhibits, museums, and waysides would be utilized. Seashore brochures would also continue to be an important way to deliver a wide range of information on general Seashore orientation, specific sites, public safety, etc.

Educational & Community Outreach

The NPS would expand its educational and community outreach programs to make them available to a wider audience. Educational and community outreach would focus on natural and cultural processes and related issues, citizen stewardship programs, and schools and community groups. Offering off-site programming to meet the public where they live and emphasizing regional context and connections would be a fundamental interpretive strategy.

▸ VISITOR FACILITIES

Under this alternative, the major visitor service areas within the Seashore would be retained and the expansion of some areas would be considered. Existing facilities would be retained and, over time, would be improved and/or reoriented to be greener, more efficient, and better adapted to the coastal environment.

Patchogue/ Mainland Facilities

As in Alternatives 1 and 2, the Ferry Transportation Center would continue to serve the public with ferry service to the Seashore's Watch Hill facility, restrooms, multipurpose program space, changing and permanent indoor exhibits, and outdoor orientation exhibits. The NPS would work with Long Island Railroad (LIRR) and the ferry operators to encourage the use of public transportation and orientation of their Fire Island travel packages and marketing campaigns toward the use and enjoyment of the Seashore as a special place to be enjoyed and protected. A covered waiting/program area would be added to the existing deck adjoining the dock. During the shoulder seasons, the dock may accommodate visiting vessels such as the 1888 Oyster Sloop *Priscilla*, owned by the Long Island Maritime Museum.

Fire Island Light Station

As in Alternatives 1 and 2, operations and visitor programming at the Fire Island Light Station would continue to be managed by the Fire Island Lighthouse Preservation Society (FILPS) through a formal agreement with the NPS. Under this alternative, the NPS would work with FILPS to update exhibits to include expanded

interpretation of the Light Station's cultural landscape and natural features through the use of waysides and other interpretive media. The NPS would work with Robert Moses State Park and the local transit authority to make the West End Entrance Station a formal transit bus stop. Additional orientation and interpretive information would also be provided at the West End Entrance Station to aid visitors arriving by public transportation and could take the form of a panel mounted to the side of the building and/or expanded freestanding wayside exhibits at Field 5.

Sailors Haven/Sunken Forest

The NPS would develop a new master plan for the Sailors Haven/ Sunken Forest area that would re-envision it as a destination that relies on sustainable infrastructure and facilities to support recreation and outdoor education. The NPS would explore options for redesigning the Sailors Haven marina and ferry dock to minimize the downdrift impacts that have been causing erosion and undermining portions of the Sunken Forest.

The NPS would continue to maintain a lifeguarded beach on the ocean side at Sailors Haven.

The NPS would rehabilitate the Sailors Haven Visitor Center and would develop a sheltered group program area for groups of up to 50 people. Such proposed outdoor spaces would provide a staging area for walking tours, outdoor program space for large groups, as well as a location for evening programming. It would be located on previously disturbed lands.

The NPS would retain the current trail network and would work to upgrade the associated interpretive media. Interpretive signage along the Sunken Forest boardwalk trail would be updated and expanded.

Carrington Estate

Similar to Alternatives 1 and 2, the NPS would rehabilitate and use the historic Carrington house for administrative purposes. Under this alternative, the cottage may be used for an artist-in-residence program managed in partnership with local cultural institutions. The NPS would continue to maintain the boardwalks and the dune crossing to the west of the houses.

Talisman

At Talisman, the NPS would provide for a lifeguard-protected beach on the ocean side as funding permits, and existing recreational facilities (e.g., restrooms, bathhouse) would be retained. Interpretive programming would be offered as staffing permits. The current boat dock would be retained as would the existing sun shelters and picnic areas, waysides, and informational bulletin boards.

Watch Hill

As in Alternative 2, NPS would develop a new Master Plan for Watch Hill that would guide the removal or rehabilitation of outdated facilities, enhance site circulation, identify appropriate space for visitor contact activities, interpretive and educational programming, exhibits, and retail sales, and improve operational efficiencies.

The Watch Hill marina and ferry dock would be retained. The marina facilities, campground, and the bathhouse as well as ferry service would continue to be operated through concessions agreements awarded through a competitive process to a private enterprise. The NPS would continue to maintain the life-guard-protected beach and the extensive system of boardwalks that traverse the maritime forest and salt marsh at Watch Hill.

The NPS would also consider rehabilitating and reusing the current restaurant space for educational programming, perhaps considering a seasonal arrangement enabling its use for educational purposes during the shoulder seasons and its continued use as a restaurant during the summer season.

Informational signage identifying the Fire Island Wilderness would be installed at various points of entry.

Residential Environmental Education Program

The NPS would work collaboratively with one or more partners to reestablish a residential environmental education program. The education program could be located at one of the Seashore's developed areas and would be a small-scale, formal program that is a destination for day-use and overnight participants of all ages and backgrounds to learn about the ecology of Fire Island. The program would be housed using existing facilities that are available during the Seashore's shoulder seasons. Most of the structures at Sailors Haven and Watch Hill would be readily available and would require few, if any, modifications. At Talisman, the existing hotel would need to be completely rehabilitated to accommodate this use.

This program would be a collaborative venture and would not be undertaken until the appropriate partnerships have been forged and a significant proportion of the resources necessary to undertake and sustain the project are in place.

Wilderness Visitor Center

At the eastern gateway of the Fire Island Wilderness, the Wilderness Visitor Center would be rehabilitated to improve universal access to the facility. Permanent exhibits orienting visitors to the Fire Island Wilderness and other facets of Fire Island National Seashore would be installed.

The existing parking corral would be improved, enabling more efficient use of the space and providing for designated handicapped parking. The Seashore would work with Suffolk County to make overnight parking available at the Smith Point County Park.

► RECREATIONAL USES

As in Alternative 1, a wide range of recreational opportunities would continue to be available at Fire Island. Activities that enable visitors to make a greater connection to the Seashore as a whole and its wider regional context would be encouraged. Expanded opportunities to engage in educational programming within the Seashore and in programming offered jointly with other institutions throughout Suffolk County would be available to Seashore visitors.

Lifeguarded Beaches

The NPS would provide for life-guard-protected beaches in high use areas including Watch Hill, Sailors Haven, and Talisman as funding allows. The scale of the life-guarded beach could be adjusted in response to increasing or decreasing levels of use. Restrooms would be provided in relation to these beaches.

Kayaking/Canoeing

The NPS would continue Watch Hill guided trips as in Alternative 1 and add route(s) through shallow waters on the bay side. Water routes could also be expanded to include a larger regional experience and linking a number of destinations including Wertheim National Wildlife Refuge, the Fire Island Wilderness, and Watch Hill. The development of a water route would be undertaken by the NPS with the support of the NPS's Rivers, Trails, and Conservation Assistance (RTCA) program. The NPS would identify canoe/kayak landing locations, provide a water trail guide or brochure, and offer occasional guided experiences. The operation of the water route including the maintenance of buoys and markers, guides and brochures, canoe and kayak rentals, and guided tours could be undertaken through a concession agreement that would be competitively awarded to a private enterprise.

Beach Camping in Front of the Wilderness Area

Under this alternative, camping on the beach would continue to be permitted and the total number of people permitted to camp in either the Wilderness Area or on beach in front of the Wilderness Area would increase.

- No more than 72 people may camp in the Fire Island Wilderness zones and the Great South Beach zones combined. Camping on the beach is permitted annually from March 15 through Labor Day.
- In addition to those permitted to camp in the Wilderness from March 15 through Labor Day, no more than 36 people may camp on the beach.
  - » No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern Zone of the beach in front of the Fire Island Wilderness.
  - » No more than 24 individuals in no larger than groups of 8 per campsite in the Western Zone of the beach in front of the Fire Island Wilderness.
- No more than 36 people may camp in the Fire Island Wilderness zones year round.
  - » No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern Zone of the Fire Island Wilderness.
  - » No more than 24 individuals in no larger than groups of 8 per campsite in the Western Zone of the Fire Island Wilderness

Transportation

▸ LAND-BASED ACCESS

As in Alternative 2, the NPS would work with others to improve bus and non-motorized connections to Fire Island and enhance visitor awareness of train and bus connections.

Inter-community Bicycle Working Group

The NPS would convene an inter-community bicycle working group to consider the specific benefits and impacts of expanding the use of bicycles as a lateral transportation option, particularly during the shoulder seasons. The working group would include representation from the Fire Island communities, the towns of Islip and Brookhaven, ferry operators, and the NPS to address the types of bicycle use and under what circumstances it would be accommodated. The working group would produce recommendations on how to best accommodate cycling and what level of bicycling would be feasible on Fire Island.

▸ WATER- BASED ACCESS

Ferry Service

The NPS would work with the ferry companies currently servicing the Seashore and others to improve service to NPS sites by expanding service during shoulder season to specific destinations. The NPS would also work with the ferry companies to permit the transport of bicycles and kayaks on passenger ferries. The NPS would work with the Seashore's ferry concessions and others to explore the possibility of providing a subsidy to reduce fares or offer a waiver, particularly for underserved school districts and low-income families.

Private Boaters

As in Management Alternative 1, slips at Sailors Haven and Watch Hill would continue to be available on a first-come, first-served basis. The limited reservation system at the Watch Hill marina would continue. The NPS would continue to impose a 14-consecutive-day limit on marina docks on all overnight stays. Boats would continue to be able to moor off shore.

Improve Water-Based Access

The NPS would work with Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to expand opportunities for water-based facilities on Fire Island that can accommodate the movement of goods and services (e.g., cargo/ materials delivery; debris removal, etc.).

Lateral Transportation Services

The NPS would work with the ferry companies and other stakeholders to increase service to NPS sites and explore ways to expand lateral water taxi service and try to make it more affordable.

Operations And Maintenance

Under this alternative the scope and function of the operation and maintenance of the Seashore would be adjusted consistent with the new changes and requirements proposed under this alternative. Additional facilities proposed for Sailors Haven would require operation and maintenance by the Seashore. Some replacement structures developed on Fire Island may be seasonal and removable, requiring significant effort at the beginning and close of each visitor season as well as off-season storage. Greater emphasis would be placed on improving energy efficiency and making use of alternative technologies to power facilities and address transportation, wastewater, and waste management needs, as well as increasing resilience to climate change and sea-level rise.

Staff Housing

Under this alternative the NPS would continue to maintain and make housing available to Seashore and concession employees for rent at fair market rates consistent with DOI and NPS housing management standards. Seashore housing would also continue to be available to researchers on an as-needed basis and would continue to be dispersed throughout the Seashore at the following locations: Fire Island Light Station, Sailors Haven, Carrington, Talisman, Watch Hill, and the William Floyd Estate.

At Sailors Haven, Talisman, and Watch Hill the use of seasonal, removable structures would be considered for seasonal staff housing.

At Talisman, one of the two existing housing units is currently located in front of the CEHA line. This house would be removed from its present location and, if feasible, relocated to a more appropriate location on the site. These housing units would continue to be available for staff housing or other administrative purposes. At Watch Hill, one unit of housing is located in a sensitive area. Similar to what is proposed for Talisman, it would be removed from its present location and, if feasible, relocated to a more appropriate site. The Seashore's Housing Plan would be updated to be consistent with the final approved GMP.

Boat and Ferry Docks
Same as Alternative 1.

Trash Transfer Stations/ Waste Management
Same as Alternative 1.

Ranger Stations
The Ranger Stations would continue to be located at Fire Island Light, Sailors Haven, Watch Hill, and the Wilderness Visitor Center.

Lifeguard Facilities
These facilities typically include a changing room, showers, lockers, and storage for gear and are associated with the lifeguard-protected beaches. Under this alternative, these facilities would continue to be located at Sailors Haven and Watch Hill. A new lifeguard facility would be developed at Talisman, considering adaptive reuse of an existing building, as funding allows.

Fire Island Light Station Operations/Kismet Fire House
Same as Alternative 1.

Park Administration

Like Alternatives 1 and 2, under this alternative the Seashore would continue to operate its facilities and provide for public programming and visitor safety by relying on a combination of NPS staff, volunteers, partners, cooperators, and commercial service providers. Most resource management, land-use planning and regulation, law enforcement and emergency response functions would continue to be undertaken by Seashore and other NPS staff in collaboration with other relevant agencies and organizations.

Staffing
Supplemental to the proposed additions to the Seashore staff described under Alternative 1, up to six other positions would be required to meet the demands of this alternative, with an increased focus on cultural and natural resource management, planning, and community and educational outreach.

Commercial Services
The NPS would continue to employ concessioners to provide regular ferry service seasonally from Long Island to Seashore visitor facilities on Fire Island and to manage the public facilities at Sailors Haven, Talisman, and Watch Hill. The concessions would be awarded on a competitive basis at regular intervals. Seashore staff would continue to be responsible for monitoring the concessions to ensure that the terms of concession agreements are being met.

Cooperators
The NPS would continue to rely on a cooperating association, The Fire Island Lighthouse Preservation Society, to operate and maintain the Fire Island Lighthouse and provide visitor services to the public. The NPS would work with the Society to explore the possibility of expanding its role and responsibilities in interpreting the cultural heritage of all of Fire Island. The NPS would also continue its relationship with Eastern National (EN) or similar cooperating association for management of sales outlets at various locations throughout the Seashore including Watch Hill, Sailors Haven, Wilderness Visitor Center, and the William Floyd Estate.

The NPS would seek appropriate cooperators to develop, operate, and manage the residential environmental education program as well as the proposed artist-in-residence program. An appropriate cooperator would most likely be an academic institution or an environmental organization.

Partners
The NPS would develop a more extensive network of partners to help operate, manage, interpret, and support the Seashore and assist Fire Island communities and towns with ecologically sound practices (e.g., gardening, water features), historic preservation, collecting data on local history, community visioning, etc. Partners could include -- but certainly would not be limited to -- such institutions and organizations as the Western Suffolk Board of Cooperative Educational Services (BOCES), Cornell Cooperative Extension, and the Society for the Preservation of Long Island Antiquities (SPLIA). As the NPS engages in new activities, it would look for opportunities to engage in partnerships to achieve the objectives of each new initiative.

Legislative Requirements

Acknowledging Cultural Heritage of the Island
The Seashore's enabling legislation would be amended to include language acknowledging that Fire Island possesses significant *cultural resource* values, as well as natural resources that must be considered in the management of the park.


Service Entry
Visitor Exit
Cemetery
Historic
House & Grounds
Refer to "Core Area" Map for Detail
Moriches
Bay
Home Creek
Indian
Point
Core Way
Visitor
Entry
Park Road
Lower
Acreage
The Vista
Lawrence Creek
VILLAGE OF
MASTIC
BEACH
Narrow Bay
FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN
MAP 2-C WILLIAM FLOYD ESTATE
EXISTING CONDITIONS
Fire Island National Seashore
Public Access Road (Paved)
Trail
Mosquito Ditch
Historic Structure
Park Support Structure
Parking Area
Point of Entry
Hedge
Field / Lawn
Woodland
Marsh

The William Floyd Estate

INTRODUCTION: The William Floyd Estate (the Estate) is a separate and distinct unit of Fire Island National Seashore with its own unique characteristics. To properly address the future needs of the Estate, workshops and alternative planning concepts were developed separately from the overall planning effort for Fire Island National Seashore. Occupied by the Floyd family and descendants from 1720 to 1976, the Estate was the home of General William Floyd, a signer of the Declaration of Independence. The interpretive themes for the Estate have been identified as follows:

Three Centuries of Change at the Floyd Estate

The Floyd family's personal stories and 250-year residency at the Floyd Estate in Mastic Beach provide a lens through which to understand the dynamic social, economic, and political changes over that time on Long Island and throughout the nation.

The Life and Times of a Patriot

As a signer of the Declaration of Independence, William Floyd, prominent New York political leader and wealthy plantation owner, provides a personal perspective on the risks to life, property, and reputation associated with being a patriot in New York during the War for Independence.

Some key questions and priorities guided the planning process for the William Floyd Estate. At the very core of planning for the Estate was the following question: *How can the National Park Service provide a balanced strategy for management at the William Floyd Estate that accommodates expanded hours, programming, and outreach while ensuring resource protection and a high-quality visitor experience?*

This question was refined through the course of two planning workshops held with key stakeholders associated with the property and the surrounding community. These workshop participants also helped to define the following critical planning priorities for the Estate:

- **Defining the Message** – Work with other entities to develop a consistent message that defines the Estate's significance, themes, and objectives and also broadens understanding and appreciation of the William Floyd Estate locally, nationally, and globally and within the context of Fire Island National Seashore and the national park system.
- **Education Destination** – Establish the Estate as a place for research and education. Become a living classroom that builds understanding for the cultural and historical significance of the property through engaging, hands-on activities and tangible examples of the historic uses of the site.

- **Access** – Ensure the Estate is easy to find and available to the public on a regular basis. Provide a facility that orients visitors and provides space for educational programs throughout the year.
- **Health, Safety, and Security** – Ensure that visitors have a safe and healthy visitor experience that fosters their understanding and appreciation of the Estate. Create an appropriate monitoring and security system to ensure the site's long-term protection.
- **Improving Relationships** – In collaboration with others, establish a broad range of diverse and lasting partnerships with other sites, institutions, and museums that encourage educational opportunities for a wide array of audiences and foster long-term stewardship of the property.

ELEMENTS COMMON TO ALL ALTERNATIVES

A series of Elements Common to All Alternatives has been developed specifically for the William Floyd Estate. These elements are so important to management of the Estate that they would be applicable regardless of which management alternative is selected.

In addition, there are a number of key actions included in the draft GMP/EIS alternatives that would also be relevant to the Estate and are also considered fundamental to its management. These common proposed actions span a number of Seashore management topics from general resource management through Seashore administration. Though described in greater detail earlier in this chapter, they include:

Resource Management – In General

- Greater Scientific and Scholarly Research
- Expanded Opportunities for Public Involvement in Research and Scholarship
- Catalogue of Natural and Cultural Data and Research Needs

Natural Resource Management

- Addressing the effects of Climate Change on Native Species
- Management Plan for Non-Native Invasive Species

Cultural Resource Management

- Archeological Overview and Assessment for Submerged Archeological Resources

Seashore Experience

- Broaden Visitor Base at Fire Island National Seashore
- Educational Outreach to wider audience
- Sustainability Role Model within the region

Park Administration

- Cooperative Stewardship

In addition to the elements described above, a number of current practices described under Management Alternative 1 – Continuation of Current Management Practices (No Action) would generally continue regardless of the management alternative ultimately adopted as a result of this process and would also apply to the William Floyd Estate. Though these practices are described in greater detail under Management Alternative 1: Continuation of Current Management Practices (No Action). They include:

Natural Resource Management

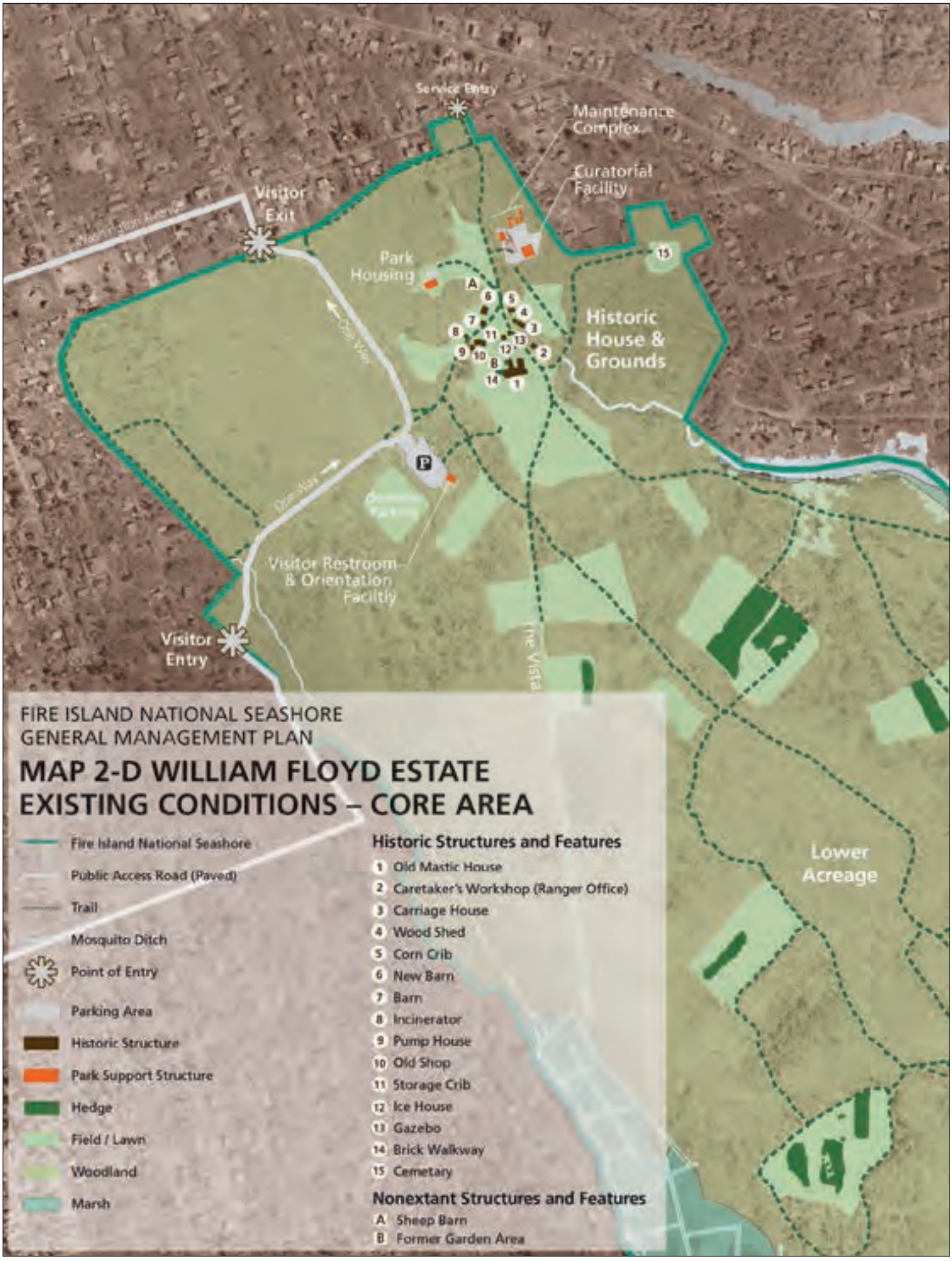
- Resource Stewardship Planning
- Threatened & Endangered Species Planning, Monitoring, and Protection
- Management of Native Plant and Animal Species
- Tick Surveillance and Management
- Resource Stewardship – Public Education and Outreach
- Management of Non-native Invasive Plant and Animal Species
- Enhancing opportunities for observing the natural night sky
- Protecting Freshwater and Saltwater marshes

Cultural Resource Management

- Development of a predictive model and testing strategy to record prehistoric sites within the Seashore
- Documentation and protection of submerged archeological sites revealed by erosion
- Establishment of enhanced working relationships with the Poospatuck Unkechaug tribe and the Shinnecock Indian Nation

Seashore Maintenance and Operations

- "Greening" of park operations and facilities
- Ensure that NPS facilities are universally accessible to the greatest degree possible


Service Entry
Maintenance Complex
Curatorial Facility
Visitor Exit
Park Housing
Historic House & Grounds
Visitor Restroom & Orientation Facility
Visitor Entry
Lower Acreage
FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN
MAP 2-D WILLIAM FLOYD ESTATE
EXISTING CONDITIONS – CORE AREA
Fire Island National Seashore
Public Access Road (Paved)
Trail
Mosquito Ditch
Point of Entry
Parking Area
Historic Structure
Park Support Structure
Hedge
Field / Lawn
Woodland
Marsh
Historic Structures and Features
1 Old Mastic House
2 Caretaker's Workshop (Ranger Office)
3 Carriage House
4 Wood Shed
5 Corn Crib
6 New Barn
7 Barn
8 Incinerator
9 Pump House
10 Old Shop
11 Storage Crib
12 Ice House
13 Gazebo
14 Brick Walkway
15 Cemetary
Nonextant Structures and Features
A Sheep Barn
B Former Garden Area

- Provision of staff housing to meet operational needs
- Expansion of network of partners and cooperators
- Demarcation of the Seashore's landward and seaward boundaries

Cultural Resource Management

Additional information about the William Floyd Estate is needed to broaden educational programming and to help ensure accurate preservation and interpretation at the site. Informational gaps would be filled by completing such documents as the Estate's Cultural Landscape Report, implementing an archeological program, and working with others to undertake an ethnographic assessment to obtain more information related to the Estate's ethnographic resources and associations (e.g., enslaved people, indentured servants, and other workers). The NPS would work to acquire additional information about the local Native American associations with the Estate.

Historic Structures

The existing historic structures, including the Old Mastic House and its associated outbuildings, would continue to be preserved and interpreted. The Caretaker's Workshop would continue to serve as an office for staff on the property.

Complete Stabilization of the Old Mastic House

NPS would undertake work to correct structural issues at the Old Mastic House, including installation of structural supports in the basement and repair of other structural elements. The proposal for the stabilization of the Old Mastic House has been submitted and approved for funding within the NPS Project Management Information System.

Historic Furnishings Implementation Plan for Old Mastic House

The NPS has recently completed a Historic Furnishing Report (HFR) for the Old Mastic House. In response to the HFR recommendations, the NPS would prepare a Historic Furnishings Implementation Plan that would include an operating plan, recommended list of furnishings, and schematic floor plans.

Cultural Landscape

The NPS would prepare a Cultural Landscape Report (CLR) and Treatment Plan for the Estate. Consistent with the recommendations of the CLR and Treatment Plan, the Lower Acreage would continue to be managed as a cultural resource and would be monitored to retain its natural resource values. The historic cemetery would continue to be preserved and maintained.

Museum & Archival Collections

The NPS would continue working with the Floyd family descendants and others related to the Estate to enhance its collections and our knowledge of the property.

Contact with Floyd Family Descendants

The NPS would maintain its contact with descendants of the Floyd family and seek to expand its contacts with other people historically associated with the Estate in order to broaden interpretation of the place, augment the artifact collection, and deepen our understanding of the Estate and its linkages to related sites.

Natural Resource Management

In addition to proposed Seashore-wide natural resource management actions described as Elements Common to All Alternatives, the following proposed common actions are particular to the William Floyd Estate.

Native Plant & Animal Species

The NPS would undertake additional research to obtain more information on the abundance and spatial distribution of flora and fauna such as white tail deer *(Odocoileus virginianus)* and eastern box turtles *(Terrapene carolina carolina)*.

Tick Monitoring & Management

The NPS would continue its program of tick surveillance and management at the William Floyd Estate. Tick monitoring and management at the Estate continues to be consistent with the Seashore's Tick Monitoring and Management Protocol established in 2008. Tick monitoring would typically commence in the spring when staff begin to observe growing numbers of ticks. Seashore staff would actively monitor the tick population at five specific sites on the Estate.

Consistent with the Tick Monitoring and Management Protocol, the decision to manage tick populations by chemical means would continue to depend on the abundance, species composition, and life stage of ticks in high-traffic areas for employees and visitors. The following would be considered before any application to control ticks:

1. the tick composition strongly suggests that there is an imminent disease risk to people; and

2. the risk of disease transmission to humans will be reduced by the intervention (i.e. the tick abundance will be reduced below the established threshold by the application); and
3. tick population management at the William Floyd Estate is more effective than other available approaches to managing this disease risk (e.g., education, personal protective equipment, etc.).

Mosquito Surveillance & Management

The NPS would continue to engage in a regular program of mosquito surveillance based on the existing Mosquito Surveillance and Management Protocols (Protocols). These would be updated annually in collaboration with county, state, and federal organizations, including Suffolk County Vector Control (SCVC), Suffolk County Department of Health Services, and the United States Geological Survey (USGS) and would be consistent with an approved Mosquito Management Plan completed by Suffolk County.

The SCVC would continue to manage mosquitoes using pesticides within Smith Point County Park and private communities located within the boundaries of Fire Island. The SCVC operates its program within the National Seashore under a Letter of Authorization from the National Park Service. The SCVC would continue to be restricted from using any form of pesticides on the federal tracts of Fire Island and the William Floyd Estate as per management policies documented in the Protocols. As on Fire Island, in order to maintain and preserve the environment within the William Floyd Estate, NPS policy states that mosquito management interventions would be applied on the Estate only if the presence of West Nile Virus (WNV) and/or Eastern Equine Encephalitis (EEE) in or near the Estate, is strong enough to suggest disease risk to humans and the risk of disease transmission would be substantially lowered by the intervention.

Fire management planning

In the recent past, woodland fires have put the Old Mastic House, outbuildings, and collections at risk. Likewise, fire has been used historically as a management tool to maintain the fields on the Lower Acreage. The NPS would complete plans that would address the risk of wildland fire (i.e., any nonstructural fire, other than prescribed fire, that occurs in the wildland) on the Estate and consider the use of prescribed fire in the management of the cultural landscape. The effect of climate change on wildland fire risk would be considered in the fire management plan.

Management of Non-Native Invasive Plants

The NPS would continue efforts to control or eradicate non-native invasive plants consistent with the guidance provided by the Cultural Landscape Report and Treatment Plan

Maintenance of the Mixed Habitat Complex

The NPS would maintain the existing mixed habitat complex of field, forest, wetland, and marsh presently found on the Estate and would rely on the Cultural Landscape Report and Treatment Plan to provide guidance on preserving the cultural values associated with the landscape.

Visitor Experience & Interpretation

Interpretive emphasis

The time period for interpretation would continue to be 1724 to 1975, with an emphasis on the continuum of family occupancy and how the Floyd family reflects important themes of American history within a local, national, and global context.

Educational Outreach

Educational programming regarding the William Floyd Estate is an important means for enhancing public enjoyment, building appreciation and fostering stewardship of the Estate and related area resources. The NPS would work with others to make the Estate an educational destination for diverse audiences and expand programs and events using a variety of methods and media.

Special programs and exhibits would continue to support the interpretation of the Estate. Such programs may include but are not limited to music performances, lectures, and temporary exhibits.

The NPS would develop an outreach initiative to make the Estate and its history better known locally, regionally, and nationally. To do this effectively, the Estate's hours and season of operation would be expanded, as funding becomes available.

Links to Related Sites

The NPS would develop connections to related local, regional, and national sites. Such sites may include the homes of other Signers of the Declaration of Independence (e.g., Adams NHP), related estates on Long Island (e.g., the Manor of St. George), historical museums (e.g., Suffolk County Historical Society museum), and natural areas such at Wertheim National Wildlife Refuge. The NPS would work with these related entities to undertake events, programs, and special tours


Service Entry
(Entry Restricted by Federal Permit)
Visitor Exit
Visitor Entry
Moriches Bay
Home Creek
Washington Avenue
Orchid Drive
Mastic Beach Road
Wheeler Drive
Park Road
Neighborhood Road
66 / 7E
William Floyd Estate
Village of Mastic Beach
Narrow Bay
27A
46
William Floyd Parkway
Westhampton National Wildlife Refuge
William Floyd Estate
Neighborhood Road
Not to Scale
FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN
MAP 2-E WILLIAM FLOYD ESTATE CIRCULATION
Fire Island National Seashore
Public Access Road (Paved)
Point of Entry
Parking Area
Bus Stop
Visitor Parking

(e.g., holiday tours, historic craft events, films, lectures) that further visitor understanding of the Estate and its geographic and historical context.

Circulation and Access

Way finding

Working in conjunction with the village of Mastic Beach, the town of Brookhaven, and Suffolk County, the NPS would improve way finding to the William Floyd Estate through diverse means. These would include signs, maps, and other information located at key places in the area. The information would also be posted on the web. Digital technologies would be used to distribute information and orient visitors.

Access/Egress

The existing entry and exit roads at the Estate would remain the same, with signage on local roads improved to direct people easily to and from the Estate through the Village of Mastic Beach. For large-scale special events, the NPS would work with the local community and other entities to provide off-site parking with shuttle service to and from the Estate.

Operations and Maintenance

Staff Housing

NPS staff would continue to reside in housing on the William Floyd Estate to increase the after-hours presence and security on the Estate.

Partnerships

Partnership Strategy for the William Floyd Estate

The NPS would work with new and existing partners to develop a strategic partnership plan to advance resource management and interpretation goals at the William Floyd Estate. The NPS would strive to integrate the local community and related entities so they become a vital part of the Estate's stewardship and expand the number of volunteers to assist in a multitude of ways. Partnerships would also be expanded for research, programming, and outreach and include the Native American community and such entities as area libraries, schools (pre-school to university), historical societies, youth groups, and other interest groups or entities with connections to the Estate.

Collaborative Research & Programming

The NPS would work with the Town of Brookhaven (particularly its Department of Parks, Recreation, Sports, & Cultural Resources), the Society for the Preservation of Long Island Antiquities (SPLIA), the Suffolk County Historical Society, and other relevant organizations to undertake research and develop programming that reflects the significance and primary interpretive themes of the William Floyd Estate.

Administration

The William Floyd Estate would continue to be managed as a discrete unit of Fire Island National Seashore, with numerous volunteers trained and scheduled to provide interpretive tours of the Old Mastic House.

Management Alternative A:

THE ESTATE'S CURRENT MANAGEMENT *(No-Action Alternative)*

Management Alternative A – The Estate's Current Management is the No-Action alternative. Under the No-Action alternative, current management practices and the use of approved and interim plans would continue. The NPS would continue to collaborate with local, county, and state officials on an as-needed basis to address policy and management issues. The Estate would continue to meet day-to-day operations, management, legal, and regulatory requirements based on existing plans and the availability of funds.

In addition to the proposals prescribed under Elements Common to All Alternatives, the following management practices would continue:

Cultural Resource Management

Historic Structures

The Old Mastic House would continue to be preserved and furnished to reflect the family's use and occupancy. While most of the rooms would reflect changes at the Estate over the last 250 years, one room would continue to serve as an introductory exhibit space, while another would serve as a small sales area.

Museum & Archival Collections

A number of museum objects would continue to be displayed in the Old Mastic House. The NPS would continue to house and maintain an extensive collection of archival and museum items related to the Estate at the curatorial storage facility located on the property. Other museum objects would also continue to be stored in the non-public areas of the Old Mastic House and in one or more outbuildings.

Visitor Experience, Interpretation, and Education

The primary visitor experience at the William Floyd Estate would continue to be a small-group, guided tour of the historic Old Mastic House. House tours would be available during the visitor season, from Memorial Day through mid-November on Fridays, weekends, and holidays.

Visitors would continue to be guided through 25 furnished rooms by a ranger or a volunteer describing the changes in the land, the house, and the family over their 250 years of occupancy at the home. Tour size would continue to be limited to a maximum of 12 visitors per tour with 13 tours being offered per day during normal business hours. The number of tours given may increase on special event days.

Self-guided walking tours would continue to be available to visitors wishing to see the historic outbuildings, cemetery, and the Lower Acreage.

Estate educational programs would continue to be curtailed due to a variety of reasons such as health and safety concerns (e.g., ticks, poison ivy, mosquitoes) and the lack of appropriate facilities and staffing.

Thematically relevant programs as well as nature walks would also be offered year-round, as staffing and conditions permit.

The orientation and sales space would continue to be located inside the Old Mastic House. Restrooms would continue to be located away from the historic core in a small facility near the existing parking lot.

Circulation & Access

Visitors would continue to use the existing entrance road that guides them to a parking lot and restroom facility in the northwest section of the William Floyd Estate. The parking lot would continue to be connected with a boardwalk system through the woods to a grass clearing at the Old Mastic House. A nearby cleared area would continue to be available for event overflow parking.

The network of unpaved roadways throughout the Estate would be retained, many of which would be marked and keyed to a visitor map to facilitate way finding.

Operations & Maintenance

A small collection of aging maintenance sheds in the northeastern section of the Estate would continue to serve as the storage and preservation area for all Estate maintenance and operational activities. These facilities would also continue to support maintenance and operations at NPS facilities on the east end of Fire Island.

Management Alternative B:

HISTORICAL PARK AND MUSEUM

(NPS Preferred Alternative)

This alternative would advance the vision of the William Floyd Estate as a historical park and museum where visitor activities and experiences would focus on understanding and appreciating the historical relevance of William Floyd and his descendants, the evolution of the site from agricultural plantation to recreational retreat, and the political, social, and economic forces that shaped this family and their use of the property. The value of the Estate as a large area of undeveloped land in a developed community would be more fully recognized.

Cultural, natural, and recreational opportunities would be expanded, as appropriate within the context of the Estate's purpose and significance. The interpretative emphasis would be broadened to embrace more of the property's historic regional context, with more collaborative exhibits and programming taking place with other institutions, both on and off-site.

Cultural Resource Management

The historic core (Old Mastic House, surrounding grounds, cemetery) would be preserved in a manner that supports interpretation of the continuum of the Estate's multi-generational history.

Historic Structures

In the Old Mastic House, the orientation exhibit and sales area would be removed, and all the spaces in the home would be furnished to illustrate the continuum of family use. The existing structures and selected landscape features (e.g., garden, portions of the orchard) within the historic core would be rehabilitated and interpreted. Relevant missing structures and features would be interpreted to help visitors understand the Estate's history.

Cultural Landscape

In the Lower Acreage, the existing cultural landscape features (e.g., fields, marshlands, the Vista, ponds, remnants of the corduroy road, and lopped tree fence system) would be retained and rehabilitated. Landscape vignettes (e.g., introduction of cultivated fields in some locations) would be created to evoke different periods in the Estate's history in support of interpretive objectives.

Roads and trails would be rehabilitated to support additional recreational use, making use of the best practice methods and materials.

Archeological Resource Management Plan

The NPS would undertake a comprehensive archeological resource management plan for the Estate that would consider previously conducted archeological investigations on the property. The NPS would conduct a systematic archeological survey to delineate a complex series of interrelated resources consisting of dwellings, outbuildings, quarters, and other landscape features.

Visitor Experience, Interpretation, and Education

Visitor Orientation

For many, the visitor experience at the Estate would begin at a rehabilitated visitor facility located near the existing parking area. This facility would build upon existing visitor infrastructure including restrooms and an orientation kiosk and would provide a versatile and safe indoor orientation and program space for a variety of audiences, but particularly school children. Concerns about exposure to tick-borne illnesses and adverse weather conditions at the Floyd Estate have discouraged educational visits to the property. Indoor and outdoor program spaces would be available for day and evening programs as well as a place to orient and stage school groups and provide a sheltered area for lunch.

At the facility, visitors would have the opportunity to see an introductory multimedia presentation, use the restroom, and talk with a park ranger or volunteer to plan their visit. Visitors would also have an opportunity to view an orientation exhibit that interprets the historic evolution of the property as well as other relevant changing exhibits. The proposed facility would also enable the NPS to remove non-historic functions from the Old Mastic House.

Village-based Visitor Orientation

The NPS would also work in collaboration with the Village of Mastic Beach to explore the possibility of creating an off-site orientation exhibit about the Estate in a village-based location, possibly the Village's proposed welcome center. The proposed off-site orientation exhibit would be located along Neighborhood Road and would perform a gateway function, augmenting improved signage by providing information and assistance to visitors traveling to the Estate

Interpretive Emphasis

Interpretation and educational programming would emphasize regional and community connections to the Estate in historical, cultural, and physical terms. A strong focus would be placed on working with area school districts to tie on-site school programs to the state and national education standards. In addition, a variety of programs would be provided that encourage families of diverse interests and backgrounds to make return visits to the Estate.

Interpretation would be intertwined with recreational activities throughout the site. Walking, hiking, birding, and photography and related activities would be encouraged. The NPS would create a wildlife observation point (e.g., a blind or a small platform) in the northern section of the marsh near one of the ponds in the Lower Acreage. Access to the observation point would be along rehabilitated historic footpaths.

Tours of the Old Mastic House would be scheduled and ticketed to manage the volume and flow of visitors through the house. Visitors would also have the opportunity to explore other structures and features within the historic core, see an exhibit at the expanded curatorial storage facility, and walk along the historic system of roads and trails to learn about the Estate's grounds from a historical perspective. Landscape vignettes that visually illustrate the Estate's cultural past would be created to support its interpretive objectives and help visitors understand its historic evolution.

Landscape vignettes may include a planted agricultural field, garden, or other landscape feature illustrative of an important period in the Estate's history. Landscape vignettes would be designed to be consistent with any CLR recommendations and to support interpretive objectives for the Estate. Because the Floyd family was active in natural resource conservation, the NPS would also highlight the Estate's natural landscape and its flora and fauna as well as its natural history.

Non-personal interpretive media (such as a self-guided walking tour brochure, audio tour, or digital media) would be available to visitors and would provide important information on safety while touring the site (e.g., ticks and poison ivy) and interpret the different periods in the Estate's history. Digital media options may also include virtual exhibits highlighting the Estate's museum collection and virtual tours of the Old Mastic House and grounds.

Access and Circulation

Way finding

The directional signage system guiding visitors to the Estate and back through the Village of Mastic Beach would be improved. The Estate's existing road system would be retained; however, the existing parking lot would be reconfigured to accommodate the rehabilitated facility. As a result, parking may need to be relocated to portions of the current overflow field. Additional overflow parking may need to be identified to accommodate demand during special events.

The current boardwalk may need to be realigned in certain areas to better connect the proposed visitor orientation facility to the Old Mastic House.

Operations & Maintenance

Consolidated Maintenance Facility at William Floyd Estate

Building upon the existing maintenance shop, the NPS would develop a consolidated maintenance facility at the Estate and house the primary functions within a single structure. The consolidated facility would offer safe and sufficient space to support the maintenance and preservation operations for the Estate as well as the east end of the Seashore.

Space would be provided for the Estate's administrative and site staff at the rehabilitated orientation facility. The caretaker's workshop would continue to be staffed as a ranger and visitor contact facility to support the additional activities that occur on the property.

Administration

Operating Season and Hours

The historic grounds and the upgraded orientation facility would be open to the public year round, with days and hours of operation varying seasonally. The Old Mastic House would continue to be open seasonally. The extension of the operating season and school programming would be contingent upon the availability of funding.

Park Boundary

The NPS would undertake a study to consider adjustments to the western boundary of the William Floyd Estate for purposes of regularizing the boundary, improving resource protection, and enhancing the "gateway" experience for visitors to the property.

COST ESTIMATES FOR THE ALTERNATIVES

Once approved, the GMP provides a framework for coordinating and integrating subsequent planning and management decisions affecting Fire Island National Seashore. When funds become available to implement specific plans or individual actions consistent with the approved GMP, site-specific planning, research, and environmental analysis will take place. Specific actions will be subject to all applicable compliance requirements including federal and state consultation requirements, and the public will be involved throughout the process.

The presentation of costs within the draft GMP/EIS is applied to the types and general intensities of development in a comparative format. The costs are presented as estimates that allow for flexibility in application of components and are not appropriate for budgeting purposes.

The costs presented have been developed using industry standards to the extent available. Actual costs will be determined at a later date, considering the design of facilities, identification of detailed resource protection needs, and changing visitor expectations. The cost estimates presented represent the total costs of projects. Potential cost-sharing opportunities with partners would reduce overall costs.

Facility costs related to Alternative 1 include the rehabilitation of the Sailors Haven Visitor Center and connections to county water services on Fire Island, and the stabilization of the Old Mastic House at the William Floyd Estate. Alternatives 2 and 3 include facility costs as described under Alternative 1. Facility costs under Alternative 2 also include the demolition and removal of existing facilities, related landscape restoration work, the relocation of the campground, and the construction of covered, outdoor program space on Fire Island. Under Alternative 3, facility costs also include the expansion of the Seashore's curatorial storage facility, rehabilitation of existing space for educational programming, and the development of covered outdoor program spaces on Fire Island and at the Patchogue Ferry Terminal. Under Alternatives 2 and 3, facility costs associated with the William Floyd Estate include the rehabilitation of historic structures (e.g., outbuildings, fencing, etc.), the redevelopment of existing structures to create a visitor facility offering indoor program and orientation space, and the development of a consolidated maintenance facility.

Alternative 2 and 3 call for the development of a solar shade structure over some or all of the Patchogue Ferry Terminal parking area. This particular development may be undertaken in partnership with local utilities, significantly reducing the cost to the government.

▸ CLIMATE CHANGE

Fire Island National Seashore exists entirely within the coastal plain of the state of New York. The Seashore's headquarters, primary maintenance facility, mainland ferry terminal, parking lots, visitor facilities, and most other infrastructure and resources are all vulnerable to future sea-level rise and storm surges. The action alternatives propose a number of facility-related actions to address a variety of visitor and infrastructure needs. The National Park Service will evaluate proposed facility investments prior to project approvals using the best scientific information available and the climate change strategies described above to ensure the long-term sustainability of these investments. Due to the Seashore's location and potential vulnerabilities, it is possible that the National Park Service may conclude that such financial investments for facilities would be unwise and that other options would be considered or that the proposed project would not be implemented at all.

▸ PHASING GMP IMPLEMENTATION

The successful implementation of Fire Island's approved GMP will rely on undertaking the many interrelated and additive actions proposed in the plan using a phased approach. The first phase would involve those actions that would support or otherwise form the basis for future actions. These include baseline research (e.g., marine resources inventory and evaluation, cultural resources inventory, and vulnerability assessments); key implementation plans (e.g., coastal land use and shoreline management plan); and legislative initiatives (e.g., seeking creation of a cooperative stewardship forum).

The next phases of the implementation would tier off the first phase efforts. For instance, following the completion of key marine research, work may begin on a marine resource management plan. A number of planning and development initiatives would rely on the completion of the Coastal Land Use and Shoreline Management Plan for guidance. These efforts include, but would not be limited to the Post Storm Recovery Plan, Dredge Management Plan, Wastewater Management Plan, and master planning for NPS facilities. Finally, the design and installation of new interpretive exhibits would occur as each site-specific master plan is completed.

Many proposed actions described in the plan could be completed independent of other plans and actions and may be undertaken at any time when the availability of funds and other relevant resources permit. The preparation of many of the proposed natural and cultural resource studies and plans could be addressed this way.

Approval of the GMP does not guarantee that funding or staffing for proposed actions will be available. Implementation of the approved GMP will depend on the availability of funds. Full implementation may occur many years in the future. All NPS construction and staffing proposals are contingent on NPS funding limitations and must compete for funds through the NPS priority-setting process.

TABLE 2-1: COMPARISON OF COST ESTIMATES FOR THE ALTERNATIVES
ALL COSTS REPRESENTED IN 2012 DOLLARS.

Annual Total Park Operating Costs[1]	FIIS 1 / WFE A Alternative 1	FIIS 2 / WFE B Alternative 2	FIIS 3 / WFE B Alternative 3
Staff FTE2	57	63.1	59
Total Annual Operating Costs (assumes FTE is 87% of Total)	$4,900,000	$5,430,000	$5,130,000
One Time Costs	**FIIS 1 / WFE A Alternative 1**	**FIIS 2 / WFE B Alternative 2**	**FIIS 3 / WFE B Alternative 3**
NPS Facility Costs[3]			
Facility projects (Fire Island) Park Area Wide Initiatives	$ 1,800,000	$ 3,900,000	$ 3,100,000
Facility Projects William Floyd Estate	$ 400,000	$ 4,000,000	$ 4,000,000
Total Facility Costs	**$ 2,200,000**	**$ 7,900,000**	**$ 7,100,000**
NPS Non-Facility Costs[4]			
Non-Facility projects (Fire Island) Park Area Wide Initiatives	$ 250,000	$2,400,000	$ 2,500,000
Non-Facility projects William Floyd Estate	$ 330,000	$1,070,000	$ 1,070,000
Total Non-Facility Costs	**$ 580,000**	**$ 3,470,000**	**$ 3,550,000**
Partnership Projects[5]			
Solar Shade Structure / Patchogue Ferry Terminal	$ 0	$ 4,200,000	$ 4,200,000
Total Partnership Costs	**$ 0**	**$ 4,200,000**	**$ 4,200,000**
Grand Totals — One Time Costs	**$ 2,780,000**	**$ 15,570,000**	**$ 14,850,000**

1 Annual operating costs are the total annual costs for park operations associated with each alternative, including: maintenance, utilities, staff salaries and benefits, supplies, and other materials. Cost estimates assume that the alternative is fully implemented as described in the narrative. Existing costs based on 2012 ONPS budget.

2 The total FTE is the number of person-years required to maintain the assets of the parks at a good level, provide acceptable visitor services, protect resources, and generally support the parks' operations. The FTE number indicates the ONPS-funded staff only, not volunteer positions or positions funded by partners FTE salaries and benefits are included in the annual operating costs.

3 One-time facility costs include design, construction, rehabilitation, or adaptive re-use of visitor centers, roads, parking areas, administrative facilities, comfort stations, educational facilities, maintenance facilities, museum service facilities, and other visitor facilities. Alternative 1 also incorporates cost for the William Floyd Estate's Management Alternative A; Alternatives 2 and 3 also incorporate costs for the William Floyd Estate's Management Alternative B.

4 One-time non-facility costs include actions not related to facilities, such as plans and studies and other park activities that would require substantial funding above annual operating costs. Alternative 1 also incorporates cost for the William Floyd Estate's Management Alternative A; Alternatives 2 and 3 also incorporate costs for the William Floyd Estate's Management Alternative B.

5 Partnership projects represent one-time facility costs that would be undertaken in pursuit of opportunities and partnerships for green infrastructure. Such projects would not be undertaken unilaterally by the NPS and would only be pursued if the NPS share represented 25% or less of the total project cost.

NPS PREFERRED ALTERNATIVE

The NPS Preferred Alternative (43 CFR 46.420d) is the alternative which the NPS believes would best accomplish the purpose and need of the proposed action while fulfilling its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors.

Management Alternative 3, in combination with Management Alternative B as described for the William Floyd Estate, has been identified as the NPS Preferred Alternative because it best meets the Seashore's management goals and conveys the greatest number of significant beneficial results relative to its potential impacts in comparison with other alternatives. Management Alternative 3 would do the most to ensure the cooperative stewardship of Fire Island National Seashore's dynamic coastal environment and its cultural and natural systems while recognizing its larger ecological, social, economic, and cultural context. This combination would also meet the specific needs and management goals related to the William Floyd Estate.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

In accordance with the DO-12 Handbook, the NPS identifies the environmentally preferable alternative in its NEPA documents for public review and comment [Sect. 4.5 E(9)]. The environmentally preferable alternative is the alternative that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative (43 CFR 46.30).

After evaluating the potential impacts of the management alternatives on cultural and natural resources, the NPS has determined that Management Alternative 3 in combination with Management Alternative B as described for the William Floyd Estate is the Environmentally Preferable Alternative because it best protects, preserves, and enhances the Seashore's natural and cultural resources. Management Alternative 3 proposes that Fire Island National Seashore be considered holistically – including its natural, cultural, and recreational values – and that it be understood within its regional context, resulting in a more effective approach to achieving these results.

CONSISTENCY WITH SECTION 101 AND 102 OF NEPA

This section describes how each alternative meets or achieves the purposes of NEPA, as stated in sections 101(b) and 102(1) (40 CFR 1502.2(d)). It includes a discussion of 1) disclosing how each alternative, one of which is identified as the environmentally preferred, meets the criteria set forth in section 101(b) of NEPA; and 2) any inconsistencies between the alternatives analyzed in detail and other environmental laws and policies.

- 1. Fulfills the responsibilities of each generation as trustee of the environment for succeeding generations.
- 2. Assures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.
- 3. Attains the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- 4. Preserves important historic, cultural, and natural aspects of our national heritage and maintains, wherever possible, an environment that supports diversity and variety of individual choice.
- 5. Achieves a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- 6. Enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources.
- Criterion 1: Fulfills the responsibilities of each generation as trustee of the environment for succeeding generations.

All of the Management Alternatives fulfill Criterion 1 by preserving the Seashore's fundamental resources and values for succeeding generations. Alternative 1, the No-Action alternative, fulfills this criterion in the most limited way as it is largely reactive in its approach and generally protects and preserves the Seashore's natural resources in their current state. Under Alternative 2, greater emphasis is placed on the restoration of natural landscapes and

processes on some federal parcels, but cultural resource and recreational values are not wholly considered, which could prevent it from being fully successful in meeting this criterion. Under Alternative 3, the environmentally preferable alternative, the NPS recognizes Fire Island as a natural landscape with a significant cultural overlay that extends across the geographic breadth of the national seashore to include both federal and non-federal lands. Efforts to better understand the cultural context and history of human use within the dynamic coastal environment on Fire Island and the William Floyd Estate could foster greater stewardship of the natural environment as the Seashore considers future management actions and adapts to changing conditions. The reinstitution of a residential environmental education program, targeting multiple audiences, is another important facet of Alternative 3 that would serve to foster a sense of stewardship in succeeding generations.

Criterion 2: Assures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.

All of the management alternatives ensure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans. Under Alternatives 2 and 3, protection of Fire Island's character is enhanced by proposals to revisit existing land- use regulations to consider ways to make them more effective in protecting the natural environment and sensitive to the overall character of Fire Island and its distinctive communities. This combination of the natural and the built environment has defined the Fire Island experience for generations of Seashore visitors. However, under Alternative 3, greater emphasis is placed on understanding and appreciating Fire Island as a whole, while the visitor experience under Alternatives 1 and 2 is focused on the federal lands. The NPS would prepare Fire Island-wide cultural landscape report and would offer technical assistance to Fire Island communities to inventory, preserve, and interpret cultural resources that are relevant to the history of Fire Island and the national seashore. Fostering understanding of Fire Island's heritage would contribute positively to the protection of Fire Island's overall character and sense of place. Under Alternative 3, resource protection and the visitor experience are enhanced through this more holistic management approach.

Criterion 3: Attains the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

Alternative 3 attains the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequence. As described in Alternative 3, NPS continues to provide for a wide range of visitor experiences and retains most of its existing visitor infrastructure. Additional shade structures are proposed for the Patchogue Ferry Terminal and Sailors Haven to allow for additional outdoor programming while providing visitors with protection from the elements (particularly the sun's harmful rays and the heat). At the William Floyd Estate, the existing visitor facilities would be rehabilitated and expanded to allow for the creation of year-round indoor program space, providing for expanded activities and use while reducing the risk of exposure to tick-borne disease. In Alternatives 1 and 2, the visitor experience would continue to be largely confined to the Seashore facilities, with little opportunity or incentive to explore other parts of Fire Island. Likewise, visitors to and residents of Fire Island communities would rarely visit the Seashore facilities.

Criterion 4: Preserves important historic, cultural, and natural aspects of our national heritage and maintains, wherever possible, an environment that supports diversity and variety of individual choice.

All of the proposed alternatives achieve this criterion to some degree. With its emphasis on a holistic approach to Fire Island that considers the visitor experience across the entire island and encourages greater exploration of related resources regionally, Alternative 3 carries this concept the furthest. Under Alternative 3, the NPS would place a higher priority on partnerships with Fire Island communities and others to illuminate the natural and cultural history of the island and to create new visitor opportunities to explore Fire Island in its entirety. The NPS would also work collaboratively with the ferry companies to extend water-based transportation into the shoulder seasons, improve water taxi service, and explore ways to make ferry service more affordable to low-income families and school districts. Under Alternative 3, the Seashore would continue to support a wide range of visitor facilities and recreational activities that range from the developed recreational facilities and protected beaches at Sailors Haven, Talisman, and Watch Hill to the wholly undeveloped expanse of the Fire Island Wilderness to a tour of the Old Mastic House at the William Floyd Estate.

Criterion 5: Achieves a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
Since the Seashore's establishment, the Secretary's zoning standards have been the only practical and legal tool available to the NPS to balance private residential and commercial development with the protection of the natural environment on Fire Island. For many reasons articulated throughout this document, this has not always met with success in terms of environmental protection or the preservation of community character. Alternatives 2 and 3 include proposals for a cooperative stewardship approach to managing the shared resources of Fire Island National Seashore and the collaborative development of a Coastal Land Use and Shoreline Management Plan. These proposed actions would provide the necessary framework for revisiting the land use and development regulations presently in place on Fire Island. Also noted above, both Alternatives 2 and 3 include proposals to revisit existing land use regulations to consider ways to make them more effective in protecting the natural environment and sensitive to the overall character of Fire Island and its distinctive communities. Under Alternative 3, the Seashore would work with ferry operators to consider expanding service during the shoulder seasons and subsidizing or waiving fares for school groups and low-income families. It would also provide for the creation of a residential environmental education program that would take advantage of underutilized, existing facilities during the shoulder seasons. These proposed actions would enable the Seashore to reach out to and serve broader audiences while fostering an understanding and appreciation of Fire Island's fragile resources. It would promote high standards of living and a wide sharing of life's amenities.

Criterion 6: Enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources.
This criterion is largely addressed by proposals found to some degree under all of the management alternatives. Under all alternatives, efforts to systematically update park infrastructure to address energy efficiency, water conservation, wastewater management, and the use of sustainable materials would maintain or improve the quality of renewable resources and reduce the use of depletable resources. This is also true of other proposed efforts to make the Seashore's fleets of vehicles and vessels more environmentally friendly as well as increasing the park's reliance on alternative energy to power its facilities.

IDEAS CONSIDERED BUT NOT ADVANCED FOR FURTHER ANALYSIS

Alternative 4 – Explore New Opportunities for Public Use
The planning team considered but rejected a fourth GMP alternative that would expand opportunities for public use on the island and encourage greater connections between the Seashore and related sites on Long Island. The proposal called for the expansion of existing facilities and the development of new ones on Fire Island and sought to increase visitation. Concerns about the additional development of the Seashore, the potential for a significant increase in visitation, and potential impacts on Fire Island communities have resulted in the dismissal of this proposal.

Removal of the Carrington House and Cottage
The planning team considered but rejected a proposal to remove the Carrington House and Cottage and allow the property to revert to a natural state. In the intervening time since the proposal was first made the Carrington House and Cottage was listed on the National Register of Historic Places. Also, work to rehabilitate the cottage had been undertaken by the Seashore in collaboration with a community-based partner with the intent of adaptively reusing the property. Under these new circumstances, the planning team found the proposal impractical and dismissed it.

Redevelopment of Watch Hill
The planning team considered but rejected a proposal to redevelop Watch Hill that called for reducing the size of the Watch Hill Marina by half, removing a number of existing structures and constructing a small, multipurpose facility in their place. Concerns were raised about a significant reduction in the number of boat slips, the recent expenditure of post-Sandy funds to improve and protect existing facilities, and the costs associated with the proposed projects. As a result, this proposal was dismissed.

Filling Mosquito Ditches in the Wilderness Area
The planning team considered but rejected a proposal to fill mosquito ditches in the Wilderness Area. It was determined that the costs associated with completing this work in the context of the Wilderness Area and

the constraints it places on the use of machinery would outweigh its ecological benefit. For this reason, the proposal was dismissed.

Restore Pre-existing Spur Trails in the Fire Island Wilderness

The planning team considered but rejected a proposal to restore pre-existing spur trails from the minimally maintained Burma Road trace into some areas of the Fire Island Wilderness. The planning team determined that the small scale of the Fire Island Wilderness area and the relative ease of navigation within it did not support the need for additional trails. Further, the reintroduction of spur trails would alter the wilderness character and experience by infringing upon opportunities for unconfined recreation.

Recreational Cross-Island Bike Trail

The planning team considered but rejected a proposal to create a cross-island recreational bike trail. The proposal met with considerable resistance from community representatives who raised concerns about the introduction of a formal, surfaced road or pathway across Fire Island. Currently there are no such roads on the island. The creation of a cross-island bike trail would require considerable cooperation among the various private and public property owners. In the absence of the necessary widespread support for the idea, the proposal was dismissed from further consideration.

Redrawing the Park Boundary to Exclude the Communities and/or Smith Point County Park

The planning team considered but rejected a proposal to redraw the park boundary to exclude the developed communities and/or the Smith Point County Park. These proposals were considered because the lack of NPS ownership and clear authority as well as conflicting institutional objectives often contributes to inefficient and costly management conflicts. The initial concept was that removing these lands from the park boundary would address this issue. In the final analysis, this proposal was rejected because these lands contributed to the overall character of Fire Island and possessed important resource values that transcended existing property boundaries. These resource values would be best managed through the pursuit of a collaborative management strategy.

South Shore Coastal Resources Institute

The planning team considered but rejected a proposal to create an institute to foster academic research, programming, and data sharing related to coastal resources of the South Shore Estuary in partnership with the Long Island South Shore Estuary Reserve, state and local agencies, and other institutions. The proposed Coastal Resource Institute appeared to very closely parallel the current role of SUNY/Stony Brook, raising concerns about unnecessary redundancies in the region.

Floating Classroom

The planning team considered but rejected the idea of inviting an educational vessel to dock for an entire season to offer programming due to concerns about shading out aquatic species. Instead the planning team considered inviting such vessels to participate in shorter- term visits to support programming in a one-to-two-day special event format.

Create Formal Off-shore Mooring Systems to Augment Existing Marina Space

The planning team considered creating formal off-shore mooring systems to augment existing marina space in lieu of permitting boaters to simply anchor off shore. Because of concerns related to the costs of managing such a system, the park determined that it would only consider this action if there were a resource- protection reason to do so.

Relocating Curatorial Storage

The planning team considered but rejected a proposal to relocate the Seashore's curatorial storage from its current location at the William Floyd Estate to a higher-elevation, off-site location. This was considered an unnecessary and costly proposal. The museum collection would continue to be adequately protected in its present location which is outside the 100- year floodplain.

Increase Recreational Emphasis at the William Floyd Estate

The planning team considered the possibility of an alternative that emphasized recreational use of the property and proposed rehabilitating and expanding the existing circulation system to accommodate increased recreational uses such as hiking, biking, and horseback riding. The proposal also called for the increased use of the grounds for activities like antique auto shows, art shows, and concerts. Under this alternative, public access to and programming for the historic house and grounds would have continued to emphasize the Estate's historic values. This alternative was dismissed from further consideration due to concerns about preserving and protecting the Estate's fundamental resources and about duplicating activities and opportunities already offered at other state, county, and local parks in the area.

Construct an Outhouse in the Lower Acreage at the William Floyd Estate

The planning team proposed the construction of an outhouse in the Lower Acreage at the William Floyd Estate to accommodate visitors to that area of the property. The proposal was dismissed from further consideration due to concerns that there was actually minimal need for such a facility and that it would have a negative impact on the cultural landscape.

Reconstruct the Sheep Barn at the William Floyd Estate

The planning team considered but rejected a proposal to reconstruct the Sheep Barn. Current NPS policy does not support the reconstruction of missing structures unless there is no alternative that would accomplish the park's interpretive mission. Proposals to interpret missing historic features using appropriate interpretive media have been incorporated into the proposed action alternative.

Allow for Non-Motorized Watercraft Access to the William Floyd Estate

The planning team proposed the designation of a landing for non-motorized watercraft at an appropriate location along Home Creek on the eastern side of the Estate. This proposal was dismissed from further consideration due to concerns about challenges associated with monitoring and controlling this access point and protecting and preserving the fundamental resources and values associated with the William Floyd Estate.

Relocate Main Gate of the William Floyd Estate to Washington Avenue

The planning team considered the possibility of relocating the main gate of the William Floyd Estate to Washington Avenue. The Washington Avenue gate is the currently the property's exit, served by a one-lane, one-way interior access road. Using the Washington Avenue gate for both entering and exiting visitor traffic would require that some existing interior roads be widened to accommodate two-way traffic. An analysis of existing routes from the William Floyd Parkway through the village of Mastic Beach to the William Floyd Estate did not reveal any significant advantages of using this gate as a point of entry over the existing entrance gate on Park Drive. For these reasons, the proposal was dismissed from further consideration.

Designate the William Floyd Estate as a Separate Unit of the National Park System

The planning team considered the possibility of seeking designation of the William Floyd Estate as a separate unit of the National Park System. The purpose of the proposed action would be to elevate the profile of the site as a separate and distinct unit and to secure dedicated, regular annual operating funds through the operating budget of the National Park Service. This would require an act of Congress and should a new unit be established, it would likely be administered by Fire Island National Seashore. This proposal was dismissed from further consideration because, on balance, it did not appear that it would offer significantly more benefits than simply improving on current management strategies for the property in its current status as a unit within Fire Island National Seashore.

TABLE 2-2: SUMMARY OF IMPACTS BY MANAGEMENT ALTERNATIVE

	Management Alternative 1/ Management Alternative A – Continuation of Current Management Practices (No Action)	Management Alternative 2 / Management B – Enhancing Natural Resource Values	Management Alternative 3/ Management B – Recognizing the Relationship between Human Use and Nature
Natural Resources			
Coastal Processes/ Floodplain	Both beneficial and adverse impacts to coastal processes and floodplains. The cumulative impact would be long-term and adverse, and Alternative 1 would contribute a beneficial increment to the overall adverse cumulative impact. Impacts would not be significant.	Overall long-term, beneficial impacts to coastal processes and floodplains. The cumulative impact would be beneficial over the long-term , and Alternative 2 would contribute an appreciable beneficial increment to the overall beneficial cumulative impact. Beneficial impacts would be significant. Adverse impacts would not be significant.	Overall long-term, beneficial impacts to coastal processes and floodplains. The cumulative impact would be beneficial over the long-term, and Alternative 3 would contribute an appreciable beneficial increment to the overall adverse cumulative impact. Beneficial impacts would be significant. Adverse impacts would not be significant.
Water Resources	Both beneficial and adverse impacts to water resources. The cumulative impact would be adverse, and Alternative 1 would contribute an adverse increment to the overall adverse cumulative impact. Impacts would not be significant.	Overall long-term beneficial impacts to water resources. The cumulative impact would be long-term beneficial, and Alternative 2 would contribute an appreciable beneficial increment to the overall beneficial cumulative impact. Impacts would not be significant.	Both beneficial and adverse impacts to water resources. The cumulative impact would be long-term minor adverse, and Alternative 3 would contribute a noticeable adverse increment to the overall adverse cumulative impact. Impacts would not be significant.
Vegetation	Overall long-term beneficial impacts to vegetation No cumulative impacts. Beneficial impacts would be significant as overall health of unique vegetation communities would be noticeably improved. Adverse impacts would not be significant.	Overall long-term beneficial and adverse short-term impacts to vegetation. No cumulative impacts. The overall beneficial impact of Alternative 2 would be considered significant, as the overall health of the unique vegetation resources within the Seashore would be improved to an even greater extent than under Alternative 1. Adverse impacts would not be significant.	Overall long-term beneficial and short-term adverse impacts to vegetation No cumulative impacts. The overall beneficial impact of Alternative 3 would be considered significant, as the overall health of the unique vegetation resources within the Seashore would be improved to an even greater extent than under Alternative 1. Adverse impacts would not be significant.

TABLE 2-2: SUMMARY OF IMPACTS BY MANAGEMENT ALTERNATIVE

	Management Alternative 1/ Management Alternative A – Continuation of Current Management Practices (No Action)	Management Alternative 2 / Management B – Enhancing Natural Resource Values	Management Alternative 3/ Management B – Recognizing the Relationship between Human Use and Nature
Wildlife and Wildlife Habitat	Both beneficial and short-term adverse impacts to wildlife and wildlife habitat. The cumulative impact would be long-term beneficial, and Alternative 1 would contribute a noticeable beneficial increment to the overall beneficial impact. Impacts would not be significant.	Overall long-term beneficial impact on wildlife and wildlife habitat. The cumulative impact would be long-term beneficial, and Alternative 2 would contribute a noticeable beneficial increment to the overall beneficial impact. Impacts would not be significant.	Both beneficial and adverse impacts to wildlife and wildlife habitat. The cumulative impact would be long-term beneficial, and Alternative 3 would contribute a noticeable beneficial increment to the overall beneficial impact. Impacts would not be significant.
Special Status Species	Both beneficial and adverse impacts to special status species. The cumulative impact would be long-term beneficial, and Alternative 1 would contribute a noticeable beneficial increment but also contribute an adverse increment to the overall beneficial impact. Impacts would not be significant.	Both beneficial and adverse impacts to special status species. The cumulative impact would be long-term beneficial, and Alternative 2 would contribute a noticeable beneficial increment to the overall beneficial impact. Impacts would not be significant.	Both beneficial and adverse impacts to special status species. The cumulative impact would be long-term beneficial, and Alternative 3 would contribute a noticeable beneficial increment to the overall beneficial impact. Impacts would not be significant.
Cultural Resources			
Cultural Landscape	Long-term beneficial impacts to cultural landscapes. No cumulative impacts. Beneficial impacts would be significant. Rehabilitation of the William Floyd Estate and Fire Island Light Station landscapes would be readily apparent.	Long-term beneficial and adverse impacts to cultural landscapes. No cumulative impacts. Beneficial impacts would be significant. Rehabilitation of the William Floyd Estate and Fire Island Light Station landscapes would be readily apparent Adverse impacts would not be considered significant.	Overall long-term beneficial and localized adverse impacts to cultural landscapes. No cumulative impacts. Beneficial impacts would be significant. Rehabilitation of the William Floyd Estate and Fire Island Light Station landscapes, would be readily apparent and completion of a Fire Island-wide cultural landscape report would enhance opportunities for protecting Fire Island's overall character. Adverse impacts would not be considered significant.

TABLE 2-2: SUMMARY OF IMPACTS BY MANAGEMENT ALTERNATIVE

	Management Alternative 1/ Management Alternative A – Continuation of Current Management Practices (No Action)	Management Alternative 2 / Management B – Enhancing Natural Resource Values	Management Alternative 3/ Management B – Recognizing the Relationship between Human Use and Nature
Historic Structures	Overall long-term beneficial and localized adverse impacts to historic structures. No cumulative impacts. Impacts would not be significant.	Overall long-term beneficial and localized adverse impacts to historic structures. No cumulative impacts. Beneficial impacts would be significant. Proposed rehabilitation efforts, and the relocation of non-historic functions from historic buildings would be detectable, and historic structures would be noticeably affected by these actions.	Overall long-term beneficial and localized adverse impacts to historic structures. No cumulative impacts. Beneficial impacts would be significant. Proposed rehabilitation efforts, relocation of non-historic functions from historic buildings would be detectable, and historic structures would be noticeably affected by these actions.
Archeology	Overall long-term beneficial and localized adverse impacts archeological resources. No cumulative impacts. Impacts would not be significant.	Both beneficial and adverse impacts to archeological resources. No cumulative impacts. Beneficial impacts would be significant; adverse impacts would not be. Efforts to inventory and document archeological resources and plan for their long-term protection and management would beneficially affect archeological resources.	Both beneficial and adverse impacts to archeological resources. No cumulative impacts. Beneficial impacts would be significant; adverse impacts would not be. Efforts to inventory and document archeological resources and plan for their long-term protection and management would beneficially affect archeological resources.
Museum Collections	Overall long-term beneficial and adverse impacts to museum collections. No cumulative impacts. Impacts would not be significant.	Overall long-term beneficial and adverse impacts to museum collections. No cumulative impacts. Beneficial impacts would be significant. Reorganizing and refurnishing the curatorial storage facility would result in substantive changes and their beneficial impact on museum collections would be slightly to readily detectable. Adverse impacts would not be significant.	Overall long-term beneficial impacts to museum collections. No cumulative impacts. Beneficial impacts would be significant. Expanding the curatorial storage facility would result in substantive changes and their beneficial impact on museum collections would be readily detectable.

TABLE 2-2: SUMMARY OF IMPACTS BY MANAGEMENT ALTERNATIVE

	Management Alternative 1/ Management Alternative A – Continuation of Current Management Practices (No Action)	Management Alternative 2 / Management B – Enhancing Natural Resource Values	Management Alternative 3/ Management B – Recognizing the Relationship between Human Use and Nature
Wilderness			
Fire Island Wilderness	Overall long-term beneficial impacts to Fire Island Wilderness. No cumulative impacts. Impacts would not be significant.	Overall long-term beneficial impacts to Fire Island Wilderness. No cumulative impacts. Impacts would be significant. Development on the edges of the Fire Island Wilderness would be minimized and the emphasis on ecological restoration would help NPS to more fully meet the goals and directives regarding management of Wilderness.	Overall long-term beneficial impacts to Fire Island Wilderness. No cumulative impacts. Impacts would not be significant.
Transportation and Access			
Transportation and Access	Overall long-term beneficial impacts to transportation and access. Alternative 1 would contribute an imperceptible beneficial increment to the overall beneficial impact. Impacts would not be significant.	Overall long-term beneficial and adverse impacts to transportation and access. Alternative 2 would contribute an imperceptible adverse increment to the overall beneficial impact. Beneficial impacts would be significant. Improvements to parking and circulation system at the Floyd Estate, wayfinding, and public transportation, and preserving the roadless character of Fire Island would be notable. Adverse impacts would not be significant.	Overall long-term beneficial and adverse impacts to transportation and access. Alternative 3 would contribute an imperceptible beneficial increment to the overall beneficial impact. Beneficial impacts would be significant. Improvements to parking and circulation system at the Floyd Estate, wayfinding, and public transportation, and preserving the roadless character of Fire Island would be notable. Adverse impacts would not be significant.

TABLE 2-2: SUMMARY OF IMPACTS BY MANAGEMENT ALTERNATIVE

	Management Alternative 1/ Management Alternative A – Continuation of Current Management Practices (No Action)	Management Alternative 2 / Management B – Enhancing Natural Resource Values	Management Alternative 3/ Management B – Recognizing the Relationship between Human Use and Nature
Visitor Use and Experience			
Visitor Use and Experience	Overall long-term beneficial and adverse impacts to visitor use and experience. Alternative 1 would contribute an imperceptible long term minor adverse increment to the overall beneficial impact. Impacts would not be significant.	Overall long-term beneficial and adverse impacts to visitor use and experience. Alternative 2 would contribute imperceptible long term minor adverse and beneficial increments to the overall beneficial impact. Both beneficial and adverse impacts would be significant. Removal of visitor facilities, changes in visitor programming and access, and the emphasis on interaction with the natural environment would substantially change the way visitors experience many of the Seashore's sites and facilities on Fire Island. This change could be viewed positively by some and negatively by others. Improvements to the cultural landscape, historic structures, visitor facilities, and visitor programming at the William Floyd Estate would be beneficial.	Overall long-term beneficial and adverse impacts to visitor use and experience. Management Alternative 3 would contribute short term minor adverse and beneficial increments to the overall beneficial impact. Beneficial impacts would be significant. Many of the proposed actions described under this alternative would result in readily detectable and substantive impacts including broadening the visitor experience to address both natural and cultural heritage of Fire Island and its regional context; and improvements to the cultural landscape, historic structures, visitor facilities, and visitor programming at the William Floyd Estate. Adverse impacts would not be considered significant.

TABLE 2-2: SUMMARY OF IMPACTS BY MANAGEMENT ALTERNATIVE

	Management Alternative 1/ Management Alternative A – Continuation of Current Management Practices (No Action)	Management Alternative 2 / Management B – Enhancing Natural Resource Values	Management Alternative 3/ Management B – Recognizing the Relationship between Human Use and Nature
Socioeconomic Environment			
Socioeconomic Environment	Overall long-term beneficial and adverse impacts to the socioeconomic environment. Alternative 1 would contribute imperceptible long term minor adverse and beneficial increments to the overall beneficial impact. Beneficial impacts would not be significant. Adverse impacts would be considered significant over time resulting in the failure to adequately address land-use and development practices.	Overall long-term beneficial and adverse impacts to the socioeconomic environment. Alternative 2 would contribute minor adverse increments to the overall beneficial impact. Beneficial impacts would be significant. Many proposed actions would result in readily detectable and substantive impacts that would improve stewardship of Seashore resources. Adverse impacts would not be considered significant.	Overall long-term beneficial and adverse impacts to the socioeconomic environment. Alternative 3 would contribute a beneficial increment to the overall beneficial impact. Beneficial impacts would be significant. Many proposed actions would result in readily detectable and substantive impacts that would improve stewardship of Seashore resources. Adverse impacts would not be considered significant.
Seashore Operations			
Seashore Operations	Overall long-term adverse impacts to Seashore operations. No cumulative impacts. Beneficial impacts would not be significant. Adverse impacts would be significant because of the degree to which they are likely to exceed existing park budget and staffing constraints.	Overall long-term beneficial and adverse impacts to Seashore operations. No cumulative impacts. Beneficial impacts would be significant and would result in expanded use of partners to achieve objectives and facilities that become more ecologically sensitive and sustainable. Removal of selected facilities would reduce maintenance and operational requirements. Adverse impacts would be significant because they are likely to result in exceeding park budgets and staffing constraints.	Overall long-term beneficial and adverse impacts to Seashore operations. No cumulative impacts. Beneficial impacts would be significant and would result in expanded use of partners to achieve objectives and facilities that become more ecologically sensitive and sustainable. Adverse impacts would be significant because they are likely to result in exceeding park budgets and staffing constraints.

TABLE 2-3: SUMMARY OF PLANNING NEEDS (PREFERRED ALTERNATIVE)

Proposed Plans	Description	Priority (H,M,L)
Coastal Land Use and Shoreline Management Plan	This plan would address shoreline protection, land- use controls, site planning, and design standards, and post- storm response in the context of the dynamic barrier environment and emerging trends resulting from sea- level rise and climate change. The plan must be undertaken and adopted as a multi-lateral, collaborative effort. The plan would be consistent with the Tentative Federally Supported Plan (TFSP) for FIMP and would articulate a comprehensive strategy for protecting coastal resources while addressing resilience in land – use development within the coastal zone on both federal and non-federal lands within the Seashore. Further, the plan would be consistent with the recommendations of the 2013 interagency Hurricane Sandy Task Force.	H
Commercial Services Plan	The NPS would prepare a commercial services plan to determine which types and levels of activities, services, and facilities would be provided at the Seashore and how they would be managed by the NPS in the most effective and efficient manner. The commercial services plan would identify the best management approach for ferry transportation and the operation of marinas, food services, and other visitor service activities. The Commercial Services Plan would also address strategies for introducing sustainable design, energy efficiency, pricing and affordability, and other conditions of use into the administration of commercial services at the Seashore.	H
Marine Resource Management Plan	This plan would define NPS roles and priorities and would recommend collaborative management strategies to promote the long-term protection and sustainability of marine resources within the larger contexts of Great South Bay and the Atlantic Ocean. The Marine Resources Management Plan would address issues pertinent to fishing and shellfishing, the protection of submerged aquatic vegetation, the protection of submerged archeological resources, and the management of operational and recreational activities (e.g. motor boat access) with in the marine management area of the Seashore.	H
Dredge Management Plan	The NPS would work with federal, state, and local government, and other entities to develop a programmatic dredge management plan to allow for the placement of dredge materials for beneficial purposes (e.g., augment eroding shorelines and protect habitats) along the bay and ocean shorelines of Fire Island as appropriate. Use and placement of dredge materials would emulate bayside natural systems of sand movement as feasible. This plan would be consistent with the Coastal Land Use and Shoreline Management plan and would also address maintenance dredging needs for navigation channels and marinas on Fire Island, assess any contaminant issues, determine a planned frequency of dredging, and evaluate environmental and cost-effective alternatives to dredging at some locations (e.g., shallow draft vessels).	M

TABLE 2-3: SUMMARY OF PLANNING NEEDS (PREFERRED ALTERNATIVE)		
Post-Storm Recovery Plan	This plan would provide guidelines on how to respond to a range of storm events, including various degrees of structural damage and shoreline change. The NPS would encourage Fire Island communities, Smith Point County Park, and Robert Moses State Park to include post-storm planning guidelines in their local comprehensive or master plans that are consistent with the post-storm recovery plan developed for Fire Island. The plans should be consistent with the Fire Island Coastal Land Use and Shoreline Management Plan, the Tentative Federally Support Plan for FIMP, and the recommendations of the Hurricane Sandy Task Force.	M
Wastewater Management Plan	The plan would evaluate the issues and impacts associated with the present state of wastewater management on Fire Island on both federal and non-federal lands and outline a range of possible alternatives and develop a cooperative implementation strategy. The plan would be undertaken in collaboration with USGS, Suffolk County, the towns of Brookhaven and Islip, and the Fire Island communities.	M
New Master Plans for Federal Facilities at Fire Island Light Station, Sailors Haven, Talisman, Watch Hill, and Wilderness Visitor Center	The NPS would develop updated master plans for the federal facilities on Fire Island that address site circulation, rehabilitation or replacement of existing facilities (e.g., maintenance, staff housing, visitor facilities), visitor amenities (e.g., group educational shelters, moorings), interpretive media, infrastructure, reducing environmental impacts (e.g. water quality, shoreline erosion, etc.) and improving operational efficiencies. Each master plan would include an analysis of the potential impacts of climate change and sea-level rise, employ relevant departmental and agency standards and guidelines, and incorporate the recommendations of the Hurricane Sandy Task Force.	M
Threatened & Endangered (T&E) Species Management Plan	This plan would update the Seashore's T&E Species Management Plan and include provisions to consider and address the potential effects of climate change and sea-level rise on T&E species.	M
Comprehensive Invasive Species Management Plan	This plan would address prevention, surveillance, and management priorities for non-native invasive species management. The plan would identify educational and other strategies for achieving management objectives across Fire Island and at the William Floyd Estate.	M
Cultural Landscape Report and Treatment Plan for William Floyd Estate	The NPS would prepare a Cultural Landscape Report (CLR) and Treatment Plan for the Estate.	M
Historic Furnishings Implementation Plan for Old Mastic	In response to the Old Mastic Historic Furnishings Report recommendations, the NPS would prepare a Historic Furnishings Implementation Plan that would include an operating plan, recommended list of furnishings, and schematic floor plans.	L
Fire Management Plan for William Floyd Estate	The NPS would complete plans that would address the risk of wildland fire (i.e., any nonstructural fire, other than prescribed fire, that occurs in the wildland) on the Estate and consider the use of prescribed fire in the management of the cultural landscape. The affect of climate change on wildland fire risk would be considered in the fire management plan.	L
Archeological Resource Management Plan for William Floyd Estate	The NPS would undertake a comprehensive archeological resource management plan for the Estate that would consider previously conducted archeological investigations on the property.	L

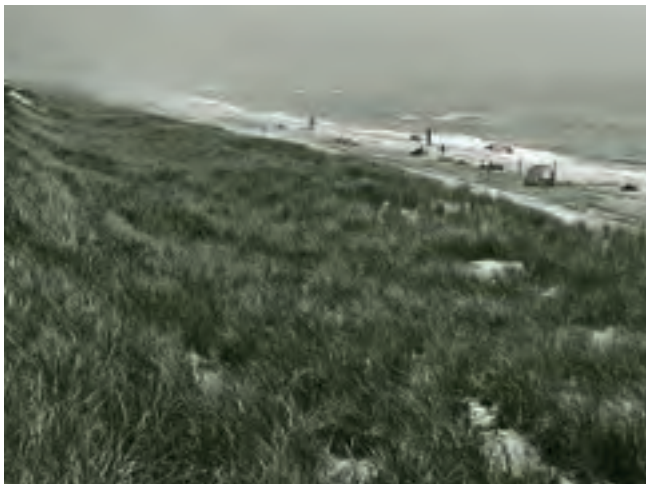
3: Affected Environment

INTRODUCTION This chapter describes the existing natural, cultural, socioeconomic, and physical conditions at Fire Island National Seashore (the Seashore) and its environs. It provides basic information about existing conditions to be used as context for comparing the potential impacts of the alternatives proposed in the Fire Island National Seashore General Management Plan/Environmental Impact Statement (GMP/EIS). Relevant resource topics were selected based on agency and public concerns, regulatory and planning requirements, and known resource issues. Resources relevant to the park and the GMP/EIS are discussed below. Impacts associated with each of these topics are analyzed in "Chapter 4: Environmental Consequences" of the draft GMP/EIS.

The natural resources at Fire Island National Seashore are unique to its barrier island environment. Many of these resources are in a constant state of flux, due to the dynamic nature of the barrier island. Other resources are influenced by regional conditions. The desire to protect these resources from future development was one of the primary factors in the establishment of Fire Island National Seashore. The Seashore also was established to provide the public with access to these resources.

Fire Island has a rich cultural heritage with some communities and institutions (e.g., U.S. Life Saving Service) having their roots on the island in the mid-19th century. Prior to its inception as a resort area in the 1880s, Fire Island had been put to agricultural and industrial use for generations. Fire Island represents a cultural landscape that has been shaped both by human intervention and the forces of nature.

Below is a descriptive summary of the existing environmental conditions.



CLIMATE CHANGE

Climate change refers to changes in the earth's atmospheric, hydrologic, and oceanic system that can alter the landscape, natural resources, cultural sites, facilities, and the visitor experience of the Seashore. These changes, including warmer global air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level, provide evidence that the earth's climate system is warming.

In 2011, the New York State Energy Research and Development Authority (NYSERDA) released a report prepared by Columbia University, the City University of New York, and Cornell University entitled *Responding to Climate Change in New York State: the ClimAID Integrated Assessment of Effective Climate Change in New York State,*[9] www.nyserda.ny.gov/climaid. The in-depth technical report provides a state-level assessment describing historical trends, contemporary observations of conditions, as well as future projections related to climate change as they pertain to a wide range of areas including but not limited to the coastal zone, water resources, ecosystems, agriculture, transportation, and public health. The report also made recommendations for adapting to the changing conditions resulting from climate change, summarizing trends and projecting conditions in a number of areas including the coastal zone and

9 **Rosensweig, C., W. Solecki, A. DeGaetano, M. O'Grady, S. Hassol, P. Grabhorn (eds). 2011.** Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation. Synthesis Report. New York State Energy Research and Development Authority (NYSERDA). Albany, NY.

ecosystems that are particularly relevant to the Seashore. Their assessment of key climate impacts for coastal zones and ecosystems appear as follows:

Coastal Zones – Key Climate Impacts

High water levels, strong winds, and heavy precipitation resulting from severe coastal storms already cause billions of dollars in damages and disrupt transportation and power distribution systems. Sea-level rise will lead to more frequent and extensive coastal flooding. Warming ocean waters raise sea level through thermal expansion and have the potential to strengthen the most powerful storms.

- Barrier islands are being dramatically altered by strong coastal storms as ocean waters overwash dunes, create new inlets, and erode beaches.
- Sea-level rise will greatly amplify risks to coastal populations and will lead to permanent inundation of low-lying areas, more frequent flooding by storm surges, and increased beach erosion.
- Loss of coastal wetlands reduces species diversity, including fish and shellfish populations.
- Some marine species, such as lobsters, are moving north out of New York State, while other species, such as the blue claw crab, are increasing in warmer waters.
- Saltwater could reach farther up the Hudson River and into estuaries, contaminating water supplies. Tides and storm surges may propagate farther, increasing flood risk both near and far from the coast.
- Sea-level rise may become the dominant stressor acting on vulnerable salt marshes.

Ecosystems – Key Climate Impacts

- Within the next several decades, New York State is likely to see widespread shifts in species composition in the state's forests and other natural landscapes, with the loss of spruce-fir forests, alpine tundra, and boreal plant communities.
- Climate change will favor the expansion of some invasive species into New York, such as kudzu, an aggressive weed, and the hemlock woolly adelgid, an insect pest. Some habitat and food generalists (such as white-tailed deer) may also benefit.
- A longer growing season and the potential fertilization effect of increasing carbon dioxide could increase the productivity of some hardwood tree species, provided growth is not limited by other factors such as drought or nutrient deficiency.
- Carbon dioxide fertilization tends to preferentially increase the growth rate of fast-growing species, which are often weeds and other invasives.

- Lakes, streams, inland wetlands, and associated aquatic species will be highly vulnerable to changes in the timing, supply, and intensity of rainfall and snowmelt, groundwater recharge, and duration of ice cover.
- Increasing water temperature will negatively affect brook trout and other native coldwater fish.

The authors prepared a summary report that provides a general synthesis of highlights from the larger technical report that resulted from this effort. The *Synthesis Report* has been included in its totality in Appendix B of this plan to provide a more complete picture of the state of climate change in New York State, including key impacts and suggested adaptation strategies. The complete *Technical Report* is available at www.nyserda.ny.gov/climaid.

NATURAL RESOURCES

Coastal Processes

At the peak of the Wisconsin glaciation more than 20,000 years before present, much of New York State was covered by the Laurentide ice sheet. As the climate warmed (21,000 to 8,000 years before present), the ice sheet melted and retreated, releasing rock, sand, and mud. The present- day Long Island landscape consists of glacial features such as moraines, kettle lakes, and outwash plains formed during this time. The melting ice sheet also released water, causing sea level to rise. A chain of narrow barrier islands along Long Island's south shore is made up of outwash sediment from the last glaciation shaped by waves and currents over time (NPS, 2005c).

Fire Island is a 32-mile-long barrier island bounded on the west by Fire Island Inlet and on the east by Moriches Inlet. The Great South Bay, Narrow Bay, and Moriches Bay separate Fire Island from mainland Long Island. These bays are relatively shallow, with an average depth of 6.5 feet (Wilson et al., 1991) and are characterized by brackish water with an average salinity of 25.9 parts per thousand (Tanski et al., 2001). The width of Fire Island ranges from approximately 600 feet to over 3,200 feet. From ocean to bay, the undulating landscape includes a variety of coastal features including beach face, beach berm, foredune or primary dune, secondary dune, ridge and swale habitat, maritime forest, and salt marsh.

Wind, waves, tides, and currents are constantly moving sediment to, from, and along the shoreline of Fire Island. The energy of crashing waves forms a current in the surf zone termed longshore transport or littoral drift that moves particles along the shore. Wind and waves also transport sediment across the shore, between the offshore bar, beach face, berm, dunes, bay shoreline, and bay. Sediment transport processes are influenced by many factors, including wind and wave energy, sediment supply, and human activity. Consequently, the Fire Island landscape varies across time.

A sediment budget describes the sources, sinks, and movement of sediment within a defined system. Imbalances in the system cause the shape and position of the shoreline to change. A sediment surplus allows for growth. For example, the Fire Island Inlet migrated approximately five miles westward between 1825 and 1941, when it was stabilized by the US Army Corps of Engineers (USACE) (Kassner and Black, 1983). When the amount of sediment lost is greater than the amount gained, shoreline erosion occurs.

The net movement of material from east to west along Fire Island within the longshore sediment transport system is well documented; however, the amount of sediment and the way it moves within the system is not as clear. Numerous estimates of the sediment budget for Fire Island show an imbalance in this system, with less material passing Moriches Inlet on the east end of the island than is accumulating at Democrat Point on the west end (Schwab et al., 2013). Physical barriers, such as jetties and groins, interrupt longshore flows and result in the deposition of material on the updrift side of the impediment. Naturally occurring and stabilized inlets also serve as sediment sinks, where sediment is deposited in flood- and ebb-tidal deltas. Beach nourishment is believed to offset some of the losses within the system, but it is unlikely that beach nourishment alone compensates for the deficit in the Fire Island sediment budget (Schwab et al., 2013).

The most recent science indicates that offshore sources make an important contribution to the sediment budget for Fire Island. Offshore ridges are believed to supply sand to the central and western segments of the island west of Watch Hill and may account for the sediment budget imbalance (Hapke et al., 2010 and Schwab et al., 2013). East of Watch Hill, this supply is not readily available, and shoreline retreat predominates (Schwab et al., 2013). To better understand the details of the Fire Island sediment budget, offshore sand supply is the subject of ongoing research.

Cross-shore sediment transport also influences the shape and position of the barrier island (Hapke et al., 2008). Hurricanes and nor'easters also play an important role in transporting sand across the island. Storm waves reach the upper beach and landward portions of the island, either overwashing or eroding sediment from these areas. Sand moved across the island raises the elevation of the island's interior and bay side. Sand moved offshore during these events will gradually return through wind and wave action to build up the beach and dunes. Storms can also cause breaches or openings in the barrier island that allow water and sediment to move between the ocean and the bay. Cross-island processes provide essential sources of sediment that allow barrier islands to keep pace with sea-level rise.

Cross-shore sediment transport includes eolian (wind-blown) transport of fine sand, essential to the natural development of dunes. Dune formation and evolution is largely related to the conditions of the shoreline. If the beach is stable, sand continues to accumulate, increasing the width and height of the dune. If the shoreline is eroding, the foredune is intermittently scarped and lowered, sand is transported over the crest, and the dune ridge shifts inland. If the shore is accreting, the foredune may widen or a new foredune will develop, resulting in primary and secondary dune ridges separated by an interdune or swale area.

Dunes provide some amount of protection from wind and storm waves to landward features; however, even large, well-developed dunes can be flattened or overtopped during severe storms. Dunes naturally redevelop after storms as sand accumulates at the foot of the dunes and pioneer species, such as American beachgrass (*Ammophila breviligulata*), take root and stabilize the sand; but this takes time. Human activity, such as development, erosion control strategies, and recreation can alter the natural transport of sand and extent of vegetation cover, thereby affecting the natural formation and evolution of dunes.

Like the ocean shoreline, the formation and evolution of the bay shoreline on Fire Island is governed by the wind, waves, and tides. Despite the Great South Bay's low wave energy and tidal range, there is a general trend of erosion on the bay shoreline (Nordstrom and Jackson, 2005). Inlets, overwash, and dune migration move sand across the island from ocean to bay. Dune building and stabilization on the island's southern shoreline therefore limit the delivery of sediment to the bay shoreline (Nordstrom and Jackson, 2005). The result is bay shoreline loss -- averaging approximately 1 foot per year (Nordstrom and Jackson, 2005), with losses as high as 10.8 feet recorded in a single year (Nordstrom et al., 2009).

How and where bay side sediment is moved is not as clear as the east-west transport of sediment on the ocean side. Longshore sediment transport does take place, albeit more slowly and in localized cells separated by shoreline features and bulkheading (Nordstrom and Jackson, 2005). Not only is the transport system sand-starved, but it is interrupted by shoreline hardening, with nearly 18% of the island's bay side bulkheaded (Nordstrom et al., 2009). Rather than absorbing wave energy like a natural "soft" shoreline, hard structures like bulkheads can reflect wave energy and increase erosion. Shoreline hardening also changes the amount of sand available to the system by keeping upland sediment from contributing to the sediment budget. Navigational channels have been created through the shallow flats of the bay to provide access to existing marinas and docks along the bay shoreline. Material dredged from the bay has historically been placed upland, thus removing sediment from the system.

▸ FLOODPLAINS

Executive Order 11988, "Floodplain Management," provides for the protection of floodplain values, while NPS Director's Order (DO) 77-2: Floodplain Management, provides the NPS with requirements for implementing the Executive Order. Floodplains are fluvial lands adjacent to freshwater streams and rivers that receive floodwaters once the water has overtopped the bank of the main channel. This is typically the result of a higher- than- normal influx of upstream water supplies (water moving from higher elevations to lower elevations). Floodplains are important resources in the storage and filtering of these floodwaters. Construction within a floodplain can result in direct long-term impacts such as decreased flood storage volumes, restriction of natural flow patterns, and exacerbation of catastrophic flooding in downstream areas.

A flood zone is an area defined for management purposes that is subject to the risk of flooding by any natural means, whether by water cresting the banks of channels (fluvial floodplain) or by tidal storm surges. Tidal storm surges occur when water is pushed up by high winds and low atmospheric pressure to higher-than-normal elevations during coastal storms and hurricanes.

On Long Island, the NPS headquarters office, Patchogue Ferry Terminal, and maintenance area are adjacent to the Patchogue River. While most of the Village of Patchogue is outside the 100- and 500-year flood zones, Long Island is classified as Zone X by the Federal Emergency Management Agency (FEMA). Zone X is defined as areas of 100- and 500-year flood zones with flood depths of less than one foot or with drainage areas less than 1 square mile. Lands that border the edge of the river, like the headquarters, the ferry terminal, and portions of the maintenance area, fall within the area classified as Zone AE. The Zone AE areas include the 100-year flood zone. FEMA has defined the 100-year flood zone based on a flood elevation of 6 feet National Geodetic Vertical Datum of 1929 (NGVD29) (FEMA 1998a). At the William Floyd Estate, most of the property is landward of the 100- and 500-year flood zones. The portions of the property along the marsh shoreline are classified as Zone X by FEMA (FEMA 1998b).

All Fire Island properties fall within flood zone designations as defined by FEMA as Zone AE or Zone VE. The 100-year flood zone elevation within Zone AE areas on Fire Island ranges from 7-9 feet NGVD29. Zone VE is also within the 100-year flood zone, but has an established elevation associated with additional hazard caused by wave run-up. The Zone VE elevation at Fire Island, as determined by FEMA, is 10-12 feet NGVD29. Areas on Fire Island excluded from these zones include sections of high dunes on the bay side that reach elevations exceeding 20 feet.

Within the past 70 years, at least nine major storms have struck the vicinity of Long Island, including the Hurricane of 1938 ("Long Island Express" with a 14-foot storm surge), Ash Wednesday Storm of 1962 (9-foot storm surge), the Halloween Storm of 1991 lasting 3 days (5-foot storm surge), the March 1993 storm, and most recently the October 2012 storm named Hurricane Sandy (though not a hurricane when it hit Long Island) with a storm surge in excess of 7 feet. Overwashes, channel incision, dune/scarp erosion, breaching, shoreline accretion, and damage to buildings and infrastructure are all documented outcomes from such storms.

Water Resources

▸ MARINE RESOURCES

The Fire Island National Seashore boundary, which extends 26 miles from the eastern boundary of Robert Moses State Park eastward to the midpoint of Moriches Inlet, encompasses both terrestrial and marine environments off the southern coast of Long Island. The park totals 19,353 acres, of which approximately 14,600 acres are submerged lands associated with Great South Bay and the Atlantic Ocean (NPS 2009b). The southern boundary of the park extends approximately 1,000 feet into the Atlantic Ocean, the equivalent of approximately 3,212 acres, and the boundary north of the barrier island extends into Great South Bay at varying distances ranging from approximately 2,000 to 4,000 feet. The majority of the offshore area is characterized as a sandy bottom environment typical of coastal zones. Due to the high energy and dynamic nature of the surf zone on the Atlantic Ocean side of the island, this area has low faunal diversity, transient benthic macrofauna, and a relatively low fish diversity (NPS 2009b).

Surface waters that provide habitat for freshwater fish are limited at Fire Island National Seashore. There are no known data on the presence or status of freshwater fish within ponds in the Seashore.

Seventy-two species of marine fish have been documented in or near park waters, within the Great South Bay and Atlantic Ocean. The Great South Bay habitat complex supports regionally significant populations of marine and estuarine fish and a commercial and recreational fishery of regional importance (USFWS 1997). There is little information on finfish species specific to the Seashore; therefore, much of what is currently known must be inferred from reports of recreational and commercial landings of harvested fish within Great South Bay or New York State (Trocki 2008).

Some species are present only transiently as older juveniles and adults such as hickory shad (*Alosa mediocris*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), smooth dogfish (*Mustelis canis*), menhaden (*Brevoortia tyrannus*), and striped mullet (*Mugil cephalus*) (Schaefer 1967). However, other species including striped bass (*Morone saxatilis*), weakfish (*Cynoscion regalis*), and American eel (*Anguilla rostrata*), rely on waters surrounding the Seashore for both nursery grounds and adult habitat. Other species that likely rely more heavily on habitat within the Seashore include summer flounder (*Paralichthys dentatus*), winter flounder (*Pseudoplearonectes americanus*), bluefish (*Pomatomus salatrix*), tautog (*Tautog onitis*), and black seabass (*Centropristis striata*) (Trocki 2008).

Another important component of the finfish community within the Seashore are the forage fish that provide food for piscivores (both larger fish and waterbirds) and are sometimes harvested for use as bait. These include Atlantic silversides (*Menidia menidia*), bay anchovy (*Anchoa mitchilli*), killifish species (*Family Cyprinodontidae*), and northern pipefish (*Syngnathus fuscus*) found in salt marshes and near shore habitats, where they are a major food source for crabs, wading birds, and larger predator fish such as the summer flounder (Trocki 2008).

Recent ocean-side surveys to test the efficacy of ocean sampling gear found that striped bass (*Morone saxatilis*) and hickory shad (*Alosa mediocris*) were most common in June, while sea robin (*Prionotus carolinus*), striped bass, and pipefish were the most common species in August. The American sand lance (*Amoodytes americanus*) is a major component of the winter fish assemblage on both sides of Fire Island and provides forage for many wintering piscivores (Conover 2005).

Also recorded within the boundaries of the Seashore are 19 species of marine mammals, including whales, porpoises and dolphins, and seals. The harbor seal (*Phoca vitulina*) is regularly observed during the winter at both Fire Island Inlet and Moriches Inlet. The fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), and northern right whale (*Eubalaena glacialis*) are also seen within the offshore waters of Fire Island.

The Seashore includes approximately 7,413 acres of submerged lands in the shallow bays north of Fire Island. These lands are mostly within Great South Bay, but a small segment is in Moriches Bay to the east. The bayside waters are shallow (3-10 feet) and typically have a sandy bottom. Salinity within the bays ranges from 25 to 30 parts per thousand. Large areas of the shallow bay bottom are colonized with submerged aquatic vegetation (SAV) such as eelgrass (*Zostera marina*), which is more concentrated along the southern shore of the bay. However, eelgrass densities have varied greatly over time. A 1981 aerial survey provided in Carpenter et al. (1991) indicated that approximately one third of the bay was colonized with SAV. More recent impacts from periods of brown tide and reduced water clarity and quality have likely had an impact on SAV distribution, but this has not been quantified (NPS 2005a). However, existing SAV beds within the bays provide valuable habitat for scallops, shrimp, crabs, and various juvenile fish.

Unvegetated areas of Great South Bay have historically been associated with hard clam (*Merceneria merceneria*) habitat. Clam densities are variable, ranging from a highs of 1.25 clams per square foot to lows averaging 0.2 clams per square foot. Clams are found in greater concentrations in sediments with a higher fraction of coarse-grained materials, especially shell fragments (Maher and Cerrato 2000). The Town of Brookhaven clam census data suggests the overall clam population is in decline, a decades-long trend. Other mollusks reported within Great South Bay include oysters (*Crassostrea virginicus*), softshell clams (*Mya arenaria*), and the blue mussel (*Mytilus edulis*). Shellfish are an important component of the overall aquatic ecosystem due to their ability as filter feeders to absorb and sequester nutrients, as well as remove suspended solids from the water column.

Crustaceans represent an important component of the aquatic ecosystem at Fire Island both as predators and prey. Crustaceans reported within Great South Bay and adjacent bays include the blue crab (*Callinedtes sapidus*), Jonah crab (*Cancer borealis*), rock crab (*Cancer irroratus*), lady crab (*Ovalipes ocellatus*), fiddler crab (*Uca pugnax*), green crab (*Carcinus maenas*), spider crab (*Libinia emarginata*), and mud crab (*Neopranope texana*) (NPS 2005d). Although never a primary target for commercial harvest in the Great South Bay, commercial landings for the blue crab peaked between 1993 and 1996. Since the 1990s, commercial harvest of the blue crab has been declining; however, the blue crab and rock crab populations within the bay are still high enough

to allow for recreational crabbing. A variety of finfish are identified in the National Marine Fisheries Service database as present within Great South Bay commercial landings. However, only a few species show up regularly in the record, including weakfish (*Cynoscion regalis*) and bluefish (*Pomatomus saltatrix*) (NPS 2005d). Recreational fishing within the bays is very prevalent and provides major economic benefits to the area.

▸ FRESHWATER RESOURCES

Fire Island National Seashore comprises multiple properties in different ecological settings. Several Seashore properties occur near the south shore on the mainland of Long Island (the William Floyd Estate, the Seashore headquarters, and maintenance area), while the majority of the Seashore is contained on the barrier island of Fire Island and adjacent oceanic and estuarine waters. Historic land uses, coastal dynamics, and recent legislative initiatives have played an integral role in the formation, presence and condition of these properties. Ground and surface water resources comprise a small portion of this ecosystem, and are most sensitive to the dynamic settings shaped by wave and wind action, storms, and human activities.

Groundwater

Fire Island National Seashore is underlain by a series of unconfined and confined groundwater aquifers recharged by precipitation. Within the southern reaches of Long Island, the Upper Glacial aquifer is an unconfined shallow aquifer and is the closest to the ground surface. This aquifer is characterized by newly formed, coarse sandy, highly permeable soils. In contrast, to the north the Upper Glacial aquifer on Long Island is underlain by glacial till formed during the last ice age. The water table on Fire Island is a thin (approximately 25-40 feet thick) freshwater lens and is immediately above the saline portion of the Upper Glacial Aquifer (McCormick and Associates 1975, Collier et al. 2005). The flow pattern of this freshwater lens is controlled primarily by the combined effect of wave action and tidal pumping. The combination of these processes elevates the water table near the ocean shore, resulting in lateral, gravitational movement away from the ocean towards the bay side. As a result, the groundwater along the shoreline seeps into the saline waters of the bay and ocean (Schubert 2007).

The depth of the water table on Fire Island is dependent on several factors, including the elevations (height) of dune formations and back dune swales. Other factors include precipitation inputs and community

wastewater recharging the lens, tidal fluctuations, and the degree of back bay seepage. In areas of low elevations, the water table may be exposed above the ground surface, creating freshwater surface waters where wind-blown erosion has formed depressional blow-outs in the landscape. Relative to sea level, the freshwater lens is generally at an elevation between 6 and 12 feet on Fire Island (Schubert 2007, USGS 2009).

Beneath the Upper Glacial Aquifer are several confined aquifer layers. The Gardiners Clay confinement layer occurs approximately 500 to 600 feet below grade. Below Gardiners Clay is approximately 1,000 feet of the Magothy aquifer followed by two other confining layers, the Raritan Clay formation and the Lloyds Sands aquifer, found from approximately 1,700 to 1,900 feet below grade to bedrock. The Magothy aquifer is the primary source of public water supply for Long Island (NYDEC 2009), while the Lloyds Sands aquifer supplies water to Jones Beach, Captree Island, and Robert Moses State Park (NPS 1992).

Potential contamination of the shallow groundwater aquifer presents the greatest threat to the health of the Fire Island ecosystem. Underground septic and cesspool systems are the most common method of wastewater treatment for the residential communities and the estimated 2.2 million annual visitors to the Seashore. Continued reliance on antiquated or otherwise substandard systems poses a serious threat to water quality through the release of contaminants such as nutrients, pathogens, and organic compounds.

These localized contaminants are laterally transferred to the ocean and back bay estuaries. Simulations of groundwater discharge from the shallow aquifer indicate that nearly 80 percent of the total discharge enters the back-barrier estuaries; the rest discharges to the ocean or below the seabed as subsea outflow (Schubert 2010). Shallow well monitoring across Fire Island has shown that in some locations total nitrogen (TN) concentrations were at least 10 times higher in groundwater down-gradient from at least two communities and the Watch Hill leach field compared to undeveloped areas of Fire Island. The high contribution of excess nitrogen "…could affect terrestrial and aquatic (freshwater and brackish) habitats and species that are adapted to the low nutrient concentrations generally found within and down gradient from undeveloped areas. (Schubert 2010)."

Freshwater Wetlands

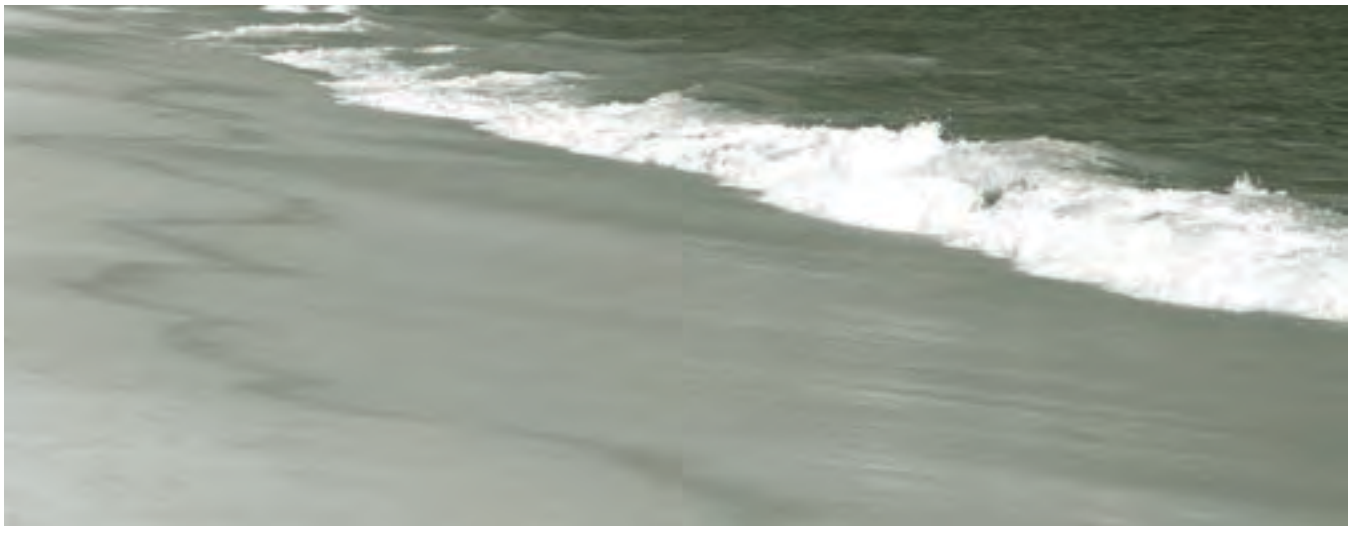
Approximately 112 acres of dunal wetlands occur on Fire Island, representing approximately 2 percent of the terrestrial habitat. According to the National Vegetation Classification System (NVCS) (Grossman et al. 1998), the following freshwater systems occur on Fire Island: Highbush Blueberry Swamp Shrub, Northern Interdunal Cranberry Swale, and Reedgrass Marsh (Klopfer et al. 2002). A fluctuating, high groundwater table is the primary source of hydrology driving the formation and functions of these systems.

The Highbush Blueberry Swamp Shrub is the most common freshwater wetland within the Seashore (Klopfer et al. 2002). This type of shrub wetland is found on both Fire Island and within the Floyd Estate and is characterized by highbush blueberry (*Vaccinium corymbosum*), swamp azalea (*Rhododendron viscosum*), and sweet pepperbush (*Clethra alnifolia*) mixed with several herbaceous species such as flat sedges (*Cyperus spp.*), beakrush *(Rhynchospora capitellata)*, marsh rush *(Juncus canadensis),* round-leaf sundew *(Drosera rotundifolia)*, bladderwort *(Utricularia subulata)*, and slender yellow-eyed grass *(Xyrus torta)*.

The Northern Interdunal Cranberry Swale wetlands occur as small, pond-like bodies of shallow water dominated by a partially submerged layer of cranberry *(Vaccinium macrocarpon)* and are found mostly in the Fire Island Wilderness.

The Reedgrass Marsh wetland occurs as a small patchwork of concentrated Phragmites australis and is found primarily in and around most wetland areas on both the Floyd Estate and Fire Island. Phragmites australis, a non-native, invasive plant, is becoming more widespread across the park. Cattail marshes occur in small patches across Fire Island.

The Red Maple-Blackgum Swamp association is the only forested wetland within the Seashore, and is found on both the William Floyd Estate and Fire Island (Klopfer et al. 2002, NPS 2009b). On Fire Island, it occurs in low elevations adjacent to small drainages, and at the William Floyd Estate it occurs adjacent to the tidal creeks. On Fire Island, Red Maple-Blackgum Swamp is found behind the secondary dune. Dominant plants include red maple *(Acer rubrum)*, blackgum *(Nyssa sylvatica)*, swamp azalea, sweet pepperbush, cinnamon fern *(Osmunda cinnamomea)*, marshpepper smartweed *(Persicaria hydropiper)*, Virginia bugleweed *(Lycopus virginicus)*, swamp dock *(Rumex verticillatus)*, and marsh St. John's-wort *(Triadenum virginicum)*.



Freshwater Ponds

A few freshwater ponds are located throughout the Seashore. These ponds are fishless with relatively good water quality; therefore, they are particularly important breeding areas for the few herpetological species on Fire Island and the many odonate (dragonflies and damselflies) species found in the area (Caldecutt 1997, Briggs et al. 2010). Ponds within the Seashore occur as interdunal swales and depressions formed from an exposed, fluctuating high water table and are characterized by Northern Interdunal Cranberry Swale vegetation. The largest pond within the Seashore, approximately 2 acres in size and more than 3 feet deep at the epicenter, is just west of the community of Kismet. This pond maintains permanent surface water; provides the highest-quality breeding habitat by freshwater aquatic species on Fire Island; and was the only pond found by Briggs et al. (2010) to be used for breeding Needham's skimmers *(Libellula needhami)*, a New York State-listed odonate.

Another freshwater pond of significance occurs at the western boundary of Fire Island Pines, near the Carrington house, and is associated with a large cranberry wetland. Caldecutt (1997) noted the presence of the common snapping turtle *(Chelydra serpentina)* at this pond, and believed spotted turtles *(Clemmys guttata)* may also use the pond, although none were detected. Other smaller ponds on Fire Island are within private communities and federal lands in Atlantique Beach, Point O'Woods, Watch Hill, and on the bay side of the Fire Island Wilderness. These systems may only be 0.1 acre in size when full of water, and the non-native invasive common reed grass *(Phragmites australis)* has been found along the pond edges. At the William Floyd Estate, several man-made ponds one freshwater, the others brackish are just landward of the tidal marsh. These systems were created decades ago for waterfowl hunting by members of the Floyd family. The man-made ponds are one acre or less in size and are fed by the exposed groundwater aquifer and direct rainfall.

Vegetation

In 2002, a detailed inventory of the vegetation within Fire Island was completed, based on the National Vegetation Classification System (NVCS) (Klopfer et al. 2002) (Table 3-1). The most common upland vegetative community type is the Northern Beach Grass Dune and Maritime Deciduous Scrub Forest (each 15 percent of the total). Northern Dune Shrubland is the third most common type (11 percent). The rarest vegetative community at Fire Island National Seashore is the Maritime Post Oak Forest found on the William Floyd Estate.

American beachgrass *(Ammophila breviligulata)* is the dominant plant species on the foredunes of Fire Island. Beach plum *(Prunus maritima)*, bayberry *(Myrica pennsylvanica)*, seaside goldenrod *(Solidago sempervirens)*, and poison ivy *(Toxicodendron radicans)* are commonly found on the leeward side of the primary dunes.

Maritime forests on barrier islands are generally formed near the back bay, where significant secondary dune structures covered with vegetation provide protection from oceanic salt spray and erosional forces. The Sunken Forest, located just west of Sailors Haven, exemplifies a rare, well-formed, old-growth maritime holly forest – one of only two such forests known in the world.[10] American holly (*Ilex opaca*) up to 300 years old dominates the community (Trocki 2008). Other species include blackgum (*Nyssa sylvatica*), sassafras (*Sassafras albidum*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), and pitch pine (*Pinus rigida*). Serviceberry (*Amelanchier canadensis*) and highbush blueberry (*Vaccinium corymbosum*) are the common shrubs while poison ivy (*Toxicodendron radicans*) and greenbriar (*Smilax spp.*) are common ground and climbing vine species. A series of studies concluded that since 1967 heavy deer browse has altered the understory composition of the forest. In 1967 sarsaparilla (*Aralia nudicaulus*), Canada mayflower (*Maianthemum canadense*), Starry False Solomon's seal (*Similacina stellate*), bracken fern (*Pteridium aquilinum*), Herb Robert (*Geranium robertianum*), and starflower (*Trientalis borealis*) were frequently associated with the herb layer (Art 1976, 1987, 1992). Several understory species documented in early vegetation surveys are thought to have been nearly extirpated from the area by deer browse.

10 The other old-growth maritime holly forest occurs at Sandy Hook in New Jersey, a unit of Gateway National Recreation Area.

Tidal marshes, the most abundant cover type in the park at 26 percent, occur along the back bay shoreline of Fire Island as broad depositional bands from historic storm overwash events (Klopfer et al. 2002). Smooth cordgrass (Spartina alterniflora) is the primary low-tide species, with salt meadow grass (Spartina patens) and spike grass (Disticlis spicata) found in the upper marsh. Sections of marsh along the back bay shoreline have been disturbed or disrupted due to dredging and erosion forces caused by bulkhead and marina construction.

Vegetative communities at the Floyd Estate are primarily the result of historic land uses such as farming, cultural plantings, and land-clearing operations. The property contains salt marsh habitat with salt bush (*Baccharis halimifolia*) and marsh elder (*Iva frutescens*) along the upper marsh fringe, similar to those communities found on Fire Island. Several open fields still remain, but others were allowed to revert to deciduous forests, the most recent of which are largely comprised of black locust (*Robinia pseudoacacia*), black cherry, red maple, pitch pine, blackgum in the overstory and greenbrier (*Smilax rotundifolia*), highbush blueberry, and red cedar in the understory. Older, more mature forest stands are characterized by white oak (*Quercus alba*), and hickory (*Carya cordiformis*). Table 3-1 provides a summary of the vegetative community types in the Seashore and their respective percent coverage (Klopfer et al. 2002).

To make the vegetation map easier to read in this format, the vegetation/habitat classifications described in the Klopfer 2002 Vegetation study were combined to create broader categories. These include:

Swamp

- Highbush Blueberry Shrub Swamp
- Acidic Red Maple Basin Swamp

Sparse Vegetation

- Northern Beach Grass Dune
- Beach Heather Dune
- Interdune Beachgrass-Beach Heather Mosaic
- Brackish Meadow
- Brackish Interdunal Swale
- Overwash Dune Grassland
- Northern Interdunal Cranberry Swale

Shrubland

- Maritime Vine Dune
- Northern Dune Shrubland
- Northern Salt Shrub
- Northern Sandplain Grassland

Forest

- Maritime Deciduous Scrub Forest
- Coastal Oak-Heath Forest
- Japanese Black Pine Forest
- Maritime Holly Forest
- Pitch Pine-Oak Forest
- Pitch Pine Dune Woodland
- Old Field Red-Cedar Forest
- Maritime Post Oak Forest

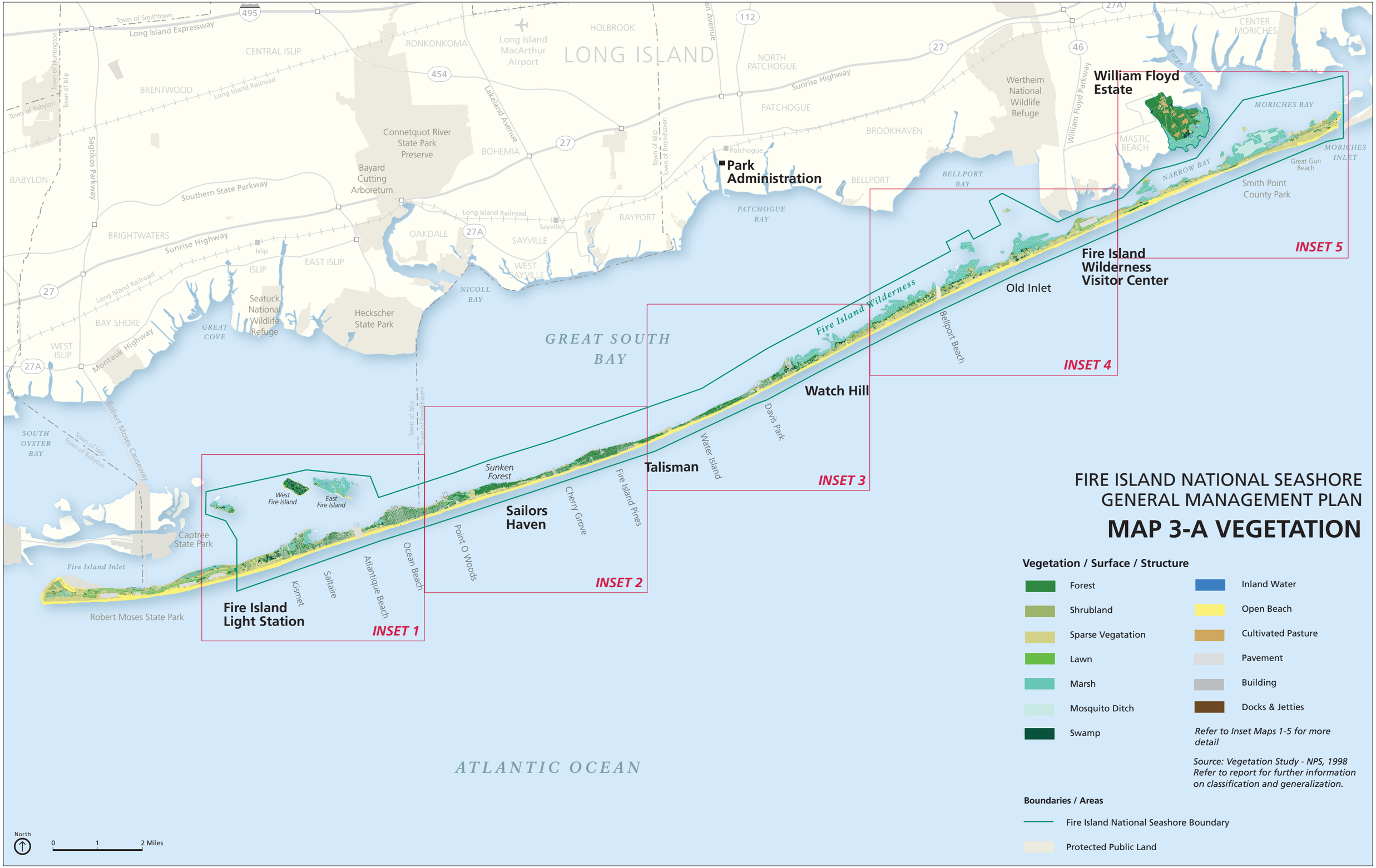
Marsh

- Low Salt Marsh
- High Salt Marsh
- Reedgrass Marsh

Pavement

- Paved Road
- Pavement/ Parking Area

Cultivated Pasture



FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN
MAP 3-A VEGETATION

Vegetation / Surface / Structure

- Forest
- Shrubland
- Sparse Vegatation
- Lawn
- Marsh
- Mosquito Ditch
- Swamp
- Inland Water
- Open Beach
- Cultivated Pasture
- Pavement
- Building
- Docks & Jetties

Refer to Inset Maps 1-5 for more detail

Source: Vegetation Study - NPS, 1998
Refer to report for further information on classification and generalization.

Boundaries / Areas

- Fire Island National Seashore Boundary
- Protected Public Land

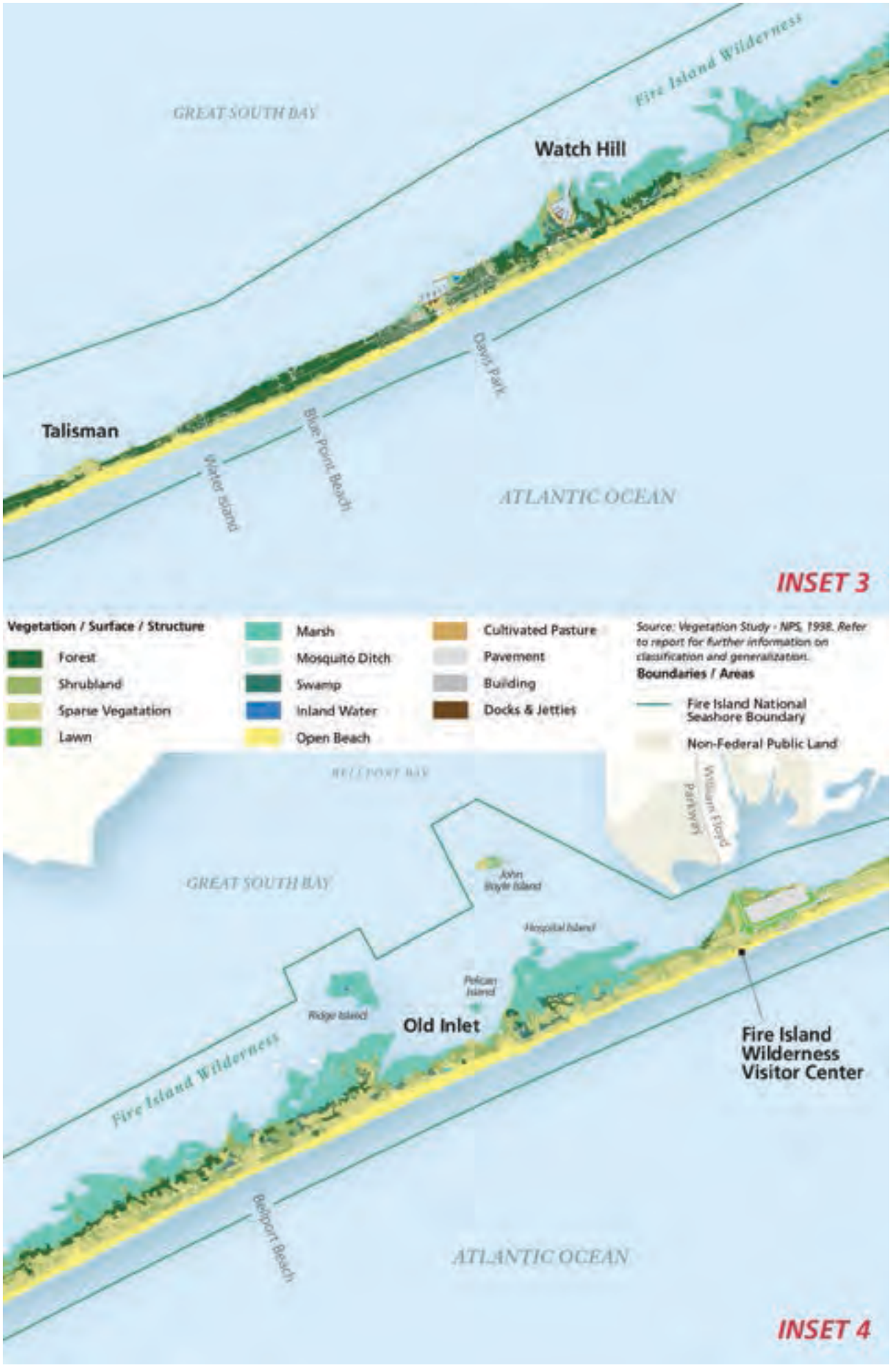
Vegetation / Surface / Structure

- Forest
- Shrubland
- Sparse Vegatation
- Lawn
- Marsh
- Mosquito Ditch
- Swamp
- Inland Water
- Open Beach
- Cultivated Pasture
- Pavement
- Building
- Docks & Jetties

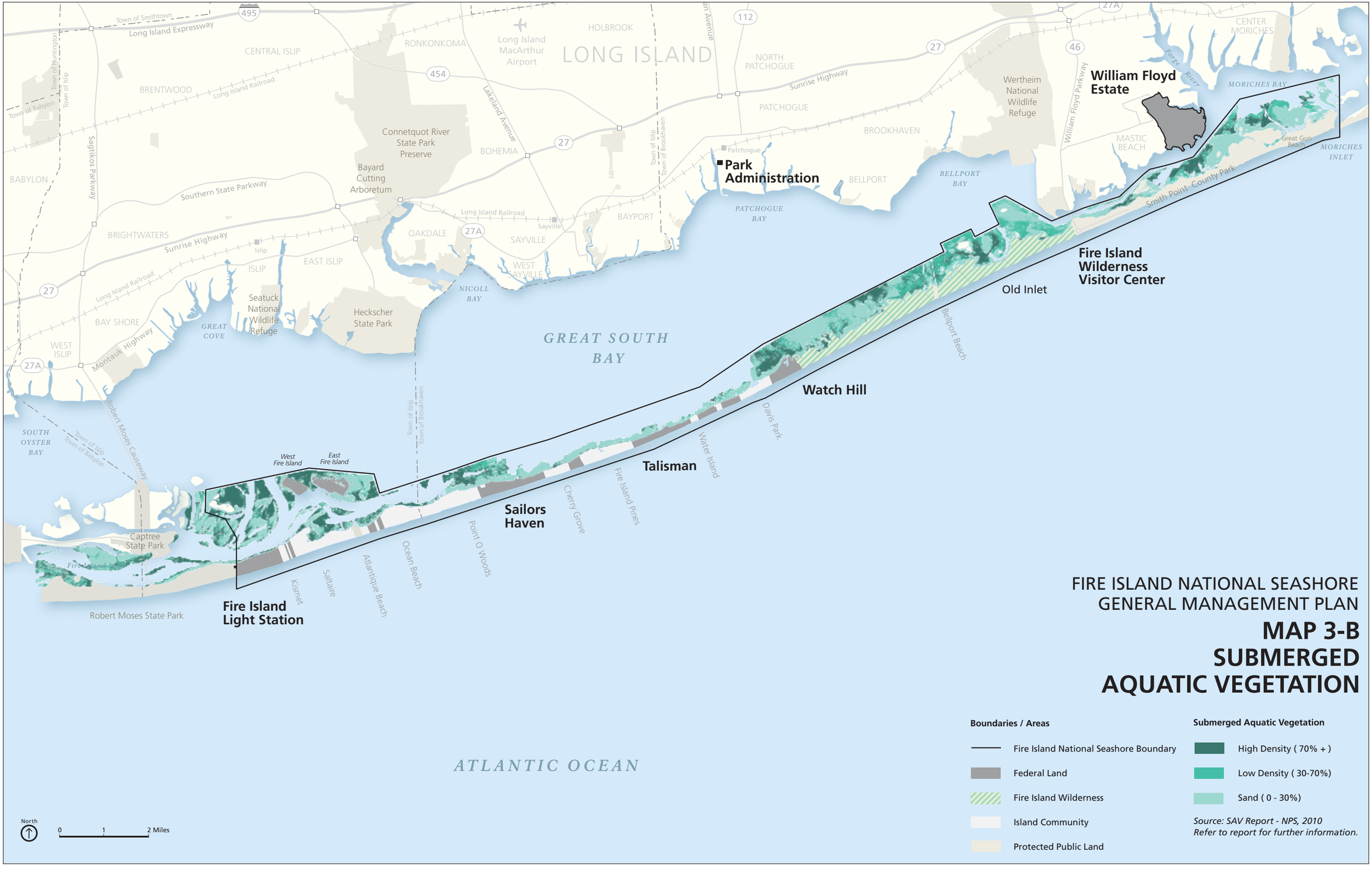
Source: Vegetation Study - NPS, 1998. Refer to report for further information on classification and generalization.

Boundaries / Areas

- Fire Island National Seashore Boundary
- Non-Federal Public Land


GREAT SOUTH BAY
Fire Island Wilderness
Watch Hill
Talisman
Davis Park
Blue Point Beach
Water Island
ATLANTIC OCEAN
INSET 3
Vegetation / Surface / Structure
Forest
Shrubland
Sparse Vegetation
Lawn
Marsh
Mosquito Ditch
Swamp
Inland Water
Open Beach
Cultivated Pasture
Pavement
Building
Docks & Jetties
Source: Vegetation Study - NPS, 1998. Refer to report for further information on classification and generalization.
Boundaries / Areas
Fire Island National Seashore Boundary
Non-Federal Public Land
BELLPORT BAY
GREAT SOUTH BAY
William Floyd Parkway
John Boyle Island
Hospital Island
Pelican Island
Ridge Island
Old Inlet
Fire Island Wilderness
Fire Island Wilderness Visitor Center
Bellport Beach
ATLANTIC OCEAN
INSET 4


William Floyd Estate
Smith Point County Park
ATLANTIC OCEAN
INSET 5
Vegetation / Surface / Structure
Forest
Shrubland
Sparse Vegatation
Lawn
Marsh
Mosquito Ditch
Swamp
Inland Water
Open Beach
Cultivated Pasture
Pavement
Building
Docks & Jetties
Source: Vegetation Study - NPS, 1998. Refer to report for further information on classification and generalization.
Boundaries / Areas
Fire Island National Seashore Boundary
Non-Federal Public Land



FIRE ISLAND NATIONAL SEASHORE GENERAL MANAGEMENT PLAN

MAP 3-B SUBMERGED AQUATIC VEGETATION

Boundaries / Areas

- Fire Island National Seashore Boundary
- Federal Land
- Fire Island Wilderness
- Island Community
- Protected Public Land

Submerged Aquatic Vegetation

- High Density (70% +)
- Low Density (30-70%)
- Sand (0 - 30%)

Source: SAV Report - NPS, 2010
Refer to report for further information.

TABLE 3-1. VEGETATIVE COMMUNITY TYPES AT FIRE ISLAND NATIONAL SEASHORE

Vegetation Type Area	Acres of Vegetation	Percent of Total Area (%)
Sparse Vegetation		**22.4%**
Northern Beach Grass Dune	617.8	14.9
Beach Heather Dune	184.1	4.5
Interdune Beachgrass – Beach Heather Mosaic	94.6	2.3
Brackish Meadow	13.6	0.3
Brackish Interdunal Swale	10.1	0.2
Overwash Dune Grassland	9.6	0.2
Northern Interdunal Cranberry Swale	8.2	0.2
Forest		**29.2%**
Maritime Deciduous Scrub Forest	604.9	14.8
Coastal Oak Health Forest	239.9	5.9
Japanese Black Pine Forest	189.3	4.6
Maritime Holly Forest	64.2	1.6
Pitch Pine – Oak Forest	45.5	1.1
Pitch Pine – Dune Woodland	37.1	0.9
Old Field Red Cedar Forest	7.2	0.2
Maritime Post Oak Forest	0.7	< 0.1
Shrubland		**11.3%**
Northern Dune Shrubland	450.2	11.0
Maritime Vine Dune	8.4	0.2
Northern Sandplain Grassland	4.0	0.1
Marsh		**29.2%**
Low Salt Marsh	432.4	10.6
High Salt Marsh	419.8	10.3
Reedgrass Marsh	338.0	8.3
Swamp		**2.2%**
Highbush Blueberry Shrub Swamp	78.8	1.9
Acidic Red Maple Basin Swamp Forest	12.8	0.3
Cultivated Pasture	**47.0**	**1.2%**

Six species of rare plants have been found at Fire Island National Seashore. These species are associated with upland and wetland vegetative community types. A list of these species, their preferred habitats, and listing/ranking is provided in Table 3-2.

▸ SPECIAL STATUS SPECIES

The NPS surveys state and federally listed plants within Fire Island annually, as feasible. As identified in Table 3-2, the 2012 survey included documentation of 26 seabeach amaranth plants and 50 seabeach knotweed *(Polygonum glaucum)* plants. Both populations have been in decline since 2003 (Trocki 2008). Data accumulated since 2008 indicate that the populations of these species have fluctuated around an average since 2006.

TABLE 3-2: FEDERAL AND STATE LISTED SPECIES AT FIRE ISLAND NATIONAL SEASHORE

Listed Plant	Federal Listing	State Listing	Global Rank	State Rank	Habitat Preference and Location on FIIS
Seabeach amaranth *(Amaranthus pumilus)*	T	E	G2	S2	Unvegetated, lower foredunes and beaches.
Seabeach knotweed *(Polygonum glaucum)*	-	R	G3	S3	Sandy beaches and dunes.
Swamp sunflower *(Helianthus angustifolius)*	-	T	G5	S2	Freshwater wetlands. Four small populations discovered in maritime freshwater interdunal swale habitat.
Slender marsh pink *(Sabatia campanulata)*	-	E	G5	S1	Freshwater marsh and interdunal swales. Single population of plants discovered on Fire Island in maritime freshwater interdunal swale habitat.
Rough rush-grass *(Sporobolus clandestinus)*	-	E	G5	S1	Drier swales of maritime dunes found near the Fire Island Lighthouse.
Dark-green sedge *(Carex vanusta)*	-	E	G4	S1	Wet meadows, salt marshes, swamps or other wetland habitats near the coast. Single location in New York State along the upper salt marsh at the William Floyd Estate.
Marsh straw sedge *(Carex hormathodes)*	-	T	G4 G5	S2	Dry or wet coastal forests; population discovered at the William Floyd Estate.
Golden dock *(Rumex fueginus)*	-	E	G4 G5	S1	Coastal wetlands near Point o' Woods
Narrow-leaf sea- blite *(Suaeda linearis)*	-	E	G5	S1	Fire Island Wilderness and Watch Hill saltmarsh
Spring ladies'-tresses *(Spiranthes vernalis)*	-				Northern interdunal cranberry swale; 2 populations found near Fire Island Lighthouse

Listings **E: Endangered; T: Threatened; R: Rare**

Ranks **S1: Critically imperiled/especially vulnerable to extinction; G2/S2: Imperiled due to rarity/vulnerable to extinction; G3/S3: Uncommon or local; G4: Apparently secure; G5: Demonstrably secure**

The New York Natural Heritage Program cites 15 rare ecological community types in Fire Island National Seashore. These systems are related to coastal and barrier island ecosystems, and although they are relatively common on Fire Island, they are not found in other parts of New York State. Table 3-3 provides a summary of these rare community types (Klopfer et al. 2002, Trocki 2008).

TABLE 3-3: RARE ECOLOGICAL COMMUNITY TYPES AT FIRE ISLAND NATIONAL SEASHORE

Community Type	Global Rank	State Rank	Location on FIIS
Maritime Beach	G5	S3/S4	Unstable sand shores above mean high tide
Maritime Dunes	G4	S3	Comprises a variety of dunal communities to include others listed below. Majority of maritime dunes are occupied by beach grasses such as Ammophila breviligulata.
Beach Heather Dune	G2/G3	S1	Stabilized backdunes on Fire Island.
Maritime Heathland	G3	S1	Stabilized backdunes on Fire Island
Overwash Dune Grassland	G2/G3	No listing	Overwash areas within the wilderness
Northern Sandplain Grassland	G2	No listing	Interior portion of the wilderness and an area southwest of cemetery at WFE.
Maritime Grassland	G2/G3	S1	Part of Maritime Dunes complex found along the seashore of Fire Island
Maritime Deciduous Scrub Forest	G2/G3	No listing	Scrub community influenced by salt spray found behind the primary dunes on Fire Island
Salt Scrub Community	G5	S4	Landward edges of salt marshes on the bay side of Fire Island
High Salt Marsh	G5	S3/S4	Found between Low Marsh and high tide on the bay side of Fire Island and at the WFE
Salt Panne	G5	S3	Small, shallow depressions within the high salt marsh.
Pitch Pine Dune Woodland	G2/G3	S1	Sand dunes adjacent to shrubland or salt marsh on Fire Island.
Maritime Post Oak Forest	G3	S2	Sandy banks off of Moriches Bay on the WFE
Maritime Holly Forest	G1/G2	S1	Secondary dunes on the bay side near Sailors Haven Visitors Center on Fire Island, also known as "Sunken Forest"
Northern Interdunal Cranberry Swales	G2	No listing	Characterized as a Maritime Dune Wetland found in small seasonally flooded depressions and swales behind the primary dunes on Fire Island.
Maritime Freshwater Interdunal Swales	G3/G4	S2	Low-lying depressions behind the foredunes on Fire Island.

Ranks **S1: Critically imperiled/especially vulnerable to extinction; G2/S2: Imperiled due to rarity/vulnerable to extinction; G3/S3: Uncommon or local; G4: Apparently secure; G5 Demonstrably secure**

▸ NON-NATIVE INVASIVE PLANTS

Non-native invasive species are common throughout the Fire Island communities and on federal lands within Fire Island National Seashore. The abundance and spread of non-native invasive species are generally associated with human-related disturbances and escaped horticultural plantings with the capacity to tolerate dry, sandy conditions and salt spray. Historically, human-induced alterations on the William Floyd Estate (timbering, agriculture, horticulture) have made this property particularly vulnerable to the spread of non-native invasive plants. An invasive species inventory was performed at the Seashore in 2002 (Schwager 2002), followed by continued survey work undertaken as part of an Integrated Pest Management Plan. Based on the 2002 survey, invasive species common to the Seashore are predominantly non-native and include autumn olive *(Eleagnus umbellata)*, spotted knapweed *(Centaurea maculosa)*, Japanese honeysuckle *(Lonicera japonica)*, bamboo spp. *(Phyllostachys sp.)*, Japanese knotweed *(Polygonum cuspidatum)*, multiflora rose (Rosa multiflora), Oriental bittersweet *(Celastrus orbiculatus)*, garlic mustard *(Alliaria petiolata)*, Japanese barberry *(Berberis thunbergii)*, and mugwort *(Artemesea vulgaris)*. Three of the most widespread invasive plants are present in such abundance and density to have been given their own vegetative association classification by Klopfer et al. et al. (2002). These include common reed *(Phragmites australis)*, Japanese black pine *(Pinus thunbergii)*, and black locust *(Robinia pseaudoacacia)*. The reedgrass marsh habitat type is prolific across the park, making it the sixth most common habitat type (Klopfer et al. 2002). The plant species identified in these surveys are listed in Table 3-4. Of this list, black locust is the only native species that likely originated from the Appalachians and/or mid-west (Klopfer et al. 2002).

TABLE 3-4: INVASIVE PLANT SPECIES AT FIRE ISLAND NATIONAL SEASHORE (2007)

Common Name	Scientific Name
Autumn olive	Eleagnus umbellata
Black locust	Robinia pseudoacacia
Chinese lespedeza	Lespedeza cuneata
Chinese/ Japanese wisteria	Wisteria spp.
Common mullein	Verbascum thapsus
Common reed	Phragmites australis
Garlic mustard	Alliaria petiolata
Japanese barberry	Berberis thunbergii
Japanese black pine	Pinus thunbergiana
Japanese honeysuckle	Lonicera japonica
Japanese knotweed	Polygonum cuspidatum
Mugwort	Artemisia vulgaris
Multiflora rose	Rosa multiflora
Norway maple	Acer platanoides
Oriental bittersweet	Celastrus orbiculatus
Spotted knotweed	Centaurea maculosa

▸ FIRE MANAGEMENT

Historical occurrences and frequency of wildland fires within the Seashore are not well documented, and biological influences caused by fire are relatively unknown. The combination of volatile plant biomass, dense vegetative communities, coastal winds, droughty soils, areas of densely populated wood structures, and the general lack of road access make fire suppression on Fire Island difficult. Since 1974 fires on federal lands have been recorded by Seashore staff. In general, fires in the Seashore have been small brush fires that have been easily contained. On average, one of these fires occurs within the Seashore annually, all of which have been of anthropogenic origin.

NPS Directors Order (DO-18) "Wildlife Fire Management" provides guidance related to wildland fire. Specifically, DO-18 (NPS 2002d) requires that all parks with vegetation capable of sustaining fire develop a fire management plan (FMP). Pursuant to NPS policies, in 2010, the Seashore updated its FMP. The FMP considers overall park management objectives, the beneficial use of prescribed fire, the suppression of wildfire, fuel hazards,

and restoration. The potential influence of climate change on wildland fire at Fire Island National Seashore has not been evaluated.

Wildlife and Wildlife Habitat

Fire Island National Seashore encompasses a mosaic of habitats fragmented among intensively developed areas of the Fire Island. The ocean, bay, beaches, dunes, estuaries, tidal mudflats, scrub, and forested areas found on Fire Island and at the William Floyd Estate provide habitat for diverse populations of marine and terrestrial wildlife species. These species, as well as special-status species and species that require special management at the Seashore are described later in this section.

The Seashore is one of the few national parks that allows public hunting. Hunting is permitted on Fire Island only with a permit issued by Seashore staff for a fee. No hunting is allowed at the William Floyd Estate. Hunting and fishing seasons and limits are established and regulated by the New York Department of Environmental Conservation (NY DEC). NPS park rangers have the policing authority to enforce state hunting and fishing laws within the Seashore. In 2011, a total of 65 hunting permits were issued, and 78 permits were issued in 2012. The majority of these permits were issued for the East District of the Fire Island associated with water fowl hunting near the wilderness.

Hunting, fishing, and shellfishing are important recreational pastimes in the local area and at the Seashore. "Party" boats, charter boats, and private vessels provide recreational fishing on the Great South Bay near Fire Island National Seashore (NPS 2009b). Surf and jetty fishing is the most common form of fishing on the ocean side of Fire Island. Although a recreational marine fishing license is not required by the State of New York to surf fish and fish in the Great South Bay, NYS requires that anglers register with the no-fee recreational marine fishing registry and be aware of fishing seasons and catch limits established by the State. Anglers are encouraged to voluntarily report their catch in the State's on-line angler logbook. No fishing is allowed within NPS-maintained marinas or designated lifeguard beach swimming areas.

NYS receives minimal data from those permitted to recreationally hunt and/or fish within the Seashore, and no data are available on the overall effects to local fish and game populations. In the absence of relevant information, it is unclear whether summer time recreational fishing poses a serious threat to the fisheries resources within the Seashore. Some populations, like winter flounder, are known to be in long-term decline (NPS 2009b).

Although commercial fishing is not specifically provided for at Fire Island National Seashore, shellfish populations in and around the Seashore appear to have been notably affected by commercial fishing. The Great South Bay was once a premier harvesting center for commercial shellfish. Important commercial shellfish species included hard clams, oysters (*Crassostrea virginica*), bay scallops (*Argopecten irradians*), and blue crabs (*Callinectes sapidus*) (NPS 2009b). Today, the shellfish harvest has dramatically declined, possibly due to a combination of overharvesting and a decline in water quality. This decline appears to have started in the late 1940s and early 1950s, although an exact timeframe has not been determined. For instance, hard clam harvest in the Great South Bay was estimated to exceed 11 million pounds in 1947. This harvest declined to less than 2.2 million pounds in 1954, and by 2003, the harvest was estimated at 88,000 pounds. The estimated harvest originating from Seashore waters is unknown.

The Nature Conservancy (TNC) is the principal sponsor supporting ongoing shellfish restoration within a portion of Great South Bay. TNC currently owns approximately 21 square miles of bay bottomland between the Long Island shoreline near Sayville south to Fire Island from Ocean Beach to Talisman. Approximately one-sixth of the TNC property falls within the Seashore boundary. No public shellfishing is permitted within the TNC property.

▸ MAMMALS

Nineteen species of marine mammals have been recorded within the boundaries of the Seashore. Identified species include whales, porpoises, dolphins, and seals. The harbor seal *(Phoca vitulina)* is a regular winter visitor at both the Fire Island and Moriches Inlets. Three species of endangered whales have been reported in the waters offshore of Fire Island: fin whale *(Balaenoptera physalus)*, humpback whale *(Megaptera novaeangliae)*, and northern right whale *(Eubalaena glacialis)* (Trocki 2008).

In 1974, 17 species of terrestrial mammals were recorded at Fire Island National Seashore. Published reports documenting species ranges (Whitaker and Hamilton 1998) reviewed in combination with the Seashore's species list from the 1970s identified 28 species of mammals likely to occur within Fire Island National Seashore. Species common to the Seashore,

including the William Floyd Estate, include white- tailed deer (*Odocoileus virginianus*), eastern cottontail rabbit (*Sylvilagus floridanus*), red fox (*Vulpes vulpes*), white-footed mouse (*Peromyscus leucopus*), meadow vole (*Microtus pennsylvanicus*), raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), eastern gray squirrel (*Sciurus carolinensis*), muskrat (*Ondatra zibethicus*), shrew (*Sorex cinereus, Blarina brevicauda*), weasel (*Mustela spp.*), mink (*Neovison vison*), and a variety of bats (*Myotis spp., Lasiurus spp., and others*). A separate discussion on white-tailed deer is provided below.

▸ REPTILES AND AMPHIBIANS

In 2002 and 2003, reptiles and amphibians were surveyed on Fire Island in various habitat types. A total of 12 species were identified: 2 migrant and 10 residents. The resident species represented 90% of species that were believed to occur on Fire Island based on historical records. The resident species consisted of three anurans: Fowler's toad *(Bufo fowleri)*, southern leopard frog *(Rana sphenocephala)*, and the American bullfrog *(Rana catesbiena)*, a recent arrival; five turtles: snapping turtle *(Chelydra serpentine)*, Eastern mud turtle (*Kinosternons subrubrum*), Eastern box turtle (*Terrapene c. Carolina*), spotted turtle *(Clemmys guttata)*, and Northern diamond-backed terrapin *(Malaclemys t. terrapin)*; and three snakes: Northern black racer (Coluber constrictor), Eastern garter snake *(Thamnophis s. sirtalis)*, and Eastern hog-nosed snake *(Heterodon platirhinos)*. The mud turtle is listed as endangered by New York State, and the box turtle, spotted turtle, and hognose snake are of Special Concern (NYDEC 2000). The most common species on Fire Island are the Northern black racer, Fowler's toad, and box turtle.

The two migrant species, the loggerhead sea turtle *(Caretta caretta)* (NY and federally Threatened), and leatherback sea turtle *(Dermochelys coriacea)* (NY and federally Endangered), were found washed up dead on the beach. Five species of sea turtles have been documented within the waters off of Long Island during the warm summer months although none have been found to nest on local beaches. These species include the loggerhead sea turtle *(Caretta caretta)*, green sea turtle *(Chelonia mydas)*, leatherback sea turtle, hawksbill sea turtle *(Eretmochelys imbricate),* and Kemp's Ridley sea turtle *(Lepidochelys kempii)*. All five turtle species are designated on both federal and state lists as protected threatened and endangered species.

In 2002 a similar survey conducted at the William Floyd Estate found 11 reptiles and amphibians representing 46 percent of historically occurring species. This included two salamanders: the four-toed salamander (*Hemidactylium scutatum*) and the Eastern red-backed salamander (*Plethodon cinereus*); one anuran: spring peeper (*Pseudacris crucifer*); four turtles: snapping turtle, painted turtle (*Chrysemys picta*), Eastern box turtle, and Northern diamond-backed terrapin; and four snakes: Eastern garter snake, Northern brown snake (*Storeria dekayi*), Northern black racer, and Eastern milk snake (*Lampropeltis triangulum*). At the William Floyd Estate the Eastern box turtle is a State-listed species of Special Concern (NYDEC 2000). In addition, population trends are showing declines for many species that were once common, such as the Northern black racer and Eastern milk snake. The most common species at the William Floyd Estate are the Eastern box turtle and the Eastern garter snake.

▸ BIRDS

Habitats within the Fire Island National Seashore are important refuge for a wide variety of migratory and resident birds. A total of 333 avian species have been observed within the Seashore; 67 have been documented to breed within the Seashore (Mitra and Putnam 1999, Trocki 2008). The Seashore is within the Atlantic Flyway, a major North American migratory bird route that spans the northern habitats of the Arctic islands, coastal Greenland, and Canada to as far south as Jamaica and South America (Bird and Nature 2009). The Seashore

provides a resting and feeding area for migratory birds traveling this route.

Tidal marshes and mudflats provide habitat for thousands of migratory birds, such as dowitcher (*Limnodromus spp.*) and plovers (*Pluvialis spp., Charadrius spp*). Many species of sandpipers (*Calidris spp.*) occur, including sanderling (*Calidris spp.*), dunlin (*Calidris alpina*), and the severely declining red knot (*Calidris canutus*) (Trocki 2008). Birds that breed in or near Fire Island's saltmarshes include American Black Duck (*Anas rubripes*), clapper rail (*Rallus longirostris*), and willet (*Catoptrophorus semipalmatus*) (Mitra and Putnam 1999; Niedowski 2000). Seaside sparrow (*Ammodramus maritimus*) and sharp-tailed sparrow (*Ammodramus caudacutus*) nest directly in the saltmarsh. Red-winged blackbirds (*Agelaius phoeniceus*) commonly nest in the taller shrubs along the upper saltmarsh margin. Other birds often seen and heard in the saltmarsh include barn and tree swallows (*Hirundo rustica, Tachycineta bicolor*), gray catbird (*Dumetella carolinensis*), and common yellowthroat (*Geothlypis trichas*). In addition to those that nest in saltmarshes, numerous other birds utilize this habitat as a food source (e.g., cordgrass, insects, invertebrates, small fishes, etc.) such as glossy ibis (*Plegadis facinellus*), great egret (*Ardea alba*), green heron (*Butorides striatus*), laughing gull (*Larus atricilla*), snowy egret (*Egretta thula*), and terns (*Sterna spp.*).

Fire Island National Seashore also is a valuable habitat source for wintering and nesting waterfowl. During the winter, tidal creeks and the bay are frequently used by a wide variety of migrating diving ducks such as the greater scaup (*Aythya marila*) and common goldeneye (*Bucephala clangula*). The Seashore serves as wintering habitat for common loons (*Gavia immer*), red-breasted mergansers (*Mergus serrator*), black duck (*Anas rubripes*), bufflehead (*Bucephala albeola*), brant (*Branta bernicla*), and Canada geese (*Branta Canadensis*) as well as a variety of scoters (*Melanitta, spp.*) and cormorants (*Phalacrocorax spp.*).

Open-water ponds at the William Floyd Estate, created decades ago for waterfowl hunting, provide refuge for waterfowl during harsh winter weather. These areas are also used by geese (*Chen caerulescens*, *Branta canadensis*) and dabbling ducks such as the mallard (*Anas platyrhynchos*), black duck, American widgeon (*Anas Americana*), and green-winged teal (*Anas crecca*), some of which nest at the ponds.

Dense shrub thickets and forests within the back dunes and swales within the Seashore are home to several songbirds such as the song sparrow (*Melospiza melodia*), gray catbird, brown thrasher (*Toxostoma rufum*), mourning dove (*Zenaida macroura*), northern cardinal (*Cardinalis cardinalis*), northern mockingbird (*Mimus polyglottos*), redwing blackbird (*Agelaius phoeniceus*), and eastern towhee (*Pipilo erythrophthalmus*). White-throated sparrow (*Zonotrichia albicollis*) and yellow rumped warbler (*Dendroica coronate*) are occasionally found during the winter. (Trocki 2008).

Migrating and wintering birds of prey also are inhabitants of Fire Island National Seashore. The northern harrier (*Circus cyaneus*) and American osprey (*Pandion haliaetus*) may use marsh habitats on the island for nesting, while short-eared owls (*Asio flammeus*), long-eared owls (*Asio otus*), and snowy owls (*Nyctea scandiaca*) are occasional winter inhabitants. Other birds of prey using the park may include the red-tailed hawk (*Buteo jamaicensis*) and the bald eagle (*Haliaeetus leucocephalus*)(Trocki 2008). Fire Island is one of the best-known hawk migration areas on the Eastern seaboard. Peregrine falcons (*Falco peregrinus*), merlins (*Falco coumbarius*), Cooper's hawks (*Accipiter cooperii*), sharpshinned hawks (*Accipiter striatus*), harriers (*Circus spp.*), and short-eared owls (*Asio flammeus*) also winter on Fire Island.

▸ SPECIAL STATUS SPECIES

Fire Island National Seashore is used by an array of special-status species including birds, reptiles, insects, and marine animals (Trocki 2008). Listed species can be found in Table 3-5. Federal- and state-listed species include the Piping Plover (*Charadrius melodus*), the roseate tern (*Sterna dougallii*), the least tern (*Sterna antillarum*), and the common tern (*Sterna hirundo*). All four are shorebirds that rely on maritime beach and dunes for nesting between March and July. Birds have been found to nest at differing locations from year to year, but the Fire Island Wilderness and several of the bay islands appear to be the most popular nesting sites. Each year, nest sites on Fire Island are partitioned with posted signs and fencing to prohibit visitors from entering.

Seashore staff perform annual surveys of nesting piping plovers and least terns on Fire Island beaches, and annual surveys of other nesting colonial waterbirds throughout all Fire Island beaches and bay islands in cooperation with NYS DEC's Long Island Colonial Waterbird Survey. NPS began monitoring Piping Plover in 1993. From 1993 to 2012 there have been from one to 25 breeding pairs that have fledged from 0 to 25 chicks. In 2012, 12 nesting pairs of Piping Plover were recorded in the Seashore. Storm overwash, predation, and abandonment have all been factors in nest failures in the years since surveys began.

The eastern mud turtle (*Kinosternon subrubrum*), listed as State endangered, is one of the rarest turtle species in New York, which is the northern extent of its range. Only five populations are known to exist on Long Island (NYNHP, Trocki 2008). Eastern mud turtles have been observed within Watch Hill and the wilderness area on Fire Island.

Two state-listed bird species within Fire Island National Seashore are classified as species of special concern and include the black skimmer (*Rynchops niger*) and the seaside sparrow (*Ammodramus maritimus*). The black skimmer is a colonial nesting water bird that has nested on Fire Island's bay islands and other beach habitats on Fire Island. It relies on the tidal creeks and estuaries for foraging. The seaside sparrow exclusively relies on the brackish marsh for nesting and foraging habitat found on the bay side of Fire Island, bay islands, and at the Floyd Estate.

TABLE 3-5. RARE ANIMAL SPECIES KNOWN TO RELY ON HABITATS AT FIRE ISLAND NATIONAL SEASHORE

Community or Species Name	Federal Listing	NY State Listing	Global Rank	State Rank
Northern Right Whale *(Eubalaena glacialis)*	E	E	G1	SNA
Fin Whale *(Balaenoptera physalus)*	E	E	G3G4	S1
Humpback Whale *(Megaptera novaeangliae)*	E	E	G4	SNA
Great Egret *(Ardea alba)*			G5	S2
Snowy Egret *(Egretta thula)*			G5	S2S3
Northern Harrier *(Circus cyaneus)*		T	G5	S3B/ S3N
American Osprey *(Pandion haliaetus)*		SC	G5	S4B
Piping Plover *(Charadrius melodus)*	T	E	G3	S3
Roseate Tern *(Sterna dougallii)*	E	E	G4	S1
Common Tern *(Sterna hirundo)*		T	G5	S3
Least Tern *(Sterna antillarum)*		T	G4	S3
Black Skimmer *(Rynchops niger)*		SC	G5	S2
Short-eared Owl *(Asio flammeus)*		E	G5	S2
Seaside Sparrow *(Ammodramus maritimus)*		SC	G4	S2S3
Loggerhead *(Caretta caretta)*	T	T	G3	S1N
Green Turtle *(Chelonia mydas)*	T	T	G3	S1N
Hawksbill Sea Turtle *(Eretmochelys imbricata)*	E	E	G3	SNA
Leatherback *(Demochelys coriacea)*	E	E	G2	S1N
Eastern Mud Turtle *(Kinosternon subrubrum)*		E	G5	S1

Federal / NYS Listing **E: endangered; T: threatened; R: rare; SC: species of concern (NYS only)**

Global / State Ranks **G5: demonstrably secure; G4/S4: apparently secure; G3/S3: uncommon or local; G2/S2: imperiled due to rarity / vulnerable to extinction; G1/S1: critically imperiled / especially vulnerable to extinction; SNA: a visitor to the state but not a regular occupant, or a species that is predicted to occur in NY but that has not been found; N: indicated migratory status of a migratory species when it is not breeding in NY.** *Source: Trocki 2008 and New York Natural Heritage Program 2007*

▸ MOSQUITOES

Fire Island National Seashore is rich with moist and wet habitats conducive to the breeding habits of approximately 25 species of mosquitoes. In the 1960s when the Seashore was first established, management objectives for Fire Island National Seashore dismissed pesticide control of mosquitoes as a nuisance species for fear of harming the local ecology. With the discovery of mosquito-borne diseases, such as West Nile Virus, Eastern Equine Encephalitis Virus, and Cache Valley Virus, Seashore staff recognized a greater need to monitor park mosquito populations, manage natural processes within the Seashore, and assist in the protection of visitor and resident health. In response, the NPS teamed with Suffolk County Vector Control to address mosquito-borne disease risks through the creation of a mosquito surveillance and management program first implemented in 1998. This program, still in effect, is implemented annually through the Seashore's Mosquito Action Plan and Surveillance Protocols (Protocols). The Seashore uses three levels of management actions to address mosquito-related health threats under different scenarios: 1. surveillance and education; 2. moderate disease risk; and 3. high disease risk. The NPS is collaborating with Suffolk County to develop protocols that define all aspects of mosquito control on all Seashore lands.

Surveillance is performed annually throughout various sections of the Seashore using carbon dioxide-baited light traps and gravid traps. These traps are designed to capture host-seeking and egg-bearing females to evaluate trends in mosquito population numbers and to measure the percentage of disease-carrying mosquitoes. The results of the surveillance program are then used to formulate the protocols. The Seashore summarizes the findings and actions taken to protect the visitors from mosquito-borne diseases in annual reports. Every year between 1998 and 2012 (except for the years 2007 and 2011) West Nile Virus was isolated from mosquitoes captured through the Seashore's mosquito surveillance program within the park boundaries. Additionally, the Cache Valley Virus was discovered in 2003 at Watch Hill.

▸ TICKS

Fire Island is host to several tick species including the lone star tick (*Amblyomma americanum*), the American dog tick (*Dermacentor variabilis*), and the deer tick (*Ixodes scapularis*) (also known as the black-legged tick). Ticks occur in high numbers across the Seashore and are a particular concern as vectors of bacterial diseases to humans. Such diseases include anaplasmosis, ehrlichiosis, babesiosis, Rocky Mountain spotted fever, and Lyme disease (CDC 2010).

The tick most common at the Seashore is the lone star tick, which has been shown to carry ehrlichiosis and possibly other diseases. Deer ticks have been identified as carriers for Lyme disease, anaplasmosis, and babesiosis. Ticks become carriers for diseases from the hosts they feed on. For example, the deer tick acquires the Lyme disease pathogen, *Borrelia burgdorferi*, primarily from the white-footed mouse (*Peromyscus leucopus*) and other small mammals. White-tailed deer do not carry the Lyme disease pathogen but serve as an important host for all tick lifestages, especially the adult stage, helping to perpetuate the tick population.

In addition to hosts, the habitat and climatic conditions are important for tick survival. On Fire Island, deer ticks have been found in higher numbers within deciduous and coniferous wooded habitats where relative humidity is higher compared to open habitats (Ginsberg and Zhioua 1996). Lone star ticks are common in most habitat types and can tolerate more open habitats unlike deer ticks. In a study in 1996, *B. burgdorferi* was isolated from one-third of adult deer ticks collected from Fire Island (Ecohealth, Inc. 1998). Since then, other diseases like ehrlichiosis have also been documented. The threat of these diseases has affected levels of visitation, particularly at the William Floyd Estate.

CULTURAL RESOURCES

Cultural Landscapes

Since prehistory, Fire Island and southern Long Island have been the scene of human use and occupation. During the entire course of human use and occupation of Fire Island, the natural landscape has been altered or manipulated through natural events and human activity.

The present landform known as Fire Island represents a stabilized landform dating back no earlier than 8,000 B.P. (before present). By 8,000 years ago, known archaeologically as the Archaic era, Fire Island was characterized by much the same landscape as today. The inhabitants of the island were moving between it and Long Island, exploiting the resources of the bay, Fire Island, and the Atlantic Ocean, similar to the hunters and fisherman in the recent historic period.

The pattern of resource exploitation on both Fire Island and the bays, with its emphasis on fishing, hunting, and limited agriculture continued uninterrupted for the next 8,000 years. The Native Americans were effectively displaced by the English colonists during the Colonial period; other European groups vied for fishing grounds in the bay and further off-shore; shellfish harvesters sought clams and other shellfish in the tidal estuaries; and stockman grazed cattle on the marshes of Fire Island. As agricultural activity decreased throughout the Long Island area, the need for some of the agricultural products or by-products of Fire Island was reduced.

Beginning in the early 1800s, various structures including huts, a fish processing factory, homes, hotels, docks, boardwalks, and inns were erected on Fire Island. In 1827, a federal lighthouse was erected on the west end of Fire Island near the Fire Island Inlet. Later, the U.S. Life-Saving Service built station houses along the length of Fire Island to assist mariners. During the summer months, the family of the station crews would live in small cabins built on these reservations.

One of the first established communities on Fire Island was Point o' Woods, established by the Chautauqua Assembly circa 1898. Other communities were established in the late 1800s and early 1900s. The largest growth in communities and population followed World War II. The number of separate communities on Fire Island eventually stabilized with the current 17 communities. However, a number of other communities ceased to exist. Fire Island's landscape still bears the evidence of their existence.

Fire Island today hosts the Robert Moses State Park (initially named Fire Island State Park, established in 1908) and Fire Island National Seashore (established in 1964), which has within its boundary Smith Point County Park, three municipal beaches, and the 17 distinct pre-existing residential communities.

▸ FIRE ISLAND LIGHT STATION

The NPS completed the Cultural Landscapes Inventory (CLI) for the Fire Island Light Station in 2004. In 1981, the Light Station was listed in the National Register of Historic Places (NRHP). The 2004 CLI identified an expanded Light Station tract, comprising approximately 244 acres and 13 buildings, structures, and other character-defining features, including historic sand trails that contribute to the significance of the property as a cultural landscape eligible for listing on the National Register. The CLI also recommended that the tract be listed as a historic district, and that the period of significance for the cultural landscape be expanded to include the years 1826 through 1960. The NY State Historic Preservation Officer (SHPO) concurred with the CLI in 2005.

At this time, the NPS has completed an amendment to the National Register Nomination for the Light Station. The amendment was reviewed and the NY SHPO concurred with the determination of the NPS. The boundary increase for the Fire Island Light Station Historic District was listed in the NRHP on January 29, 2010.

From the construction of the first Lighthouse in 1826 through the decommissioning of the Light Station in 1973, the use of this site was continuously associated with and supportive of maritime navigation and communications. Other land use on the site varied over time, both before and during the maritime navigation period,

including agricultural use up to the mid-19th century, and commercial and recreational use from the mid-19th century until the late 1930s.

The Fire Island Light Station tract is bounded on the north by Great South Bay, on the east by the community of Kismet, on the south by the Atlantic Ocean, and on the west by Robert Moses State Park. This tract includes the Lighthouse Station proper and its associated structures and the U.S. Coast Guard Annex, part of the original Radio Compass Station. The landscape of the tract may be characterized as a combination of thicket, dune, and beach. Vegetation on the site is a mixture of trees, shrubs, and grasslands that are adapted to survive in the wind and salt spray of the local environment. A few clusters of low-growing trees are near the buildings on the site, while shrubs are more extensive, spreading along the thicket and dune zones, where they are interspersed with grasslands.

Historically, the tract's spatial organization and circulation were oriented to water access via the shoreline and the Great South Bay, where boat docking was feasible. These water transportation facilities were improved with piers in the mid- to late-19th century, when the tract included a popular hotel. Regarding other modes of circulation on the property, the use of boardwalks is documented as early as 1827, and more recent boardwalks continue to be used today. By 1895, a short rail line was constructed to facilitate material movement to the Light Station and Radio Compass Station from the shoreline and from piers along the bay. The rail line and piers were gradually supplanted in the 20th century by the Burma Road, which enabled automobile traffic to circulate on Fire Island. Other circulation is provided by historic and modern sand paths.

▸ WILLIAM FLOYD ESTATE

The NPS completed the CLI for the William Floyd Estate in 1998 and revised the inventory in 2006.

In 1980, the William Floyd Estate, comprising a 613-acre tract, including the 34.5-acre historic core encompassing the Old Mastic House, the Floyd Family cemetery and 12 agricultural buildings was listed in the NRHP. Also included in the nomination are the museum collections associated with the Estate. Based on the 2006 CLI inventory, the New York SHPO concurred with NPS findings that the period of significance for the property ended in 1975. Two additional resources, the windmill and the cistern/wells, were determined eligible for the NRHP in 1996.

The northern boundary of the William Floyd Estate runs parallel to and between 50 and 100 yards south of Washington Avenue. The property is additionally bounded by Home Creek on the east, Narrow Bay on the south, and Lawrence Creek on the west. This property includes the Old Mastic House and its associated structures and landscape features. In general, the landscape may be characterized as a series of mowed fields and woods, (historically maintained for the hunting of wildlife, though presently not used for this purpose), man-made ponds, freshwater creeks, and extensive saltmarsh. An open vista, or view, from the Old Mastic House to the bay has been maintained.

Historically, the Estate's spatial organization and circulation were oriented to water access via Home Creek, O'Dell's Creek (now known as Lawrence Creek), and Narrow Bay. From 1724 on, as the Estate developed as an agricultural plantation, internal circulation came to include a network of dirt roads and paths. Later, as carriages, trains, and automobiles became dominant modes of transportation, the Estate's circulation patterns were reoriented from water-based access to the external system of roads and highways that were emerging on Long Island. Important character-defining features were developed on the property, such as the Great Ditch, which was constructed to keep cattle from straying into the marshes. More aesthetic elements like the ornamental lawn, the rough-cut known as the Pightle, and the Vista to Narrow Bay, were set in an area closer to the main house where they might be enjoyed as amenities. Other features associated with the plantation, such as agricultural outbuildings and a system of trails, roads, and fences, were placed as required for use of the property. Features that began as functional elements but later acquired picturesque associations, such as the Lopped Tree Line that delineated fields, are sited where their original purpose dictated their location.

Historic Structures

There are 41 structures and features listed on the Seashore's List of Classified Structures (LCS): 26 are LCS records for the William Floyd Estate and 15 are for the Fire Island Light Station. The LCS is an evaluated inventory of all historic and prehistoric structures that have historical, architectural and/or engineering significance within the parks of the National Park System. At this time, the structures associated with the Carrington Estate are not included on the LCS. These structures will be included in the next LCS update.

▸ FIRE ISLAND LIGHT STATION

The most prominent of the tract's historic structures are the Fire Island Lighthouse and the Keepers Quarters, which were completed in 1858 and 1859, respectively. These structures are built on a 15-foot-tall bluestone terrace whose materials were salvaged from the original 1825-1826 lighthouse and keeper's house, which was demolished to build the current structures on the site.

The extant Lighthouse is a 164-foot conical tower constructed of brick with a hyperbolic curved profile and a cylindrical shape near its top. The upper portion features a granite cornice and an iron-railed projecting gallery. Since 1891, the tower has been painted with four alternating black and white bands, which were kept in the same configuration when the tower was coated in reinforced concrete in 1912. The Keepers Quarters is a two-story rough-coursed granite building whose roof is a combination of a gable and a hip roof.

There are 13 historic buildings or structures within two clusters (the Light Station and the Radio Compass Station) on the Light Station tract. Core buildings and structures for the Light Station cluster include the historic Lighthouse, Keepers Quarters, Terrace, and Boat House (1939). Missing from the Light Station cluster are the coal/oil house, wharf, storehouse, and power generation plant.

The Radio Compass Station cluster is primarily comprised of the historic Lighthouse Annex Building (1906). This two-story structure with a hip roof (which has been enlarged twice) was originally built as a one-story dwelling. In addition to the Lighthouse Annex Building, there are several contributing buildings and structures including the Lighthouse Annex Garage, Tool House, Oil House, Store House, and the remains of the wireless station's Engine House and Battery House Foundation. Several historic buildings and structures within the Radio Compass Station cluster have been lost, including the engine house, radio towers, and the Chief Officer's residence. Visible concrete foundations and guy wire remnants mark the site of two large radio towers that were demolished in 1937.

The Fresnel Lens Building, an exhibit space, was constructed just west of the Lighthouse in 2010. It was designed to be evocative of the historic power-generation plant referenced above. It houses the first-order Fresnel lens that was installed at the top of the lighthouse, but eventually replaced with more modern and efficient lighting.

▸ WILLIAM FLOYD ESTATE

Chief among the William Floyd Estate's historic structures is the Old Mastic House, which is a 25-room, two-story, white wood-frame structure built around 1724 with additions in the 18th, 19th, and 20th centuries. The house is an example of Georgian and Greek Revival architecture with Colonial Revival embellishments. The house has a fieldstone foundation and clapboarded walls, with shingles on the main block's exposed east wall.

North of Old Mastic House is a cluster of historic outbuildings that were used to manage the plantation, including the Caretaker's Workshop (circa 1920), Carriage House (1884), Wood Shed (19th Century, prior to 1911), Corn Crib (18th century), Ice House, Storage Crib (18th century), Old Shop (18th century), Barn (18th century), New Barn (1950s), Pump House (circa 1880), and Incinerator (circa 1940).

Southeast of the main house, Squirrel Lane leads along the forest edge to the Floyd Family cemetery. Surrounded by a white wooden fence, the 1-½-acre Floyd Family cemetery is L-shaped and has been the burial ground for 50 Floyd family members and two family servants. Adjacent to the Family cemetery are wooden cross markers for former slaves and servants of the family.

▸ CARRINGTON ESTATE

The Carrington Estate is located off the Burma Road on federal lands to the west of the residential community of Fire Island Pines. The estate was the property of Broadway producer Frank Carrington who hosted a number of stage, screen, and literary celebrities during his period of residence and consists of two structures. The main house was constructed in 1909 by Mr. Carrington's father and was sold to the National Park Service by Mr. Carrington in 1969. The adjoining cottage was originally part of a lifesaving station and was moved near the main house in 1947 for use as a guest house. The property was listed on the National Register of Historic Places in 2014. The NPS is currently collaborating with local historic preservation and conservation interests to rehabilitate the houses for future administrative use.

Archeological Resources

▸ TERRESTRIAL RESOURCES

Terrestrial archaeological resources are documented both within and adjacent to Fire Island National Seashore on Long Island and Fire Island. In general, the archaeological resources identified reflect the cultural sequence for southern New York. However, only historical archaeological resources have been formally recorded within the Seashore (Gray & Pape 2005). The reasons for the absence of prehistoric or early Contact Period Native American sites are unclear, but they may reflect the lack of systematic survey within the Seashore.

As of 2005, 14 archaeological sites had been inventoried within the park. Numerous "salvage" archeology projects have been conducted at the Fire Island Light Station and the Floyd Estate. These projects are associated with stabilization, preservation, and construction activities related to those resources. With the exception of probable archaeological loci associated with the Floyd Estate (ASMIS Site Number FIIS00001.00), all of the previously reported sites date to the 19th and 20th centuries. The Floyd Estate, dated between 1724 and 1976, contains various elements that likely have associated archaeological components. These include the main house and its associated support buildings.

Five of the sites (ASMIS Site Numbers FIIS00003.00, FIIS00004.00, FIIS00005.00, FIIS00006.00, and FIIS00014.00) represent remnants of U.S. Coast Guard stations or an element associated with the 1826 Fire Island Lighthouse. Two commercial property remains are also inventoried: Sites FIIS00010.00 (Razed Factory) and FIIS00013.00 (Casino Site). The so-called 'Razed Factory' originally functioned as a menhaden processing plant (Gray & Pape 2005:103-104). The Casino Site was the Saltaire Casino that began operation in 1911 and was dismantled sometime in the 1950s. The remaining six sites are middens, camp, or house remnants. The camp, Camp Cheerful, operated for two decades beginning in the 1920s as a recreational facility for disabled children. The archaeological remains identified to date are limited to surface artifacts.

▸ SUBMERGED RESOURCES

The Seashore includes off-shore components on both sides of Fire Island. There has been no systematic off-shore survey for submerged archaeological resources in the Seashore (Gray & Pape 2005:109-111). Following a review of sources, the Gray & Pape (2005) report noted that from 1657 to 1985, 155 shipwrecks occurred between Fire Island Inlet and Moriches Inlet. As of their writing, none of the shipwrecks had been precisely mapped or systematically investigated.

Museum Collections

The museum collections for Fire Island National Seashore are housed at the William Floyd Estate in the Seashore's Curatorial Storage Facility (constructed in 1996). The Seashore's collections include over 25,000 historic objects, 40,000 archival objects, 24,000 archeological specimens and over 1,500 natural history specimens. Although the bulk of the collection is associated with Floyd Family, the collections include materials related to the Fire Island Light Station, the U.S. Life-Saving Service, the U.S. Coast Guard, various current and former Fire Island communities, local Long Island history, and the history and operation of the Seashore. The Curatorial Storage Facility was refurnished with new shelving in 2008. The facility, though small, is climate controlled with adequate lighting. It has limited space for conservation work and outside researchers.

OTIS PIKE FIRE ISLAND HIGH DUNE WILDERNESS

The Wilderness Act of 1964 established the National Wilderness Preservation System (NWPS), the system of all America's wilderness, to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness." The purpose of the Act was to forever preserve the wildness of certain lands by restricting land-use activities. On December 20, 1980, Congress passed Public Law 95-585, which set aside 1,380 acres of the Fire Island National Seashore as wilderness in accordance with the Wilderness Act. The Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness) is the only federally designated wilderness in the state of New York and spans approximately eight miles along the barrier island between Smith Point County Park on the east and Watch Hill on the west. This wilderness is one of only a few barrier islands and oceanfront properties along the eastern seaboard designated as federal wilderness.

The wilderness exemplifies an undisturbed stretch of barrier island ecosystem characterized by relatively large primary dunes, interdunal swales of grasses and shrubs, freshwater wetlands, and tidal marshes, but does not include Fire Island beaches. A variety of mammals, reptiles, amphibians, insects, and birds inhabit the area.

The NPS prepared a Wilderness Management Plan in 1983 that outlined management goals and objectives, potential expansion areas, wilderness use, and permitted management activities (NPS 1983). Traditional day use of the wilderness is the primary form of visitor use, though hunting and overnight primitive camping is allowed via permits issued by the Seashore.

The Seashore limits camping permits in the following ways:

- A total of 36 people are permitted to camp on the beach or in the wilderness
- No more than 12 individual s in no larger than groups of 4 in the eastern zone
- No more than 24 individuals in no larger than groups of 8 in the western zone
- Camping on the beach is permitted annually from March 15 through Labor Day

Management activities conducted by Seashore staff on the wilderness are limited to the general maintenance and upkeep of existing boardwalks and signage for regulating visitors. Such uses are consistent with wilderness stewardship policies and practices. In accordance with the management plan, restrictions have been established to protect the wilderness from new roads, unauthorized dune crossings, motorized equipment, utility installations, and other human actions that could harm the natural integrity of the wilderness.

As detailed in the Visitor Use section of this chapter, the 1,800-square-foot Wilderness Visitors Center supports the NPS's seasonal programs, year-round, ranger-led tours and programs, wilderness camping, and recreational and permitted driving. It also provides restrooms, exhibits, unique views of the wilderness, and a venue for informal interpretive contacts.

ACCESS AND CIRCULATION

Fire Island National Seashore is parallel to the south side of central Long Island. Most of the Seashore's property is on Fire Island, although the William Floyd Estate, the Seashore's headquarters, primary maintenance facility, and the Patchogue-Watch Hill passenger ferry facility are located on Long Island.

There are no public roads on Fire Island, and most vehicular use is prohibited, particularly during summer months. Some residents and visitors access Fire Island by private boat, but most use the ferry system. Passenger ferries provide access from Long Island to various destinations across Fire Island. Public ferries operate out of the towns of Bay Shore, Sayville, and Patchogue. All three ferry terminals can be accessed directly by car or indirectly by rail, bus, or taxi/shuttle. Those traveling to Fire Island by car can park at either the Robert Moses State Park or Smith Point County Park and enter the Seashore by foot. Public transit bus service is provided to Robert Moses State Park and to Smith Point County Park during the summer. A description of the summer service local bus service can be found at the Suffolk Transit website, www.sct-bus.org/index.html.

Access to the William Floyd Estate is via private automobile or by walking or bicycling from the adjacent neighborhoods.

Access by Car

The state and county parks adjacent to Fire Island National Seashore are the closest access points by vehicle. On the west end of the island, the Robert Moses Causeway provides access to the Robert Moses State Park. On the east end of the island, the William Floyd Parkway provides access to the Smith Point County Park.

The Robert Moses Causeway is a major Long Island roadway that provides connectivity between Fire Island and the western portion of Long Island, New York City, and New England via five highway connections including State Route 27A (Montauk Highway), State Route 27 (Sunrise Highway), the Southern State Parkway, Interstate 495 (LI Expressway), and the Northern State Parkway – the latter two linking via the Sagtikos State Parkway. Based on 2002 traffic count data, the roadway carries approximately 15,600 vehicles per day[11].

The Robert Moses State Park comprises the western six miles of Fire Island and abuts the Seashore's western boundary at the Fire Island Light Station area. Many visitors walk to the lighthouse from the state park's Field 5 parking lot annually. There were approximately 109,000 visitors to the Fire Island Light Station in 2012 (NPS Public Use Statistics). Robert Moses State Park provides 8,200 parking spaces among four parking lots, including the 2,460-space lot adjacent to Fire Island National Seashore. All four parking fields fill up at times during the summer months.

11 The distinction between parkways and expressways is important, as parkways allow only passenger vehicles (no trucks), while expressways permit all types of vehicles. Additionally, the causeway, defined as a roadway that is a combination of roadway across land and bridge, is also restricted by vehicle design and gross weight.

FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN

MAP 3-C
TRANSPORTATION

Circulation

- Helicopter Landing Area
- Ferry Dock
- Ferry Dock and Marina
- NPS Ferry Dock
- NPS Ferry Dock and Marina
- Public Parking
- * No Scheduled Ferry Service
- Vehicle Entry Point
  By federal permit only
- Burma Road
- NPS Trails
- Ferry Route
- Water Taxi Route
  Water Taxis service all docks, but routes can vary.

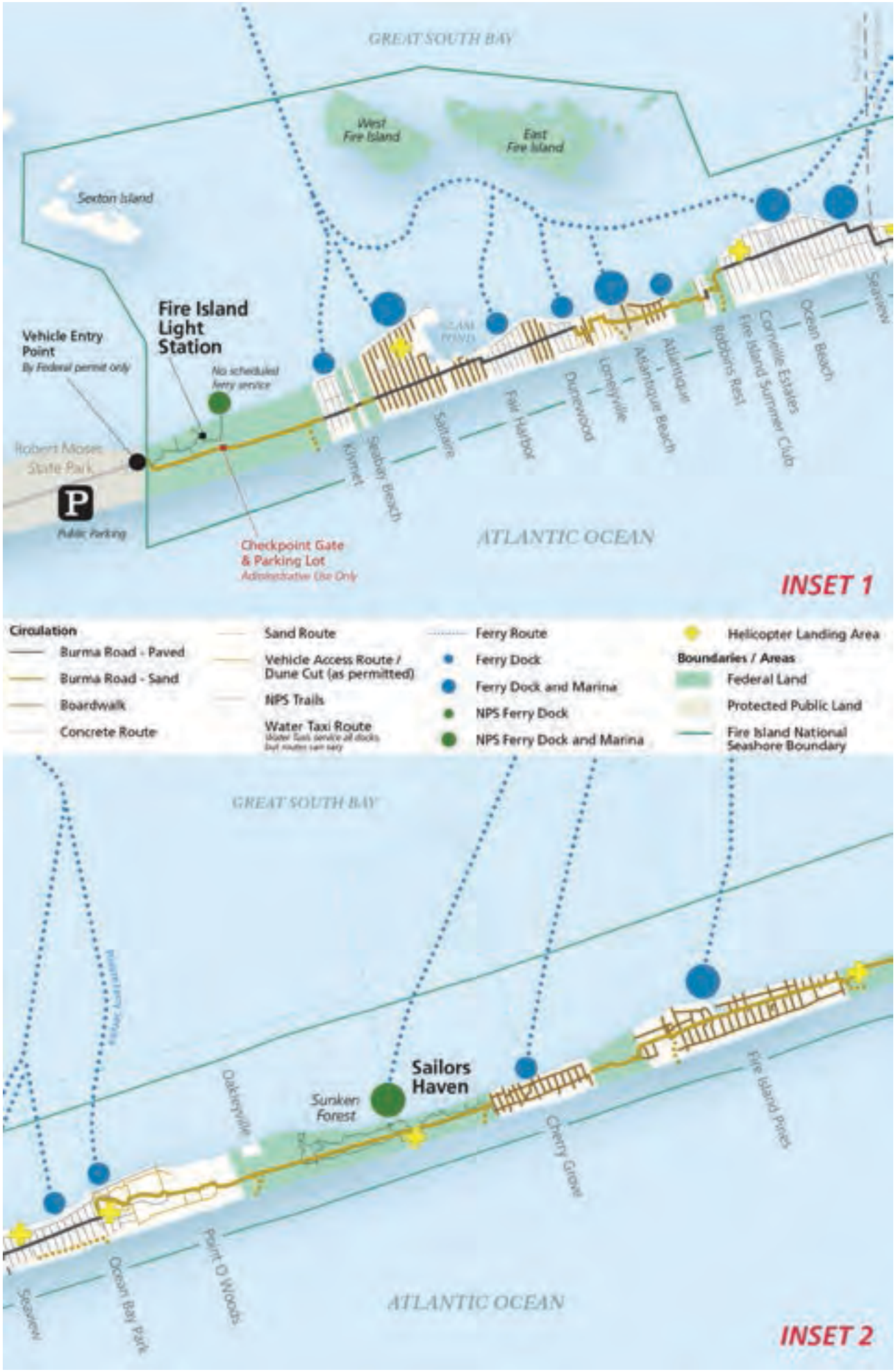
Refer to Inset Maps 1-5 for further circulation detail

Boundaries / Areas

- Fire Island National Seashore Boundary
- Federal Land
- Island Community
- Protected Public Land
- Fire Island Wilderness

North

0 1 2 Miles


GREAT SOUTH BAY
West Fire Island
East Fire Island
Sexton Island
Fire Island Light Station
Vehicle Entry Point
By Federal permit only
No scheduled ferry service
Robert Moses State Park
Public Parking
Checkpoint Gate & Parking Lot
Administrative Use Only
Kismet
Seaban Beach
Saltaire
Fair Harbor
Dunewood
Lonelyville
Atlantique
Atlantique Beach
Robbins Rest
Corneille Estates
Fire Island Summer Club
Ocean Beach
Seaview
ATLANTIC OCEAN
INSET 1
Circulation
Burma Road - Paved
Burma Road - Sand
Boardwalk
Concrete Route
Sand Route
Vehicle Access Route / Dune Cut (as permitted)
NPS Trails
Water Taxi Route
Ferry Route
Ferry Dock
Ferry Dock and Marina
NPS Ferry Dock
NPS Ferry Dock and Marina
Helicopter Landing Area
Boundaries / Areas
Federal Land
Protected Public Land
Fire Island National Seashore Boundary
GREAT SOUTH BAY
Sailors Haven
Sunken Forest
Oakleyville
Cherry Grove
Fire Island Pines
Point O Woods
Ocean Bay Park
Seaview
ATLANTIC OCEAN
INSET 2


GREAT SOUTH BAY
Watch Hill
Fire Island Wilderness
Talisman
No scheduled ferry service
Water Island
Blue Point Beach
Davis Park
ATLANTIC OCEAN
INSET 3


Circulation
Burma Road - Paved
Burma Road - Sand
Boardwalk
Concrete Route
Sand Route
Vehicle Access Route / Dune Cut (as permitted)
NPS Trails
Water Taxi Route
Ferry Route
Ferry Dock
Ferry Dock and Marina
NPS Ferry Dock
NPS Ferry Dock and Marina
Helicopter Landing Area
Boundaries / Areas
Federal Land
Protected Public Land
Fire Island National Seashore Boundary
GREAT SOUTH BAY
William Floyd Parkway
John Boyle Island
Hospital Island
Smith Point County Park
Pelican Island
Ridge Island
Old Inlet
Wilderness
Vehicle Entry Point
By Federal permit only
Fire Island Wilderness Visitor Center
Island
Fire
Bellport Beach
ATLANTIC OCEAN
INSET 4


OCEAN AVE
112
Montauk Highway
27A
WEST AVE
BAKER ST
27A
Patchogue Ferry
Terminal (NPS)
Serves Watch Hill only
Patchogue Maintenace Facility
Park Administration
LAUREL ST
CEDAR AVE
SOUTH OCEAN AVE
Davis Park
Ferry Terminal
Serves Davis Park only
PATCHOGUE BAY
INSET 5
Federal Land
Public Parking
Ferry Terminal
Ferry Route

The William Floyd Parkway (County Route 46) is a north/south principal arterial across Long Island that provides access to the William Floyd Estate and the eastern end of Fire Island. However, based on the description of various roadways (see footnote), the William Floyd Parkway is not actually a true parkway, by definition, because it is not limited in the types of vehicles that can traverse it. It is, instead, a local major arterial connecting the north of Long Island to the south, and over the bridge to Fire Island. Based on 2010 traffic count data, the roadway carries approximately 23,195 vehicles per day (NYS DOT Traffic Data Viewer). On Long Island it intersects State Route 27 and Interstate 495. It is the only roadway access to the Smith Point County Park on Fire Island, which offers one parking lot consisting of 4,000 parking spaces. Fire Island visitors can access the Seashore by walking from the Smith Point parking lot to the Fire Island Wilderness Visitor Center. Annual visitation at the Wilderness Visitor Center is approximately 12,700 per year.

The entrance to the William Floyd Estate is approximately two miles east of the William Floyd Parkway, via residential streets through the village of Mastic Beach. At the Estate, there is a paved parking lot for 30 cars and three buses. Overflow parking for special events is accommodated immediately west of the paved area, utilizing a mown field, which has a capacity of 100 to 125 vehicles. The Estate is open to the public for approximately 80 days per season and annual visitation is estimated at about 4,000. Typical peak parking is about 10 cars during the day, with a length of stay of between 1.5 and 3.5 hours.

Access by Water

Long Island ferry terminals providing access to Fire Island are located in the south shore communities of Bay Shore, Sayville and Patchogue. Each serves different sections and communities within the Seashore. Ferry service from Bay Shore serves communities on the west end of Fire Island. The Sayville ferries serve the Sailors Haven Visitor Center and adjacent Fire Island communities. The NPS Patchogue ferry terminal, located about a mile up the Patchogue River, serves Watch Hill; the Davis Park Ferry Terminal at the mouth of the Patchogue River serves the community of Davis Park. These ferries are described below. There also are two private cross-bay ferries, one serving Point O' Woods from the Bay Shore ferry terminal and the other serving Bellport Beach originating from the village of Bellport. These ferries are restricted to residents of those communities.

- **Fire Island Ferries,** located on the southern end of Maple Avenue in Bay Shore, owns and operates the ferry service at this location. Fire Island Ferries provides service to eight different locations on Fire Island: Kismet, Saltaire, Fair Harbor, Atlantique, Dunewood, Ocean Beach, Seaview, and Ocean Bay Park. The Fair Harbor and Ocean Beach routes operate all year, depending on the weather. All other routes begin service in May and run through October or November, if weather conditions permit. The Fire Island Ferries fleet consists of nine boats with capacities between 150 and 395 passengers.
- **Sayville Ferry Service,** located on River Road, between Brown River Road and Terry Street in Sayville, owns and operates the ferry service at this location. Sayville Ferry provides service to four different locations on Fire Island: Sailors Haven, Cherry Grove, Fire Island Pines, and Water Island. The Cherry Grove and Fire Island Pines destinations operate all year but limit service in the winter to weekends. All other routes begin service in May and run through October or November as weather conditions permit. The Sayville Ferry fleet includes four vessels with capacities ranging from 105 to 412 passengers.
- **The Patchogue Ferry terminal,** owned by NPS and located on West Avenue across from Amity Street, is operated by a concessions contract with the Davis Park Ferry Company. As described above, Davis Park Ferry Company provides service to two locations on Fire Island from two locations in Patchogue. Both routes begin operation in May and run through November. The Davis Park Ferry fleet consists of four boats with capacities between 49 and 300 passengers.

The three public passenger ferry operators carry approximately 1.6 million passengers to Fire Island annually (National Ferry Data Base 2006). Fire Island Ferries carries 980,000 passengers, over 60 percent of the total ferry ridership to Fire Island. The Sayville Ferry Service carries 470,000 passengers annually, about 30 percent of the ridership to the island. The Davis Park Ferry carries approximately 150,000 passengers

annually. Most of the public passenger ferry ridership is to the communities within the boundaries of Fire Island National Seashore. Two of the ferry routes operate between the mainland and the federally managed sections of Fire Island. The ferry service between Sayville and Sailors Haven carries between 50,000 to 78,000 passengers annually. The annual ridership on the ferry service between Patchogue and Watch Hill is 18,000 to 20,000.

There also are four ferry landings and 10-12 public marinas operated by local communities. Two of the public marinas are NPS facilities operated by Fire Island Concessions: the Sailors Haven marina has 45 slips and the Watch Hill marina has 188 slips. A public marina at Atlantique Beach is operated by the Town of Islip and primarily serves its residents. The Town of Brookhaven operates a marina in Davis Park that serves both residents and non-residents.

Transient slips are available at the Seashore marinas for a fee. During the summer months, all boat slips are typically occupied. Dinghies and similar small boats are allowed on shore within the Seashore. Larger boats can moor off shore.

Lateral water transportation is provided by Fire Island Water Taxi, operated by Fire Island Ferries. The service operates on demand from Memorial Day through the weekend after Labor Day between the Fire Island Lighthouse and the Watch Hill Visitors Center, with service to all communities with public docks.

Public Transportation

It should be noted that any of the public transportation routes and frequencies are subject to change by the relevant agency and must be verified by potential users prior to any visit to Fire Island.

▸ REGIONAL AIRPORTS

Long Island is served by commercial airline service at Long Island MacArthur Airport in Islip. More extensive domestic and international air service is available at LaGuardia International Airport and John F. Kennedy International Airport in New York City. All of these airports are accessible from Fire Island via the vehicle access routes described above or via public transportation.

▸ RAIL ACCESS

The towns of Bay Shore, Sayville, and Patchogue on Long Island are served directly by the Metropolitan Transit Authority (MTA) Long Island Rail Road (LIRR). The most convenient connection between the rail line and passenger ferries to Fire Island is in Patchogue, where the train station and ferry terminal are two blocks apart. The train stations in Bay Shore and Sayville are much farther away, and require either a bus transfer, taxi, or private vehicle to get to the ferry terminal. Trains from the major transit hubs of the LIRR, Penn Station in Manhattan and Flatbush Avenue/Brooklyn Station in Brooklyn, converge at Jamaica Station, which serves as the major railroad hub to access Fire Island. Passengers traveling east must change trains either at Jamaica or at Babylon, and depending on their final destinations, must take either the Babylon Branch of the LIRR or the Montauk Branch, both of which extend service along the southern shore of Long Island through the towns of Bay Shore, Sayville, and Patchogue. A survey conducted of ferry passengers in 2001 indicated that one quarter arrived via the LIRR. Almost half of those departing from Patchogue arrived via the LIRR (U.S. Department of Transportation, 2001).

▸ LOCAL BUS SERVICE

Suffolk County Transit (SCT) provides year-round local bus access for the towns of Bay Shore, Sayville, and Patchogue. SCT operates six local routes within the Bay Shore area, three routes in Sayville, and eight routes within the Patchogue area. Many of these routes provide stops within walking distance of a ferry terminal. SCT operates one bus route and one route extension that run during the summer only and provide access to the Robert Moses State Park and Smith Point County Park.

Transportation on Fire Island

There is very limited vehicle travel on Fire Island, as there are no public roads. A set of rules governing the vehicular transportation on Fire Island, the Final Consensus Agreement, was established in 2003 by collaboration among various stakeholders. The following user groups have vehicle permits:

- Public Utilities
- Essential Service Providers
- Contractors
- Emergency Services
- Residents
- Official and Municipal Agencies

Vehicular access, even with a permit, is restricted during the busy summer months. There are also some temporary off-road recreational driving permits issued during fall fishing and hunting seasons (See the visitor use section of this chapter, below).

No section of the Seashore, other than the Wilderness, is more than a mile from one of the Fire Island communities. The primary means of traveling within on Fire Island is on foot over a network of boardwalks, pathways, and along the oceanfront beach. Bicycling within Fire Island National Seashore is allowed, although opportunities are limited since bicycles are not allowed on NPS boardwalks, in the wilderness, at marinas, and in some of the communities.

The Fire Island Water Taxi service provides lateral connections among the Fire Island communities and some of the Seashore facilities using small, fast passenger ferries. The taxi service operates from Kismet on the west end of the Fire Island to Watch Hill.

Emergency Access

There are nine fire departments serving the 17 communities within the boundaries of the Seashore on Fire Island. Six of the communities have medical clinics. However, those clinics provide limited services and are not adequate for most medical emergencies. Emergency medical services (EMS) within the Seashore are provided as appropriate by NPS rangers, the Suffolk County Police Department (SCPD) personnel, and the fire departments in Saltaire and Ocean Beach. The Seashore has an agreement with Mastic Beach for emergency response at the William Floyd Estate and on the east end of Fire Island.

Almost all medical transports are by boat or by helicopter. The SCPD Marine Bureau and SCPD Aviation Bureau provide medical transport for incidents within the Seashore; except for the most severe emergencies, transports take place via designated landing zones. Baseball fields are used in the communities of Saltaire, Ocean Beach, Seaview and Point O' Woods, and there is a helipad in the community of Davis Park. There are NPS helipads at Sailors Haven, east of Fire Island Pines, and at Watch Hill. An additional helipad is located at Great Gun Beach in Smith Point County Park.

During the off season, emergency access by police, medical responders, and public utilities on Fire Island is made possible via the Robert Moses Causeway and the William Floyd Parkway bridges on either side of the Seashore. During the summer this is generally not practical due to the heavy visitation and vehicle traffic. The public utility providers store vehicles in several of the communities to facilitate timely responses to incidents.

Freight

Several companies accommodate the varying freight service needs for Fire Island residents and services. The three passenger ferry companies discussed previously also operate separate freight boats. Fire Island Ferries has three freight boats that run one daily trip to eight communities on Fire Island on weekdays, year-round. Saturday service is also available from mid-April through mid-October. Four of the communities served by Fire Island Ferries provide freight storage facilities. Sayville Ferry operates a freight boat with up to 10 trips per week from April through November. Davis Park Ferry operates one freight boat with limited service. The majority of cargo services in Davis Park are provided by private operators.

In addition to the passenger ferry operators, five freight-specific companies serve Fire Island, and the Town of Brookhaven also has a ferry facility that serves Brookhaven communities.

Schools

The Fire Island School District transports approximately 41 students and 9 teachers along the Island and to several locations on Long Island during the school year[12]. Seven school buses, all equipped with four-wheel drive to traverse both paved and unpaved roadways, travel a total of 27 routes (U.S. Department of Transportation, 2011).

12 http://schools.newsday.com/long-island/districts/fire-island/woodhull-elementary-school/. Accessed May 8, 2013.

VISITOR USE

The Long Island beaches always have been a popular destination. The secluded nature of Fire Island has made it an especially popular location for recreation and resort development. Since the Fire Island National Seashore was established in 1964, the NPS and its partners have worked to provide for a high-quality visitor experience and to maintain and enhance the recreational opportunities that have always been a part of Fire Island.

Visitation

The porous nature of the Seashore boundary, with virtually limitless points of entry, makes it difficult to accurately measure visitation. In addition to NPS-owned lands, the Seashore's boundary encompasses a county park, 17 private residential communities, and nearly 17,000 acres of bay and ocean waters. Current visitation tracking does not fully account for visitor use in these areas.

Fire Island National Seashore's visitation counts are derived from visitation observed at a number of Seashore facilities. As noted above, visitation at other points of entry within the Seashore boundary do not become part of the official NPS visitation tally. Visitation to Fire Island National Seashore is relatively stable. Throughout most of the Seashore's history, annual visitation has hovered around 500,000 visitors per year with some notable highs and lows. The year 2004 was the Seashore's busiest, with a visitation count of approximately 820,000, while in the year 1995, it received the lowest number of visitors with a visitation count of about 350,000 (NPS 2012). In 2003, the Suffolk County Budget Review Office generated a study of the economic value of the county's beaches and estimated that total visitation within the boundaries of Fire Island National Seashore reached approximately 2.2 million visitors per year (Suffolk County, 2003).

In 2008, the NPS conducted a visitor-use study at the park. The study included responses from 636 visitors who completed surveys distributed exclusively at NPS facilities in July 2008. Relevant information that emerged from this study includes:

- United States visitors comprised 97 percent of total visitors, from New York (84 percent) and 37 other states and Puerto Rico. International visitors represented 3 percent of total visitation, with 34 percent from Canada, 11 percent from Australia, and the balance from 12 other countries.
- Approximately 54 percent of visitors were ages 36-65 years, 7 percent were 66 years or older, and 18 percent were ages 15 years or younger. Six percent of visitor groups reported physical conditions that made it difficult to access or participate in park services or activities.
- Approximately 43 percent of visitors had visited the park once in the past 12 months, while 34 percent had visited five or more times.
- Prior to this visit, 80 percent of visitor groups were aware that Fire Island National Seashore is a unit of the national park system and 67 percent were aware of the difference between the Seashore and other public beaches on the barrier island.
- Prior to this visit, most visitor groups obtained information about Fire Island National Seashore through previous visits (72 percent) and friends/relatives/word of mouth (48 percent). Approximately

90 percent of visitor groups obtained the information they needed, while 9 percent did not obtain any information about the Seashore prior to their visit.

- Local residents accounted for 88 percent of visitor groups (within 45 miles of any park entry point). Visiting Fire Island National Seashore was the primary reason that brought 59 percent of the nonresident visitor groups to the park area, while 19 percent came to visit friends and relatives in the area.
- Of visitor groups that spent less than 24 hours visiting the park, 42 percent spent 5 hours or more at the park. For those who visited for more than 24 hours, 38 percent spent 4 days or more at the park. The average length of stay, including those who spent less than 24 hours and those who spent more, was 27 hours.
- Of the sites operated by the NPS, the beaches and the Fire Island Lighthouse were the most popular, attracting 60 percent and 41 percent, respectively, of visitor groups. The other sites were visited by 3 percent to 25 percent of visitor groups. Among sites not operated by the NPS, Robert Moses State Park was the most popular, attracting 50 percent of all visitor groups.
- Of the activities in which visitors engaged on past trips to Fire Island National Seashore, beach activities were the most common (90 percent), followed by spending time with family and friends (80 percent). The most common activities on the current trip were also beach activities (76 percent) and spending time with family and friends (68 percent).
- Most visitor groups (89 percent) rated the overall quality of services, facilities, and recreational opportunities at Fire Island National Seashore as "very good" or "good." One percent of visitor groups rated the overall quality as "very poor" or "poor" (NPS 2008e).

Among other things, the findings from this study illustrate the importance of Fire Island National Seashore to the Greater New York region. At the time of the Seashore's last GMP, only 7 percent of visitors were from outside of the state of New York (NPS 1977). Since then, this percentage has increased to 16 percent.

Patterns of Use

Due to the dynamic nature of barrier islands and the fact that the Seashore is near the largest population center in the country, visitation often changes dramatically from year to year. In general, visitation patterns reflect those of a local park rather than a national park, with day and weekend trips dominating visitation. The large decrease in visitation, between 1994 and 1996, is due primarily to major storm damage to beaches and other park property during this time period (NPS 2007i). Since the majority of visits are day or weekend beach use, weather also has a significant effect on visitation, as evidenced by a decrease in 2003 due to excessive rain.

3-1. VISITATION TRENDS—
Fire Island National Seashore, 2002–2012

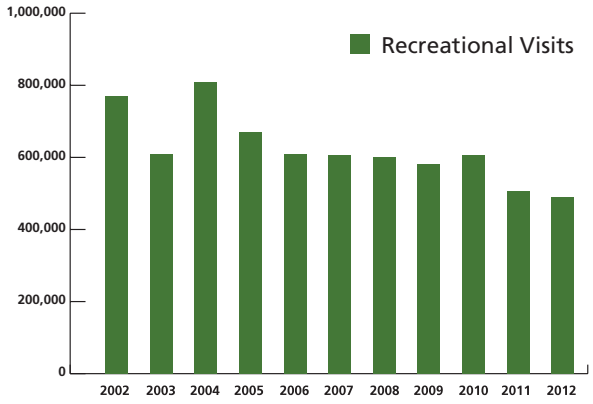


Chart 3-1: Visitation Trends for Fire Island National Seashore—including the William Floyd Estate. Visitation to the Seashore was at its highest in 2004. *Source: NPS Public Use Statistics*

3-2. VISITATION TRENDS—
William Floyd Estate, 2002–2012

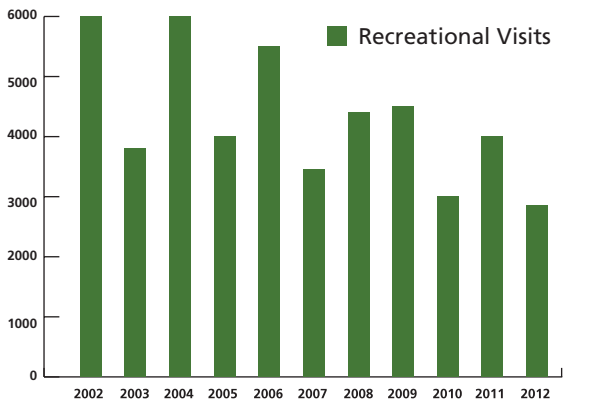


Chart 3-2: Visitation Trends for William Floyd Estate
Source: NPS Public Use Statistics; Staff, FIIS.

The William Floyd Estate's Old Mastic House is open to the public on a seasonal basis. Visits to the Old Mastic House and participation in programs and special events are the basis for visitation statistics to the William Floyd Estate; visitors who come to walk the grounds are less likely to be counted. During the late 1990s visitation hovered between 6,000 and 7,000 visitors per year. Since 1999, visitation figures have become far less stable and have experienced a steady decline, with visitation since 2009 ranging from 2,700 to 4,500 visitors (NPS 2012). Formal school programs were offered at the William Floyd Estate beginning in the late 1990s, at which time as many as 230 school programs per year were being provided. By 2006 the number of school programs had declined roughly by half, and demand for such programming had become less consistent. The Estate has not hosted formal school groups since 2007. The decline in demand for school programming is partially attributable to rising concerns about exposure to tick-borne diseases on the part of local school districts. It has also resulted from a reduction in school programming being offered at the Floyd Estate due to limitations in funding and staff.

Information and Orientation

According to the 2008 Visitor Study, over 90 percent of Fire Island visitors sought information about the Seashore prior to their visit. Visitors planning a trip to the Seashore can turn to several sources of information. According to the 2008 Visitor Survey, the majority of visitors relied on information from previous visits to plan their recent trip to the Seashore (72 percent). Nearly half of the Seashore's visitors also relied on word of mouth from friends and family for receiving information for their visit (48 percent). Seashore partners and special interest groups also serve as information sources for visitors (less than 4 percent). These groups include the Appalachian Mountain Club, Fire Island Lighthouse Preservation Society, Friends of Fire Island National Seashore, 4H/ Girl Scouts, Adirondack Mountain Club Mohican Chapter, Amityville Historical Society Tour, and Nassau Hiking and Outdoor Club. Other groups that provided information (less than 3 percent) to visitors included tour groups, local residents, information/visitor centers, and park rangers.

The 2008 Visitor Survey also asked visitors what information was not available to them prior to their trip. The responses, listed below, highlight visitors' reliance on informal sources of information rather than NPS staff or information centers. The types of information visitors were unable to find included:

- Activities
- Areas available to visit
- Assistance for docking
- Directions
- Directions to ferry
- Dock space fee
- Facilities
- Facilities at each ferry stop
- Fees
- Ferry address
- Flora and fauna identification
- GPS system address
- Location of nude beaches
- Maps
- Walking tour of Sunken Forest
- What park has to offer
- What to expect (NPS 2008e)

Much of the information identified as being missing is actually provided by the NPS through the following sources.

Website and Social Media.
The front page of the Seashore's web site (www.nps.gov/fiis) provides a listing of upcoming special events and seasonal programs. It also provides phone numbers for general information and specific park offices as well as directions to specific locations within the Seashore and fees or permits that may be required for certain activities. The Seashore maintains a strong social media presence on Facebook and Twitter, which are both used to advertise park programs, provide operational information, and share educational information about park resources and significance.

Summer Program Guide.
At the beginning of each summer season, the NPS produces the Summer Program Guide. This guide is available online and at locations throughout the Seashore and provides daily schedules for park facilities and programs. It also highlights special events that will occur throughout the visitor season, such as the Fire Island Trek. The Summer Program Guide is supplemented by regular park e-newsletters that provide updates on park programs and visitor activities. During shoulder seasons and the winter, monthly program and activity schedules are available on the Seashore's website and as printed bulletins at open Seashore visitor centers and area libraries.

There is no central entrance or orientation point within Fire Island National Seashore; therefore, it is important to the NPS that the information sources described above be readily available to the public. Once visitors reach the Seashore, orientation is provided by signs and maps at key locations, as well as by NPS staff. Visitors arriving by ferry at NPS facilities encounter staffed visitor centers, outdoor bulletin boards, and interpretive waysides near the dock that include park maps and other information. Those arriving by ferry at Fire Island's residential communities are currently offered little information related to the Seashore. Visitors traveling to Fire Island by private vehicle may enter at either end of the National Seashore. Traveling from the west, visitors can stop at the Fire Island Light House Visitor Center to obtain maps and other information relevant to their visit. For visitors traveling from the east, this information is provided at the Wilderness Visitor Center. Visitor orientation at the William Floyd Estate is provided by signage, a visitor kiosk, and in the reception room of the Old Mastic House, where visitors are greeted by rangers and volunteers.

Interpretation and Education

The 1994 *Interpretive Prospectus* (NPS 1994) serves as the basis for the Seashore's interpretive and educational programs. Although the document addresses all of the visitor facilities within the Seashore, not all of the plans recommended in the prospectus have been carried out.

Many of the NPS outreach, education, and public relations functions are housed at the Seashore's administrative headquarters on Long Island. The warehouse building at the Patchogue Maintenance Facility (PMF) houses several Seashore offices including interpretive staff offices, the park library, and the resource management laboratory. These locations are not open to the public, but provide educational opportunities for researchers and visitors upon request. The new Patchogue Ferry Terminal was constructed in 2010 to replace the existing terminal and includes additional exhibit areas and a multi-purpose room that can accommodate visitors and Seashore staff.

The William Floyd Estate is the other interpretive and educational facility on Long Island. From late-May through mid-November, visitors may take guided tours of the Old Mastic House. The grounds are open year-round, enabling visitors to explore the 613-acre landscape; NPS interpreters and volunteers offer thematically relevant programming and nature walks as staffing and conditions permit. The Old Mastic House reflects a continuum of historical use over more than two centuries that is manifest in its structural modifications and multi-period furnishings. The current interpretive focus of the property is on the continuum of use, emphasizing Floyd and his descendants and the historical evolution of the property as it reflects important national and regional trends. To supplement this story, the NPS recently initiated tours of the Seashore's curatorial storage building located at the William Floyd Estate. The collections include items related to the Floyd family as well as the general history of the region. A wide range of programming is offered on the Estate throughout the year.

On Fire Island, educational and interpretive activities occur at several locations. Seashore-wide outreach programs are aimed toward informing the surrounding communities about the resources at Fire Island and finding ways to provide focused programs to local schools

and other interest groups. To meet this goal, Seashore staff regularly coordinates with local teachers to identify roles the Seashore can play in different curricula and plan field trips for classes. Educator workshops are conducted annually. Several curriculum-based activities on the topic of shoreline dynamics were developed for use by middle- and high-school educators taking self-guided classes to the Seashore, and equipment for the activities is available at park sites for their use. A traveling trunk is available for loan by schools as orientation preparation for an on-site class visit.

Thirty-three wayside exhibits are located throughout Fire Island National Seashore to interpret features that are visible from the given location or to provide general orientation within the Seashore. The waysides provide text, photographs, illustrations, and maps that relate to the history of the location on Fire Island. Several waysides highlight resource-protection issues and efforts. A variety of park brochures and publications are available at visitor contact stations including rack cards on safety, ticks, and mosquitoes; six different topical junior-ranger booklets; site bulletins including the "The Storm Beach," "The Science of Shifting Sands;" bird checklists, the Seashore's "unigrid" or park brochure, and partner publications.

One of the primary destinations for interpretive and educational programming on Fire Island is the lighthouse. Owned by NPS and operated by the Fire Island Lighthouse Preservation Society (FILPS) through a cooperative agreement with the NPS, the lighthouse provides specialized educational programs to over 7,000 local elementary school children each year. The group provides interpretive materials and displays on the main floor. Small tours of the tower also are available. With the help of its volunteer group and the NPS, FILPS provides educational programs related to the history of the lighthouse, the history of regional maritime activities, as well as the overall role of lighthouses along the Atlantic Ocean.

Another educational opportunity is provided at Sailors Haven. The Sunken Forest, adjacent to Sailors Haven, is a popular attraction for school groups and many of the Seashore's recreational visitors. Interpretive signs within the Sunken Forest enable visitors to take self-guided tours along the 6,100-foot long boardwalk that winds through the site. Within the developed portion of Sailors Haven, a small pre-existing house has been adapted to serve as a visitor contact station and program area. It contains a number of locally prepared exhibits, aquaria, and an information desk. Programming at Sailors Haven includes school programming during the spring and fall; and summer programming for youth and family audiences highlighting the significance of the Sunken Forest, marine life of the Great South Bay, shoreline dynamics, endangered species, and other topics relating to the site.

Watch Hill is another location on Fire Island with facilities for interpretation and education. The 3,500-foot nature trail/boardwalk allows for self-guided and ranger-guided tours through a salt marsh. These tours are supported by educational materials obtained at one of the two visitor contact stations at Watch Hill. The first contact station is a visitor center located at the Watch Hill dock. The small space provides for visitor contact with NPS rangers and a series of formal and somewhat dated, exhibits. The exhibits interpret the salt marsh habitat, the ocean beach, Great South Bay, and other natural resources and feature several aquaria and touch tables. The other visitor contact station, the dune station, is located along the boardwalk near the crossover to the beach. It is a small structure that can be used for interpretive programming.

Programming at Watch Hill is geared for children and family audiences and highlights significant Seashore topics such as endangered species, bay-to-beach habitats, shoreline dynamics, marine life in the Great South Bay, and salt marsh issues and resources. Watch Hill is the western entry to the Fire Island Wilderness, and the Visitor Center provides seasonal support and check-in for the backcountry camping program. The site hosts the ranger-guided canoe program into the marshes of Watch Hill.

The Wilderness Visitor Center is open year-round for beach access and as the eastern entry to the Fire Island Wilderness. The facility contains a staffed information desk, sales space, rest rooms, displays, and a gathering space on the second floor. In-house exhibits focus on the natural history and maritime history of the Seashore and feature several aquaria and a touch table. Year-round programming geared to adults, families, and children is offered on a variety of topics such as wilderness value, barrier island habitats, beachcombing, winter bird-watching and botany, endangered species, maritime music, astronomy, and other related topics. Guided and self-guided education programming at this site focus on the topics of beach ecology and shoreline dynamics. The visitor center provides staffing support for the Seashore's off-road driving, hunting, and backcountry camping programs.

Recreational Activities (Visitor Use Regulations)

There are a wide variety of recreational activities available at Fire Island National Seashore. Some of these activities are regulated by the NPS to provide equal opportunities and a safe environment for all visitors, while protecting Fire Island's vast resources. Some activities, such as kite flying, camping, and picnicking, are restricted to certain areas and times of year within the Seashore. Other activities, like back-country camping and private events, require NPS permits. Regulated or recently restricted activities at Fire Island National Seashore include clothing-optional recreation, recreational driving, and fishing and fowling. The regulations or restrictions that guide these activities are described below.

▸ CLOTHING-OPTIONAL RECREATION

New York State law prohibits public nudity. On Fire Island, clothing-optional use of beaches is a long-standing activity that predates Congressional establishment of Fire Island National Seashore. However, in response to recent events and ongoing public use conflicts, in February 2013 the National Park Service announced its decision to enforce New York State law with regard to public nudity in high-visitor-use areas on federal lands.

▸ OFF-ROAD OR RECREATIONAL DRIVING

The Seashore regulates recreational driving. Off-road driving on the beach is a popular recreational activity, which is limited to the fall and early winter months, when visitation is low and there are no threats to nesting or breeding wildlife. Permits must be obtained for all off-road driving on Fire Island. Unpermitted vehicles are restricted to roads and parking lots near the bridges connecting Fire Island to Long Island. The only zone where recreational driving is allowed is the eastern zone between the Wilderness Visitor Center and Long Cove.

In addition to the permits, the NPS has established rules to protect Fire Island resources while allowing access to recreational opportunities. To protect the dunes that provide barriers to the ocean's waves and storms and habitat important for endangered species and other coastal wildlife, vehicles are not permitted within 20 feet seaward of the toe of dunes or visible beach grass at any time of year. If 20 feet of beach is not available from the toe of the dune/beach grass to the water's edge due to tides and/or wave run-up, then motor vehicle travel through that portion of the island is prohibited. Along with protecting the beach environment, driving rules also protect the special-status species on the island. To ensure adequate protection of this resource, beach driving is closely monitored through the vehicle checkpoint cuts as well as on the beach.

▸ FISHING AND HUNTING

Along with the driving restrictions, fishing and fowling regulations protect the natural, scenic, and recreational resources in Fire Island National Seashore. Hunters must obtain a New York State hunting license as well as Special Use Permit from NPS to hunt within the Seashore. Areas where hunting is permitted include the following.

1. **East End Hunting Area:** This area is adjacent to the Fire Island Wilderness. A recreational vehicle driving permit may be used to access the beach on the Atlantic Ocean side of the Wilderness from September 15 through December 31, but access to the bay side of Fire Island is by foot or shallow-draft vessel only. Waterfowl hunting is permitted only from Hayhole Point (west of the Wilderness Visitor Center and boardwalk) to Long Cove (east of Watch Hill). No hunting is allowed from the small bay islands north of Fire Island in this area. A portion of the Pattersquash Gun Club's hunting rights are within the Seashore's boundary.
2. **West End Hunting Area:** This area is restricted to shoreline waterfowl hunting from East Fire Island, West Fire Island, and Sexton Island.

Surf and jetty fishing is the most common form of fishing on the ocean side of Fire Island. Although a recreational marine fishing license is not required by the State of New York to surf fish or fish in the Great South Bay, NYS requires that anglers register with the no-fee recreational marine fishing registry and be aware of fishing seasons and catch limits established by the state. Anglers are encouraged to voluntarily report their catch in the state's on-line angler logbook. No fishing is allowed within NPS maintained marinas or designated lifeguard beach swimming areas. In addition, no commercial fishing is permitted within the Seashore.

Public Facilities and Services

Fire Island National Seashore is composed of public and private lands, including federal, town, and county parklands, and private communities. Interspersed between NPS lands are 17 private communities that were established before the creation of the Seashore.

Today these communities include 4,200 homes. Some of these communities have provisions for guests and tourists, while others are strictly residential. These communities are discussed in detail in the Socioeconomic Environment section of the EIS.

Infrastructure on NPS lands includes 12 miles of boardwalks, 26 campsites, three visitor centers, 67 buildings, 23 housing units, 233 overnight boat slips located at two marinas, and a public dock for loading/unloading at Talisman. Seashore infrastructure also includes a ferry terminal in Patchogue. The primary locations managed by the NPS at Fire Island National Seashore are described below.

William Floyd Estate

The William Floyd Estate, located in the Village of Mastic Beach, on the south shore of Long Island, is the Seashore's primary resource on Long Island. The Estate is a 613-acre tract of land donated to the NPS by the Floyd family in 1976. It includes the main house, with furnishings, which is a 25-room, two-story, white frame structure built around 1724 with 18th-, 19th- and 20th-century additions. The house is an example of Georgian and Greek Revival architecture with Colonial Revival embellishments. The Estate also includes 12 historic outbuildings, a family cemetery, visitor parking, walking trails, fields, forests, ponds, and salt marshes. The NPS maintains a curatorial storage facility on the property, housing natural and cultural resources and artifacts not presently on display elsewhere at the Seashore. The Estate has been maintained in relatively the same condition as when the NPS was given the property.

Wilderness Visitor Center

The Wilderness Visitor Center is located at the eastern boundary of the wilderness, adjacent to Smith Point County Park. The 1,800-square foot visitor center supports NPS seasonal programs, ranger-led tours and programs, wilderness camping, and recreational and permitted driving. It also provides restrooms, exhibits, and unique views of the wilderness. The structure has been maintained in good condition; however, many of the displays were produced in-house and are out of date. The Smith Point West Nature Trail extends from the visitor center onto the landscape, where visitors can experience self-guided or ranger-led walks. When it was first constructed, the boardwalk was over a mile long. Since then, storm damage and concerns about the wilderness character have led the NPS to reduce its footprint.

Fire Island Lighthouse

The Fire Island Lighthouse, built in 1858, is located on the far western end of the Fire Island National Seashore. The lighthouse was acquired by the NPS in 1978 to preserve and interpret the maritime history of Fire Island, including the U.S. Lifesaving Service and the U.S. Coast Guard. It was placed on the National Register of Historic Places (NRHP) in 1981. The Lighthouse is currently run by the Fire Island Lighthouse Preservation Society (FILPS). On-site personnel open and close the 2,664-square foot lighthouse visitor center and tower, conduct tower tours, provide information and programs to visitors as well as organized group tours, and provide for the daily maintenance activities and minor repairs for the preservation of the national historic site. Since the NPS took over the lighthouse, extensive work has been done to rehabilitate and preserve the lighthouse resources. Working cooperatively the NPS and FILPS have undertaken improvements including maintaining an operating light in the tower, repairing portions of the building, and reacquiring the original Fresnel lens and making it available for display and educational purposes in an exhibit building that was constructed over the footprint of the original generator building. In 2012, the Fire Island Light Station had approximately 109,000 visitors, primarily pedestrians from neighboring Robert Moses State Park and visitors arriving via occasional ferry service or water taxi.

Sailors Haven

Sailors Haven encompasses restrooms, a small visitor center, and lifeguarded beach administered by the NPS and a 45-slip bayside marina and snack bar operated by concessioners. The Sunken Forest, accessed via a boardwalk from Sailors Haven, is an old-growth maritime forest consisting predominantly of American holly and sassafras. The forest is defined by its location behind the secondary dune system that protects it from Atlantic Ocean storms and salt spray. Materials provided at the visitor center, along with signs located throughout the forest, provide for a self-guided tour through some of the Fire Island's rarest environs. Ferry service to Sailors Haven is provided by the Sayville Ferry Company from the hamlet of Sayville. Although the visitor center's appearance and displays are outdated, the structures are in good condition.

Watch Hill

Watch Hill includes a visitor center, nature trail, campground and beach area. A 188-slip bayside marina,

FIRE ISLAND NATIONAL SEASHORE GENERAL MANAGEMENT PLAN

MAP 3-D VISITOR FACILITIES - EXISTING CONDITIONS

Recreation
- Camping
- Self-Guided Hiking Trails
- Lifeguarded Swim Area
- Bathouse/Changing Room
- Picnic Area

Information / Education
- Visitor- Orientation Facility
- Restroom
- Museum

Concessioner Services
- Store
- Restaurant / Snack Bar
- Bar

Transportation / Boating
- Ferry Terminal
- Marina/Public Boat Dock
- Parking

- Federal Land
- Fire Island Wilderness
- Island Community
- Protected Public Land
- Fire Island National Seashore Boundary
- Ferry Route
- Hiking Trail / Walking Route

restaurant, snack bar, and store are operated and maintained by a concessioner. The visitor center hosts a cooperating association bookstore and marine aquaria as well as professionally designed and fabricated exhibits that are outdated. The site is located at the western boundary of the Fire Island Wilderness and provides access to the wilderness for hikers and backcountry campers. The Watch Hill nature trail is used for self-guided or ranger-led walks. Ferry service to Watch Hill is based out of the NPS Patchogue Ferry Terminal in the village of Patchogue, near the Seashore headquarters.

Talisman

Talisman is located at the approximate center of the barrier island and extends from the eastern boundary of Fire Island Pines eastward to the western boundary of the small enclave of houses informally known as Spatangaville. Access to Talisman is by private boat, and visitors moor offshore to access the area. There is no regular ferry service. Historically, the marina and lifeguarded beach area was known as Barrett Beach. It was donated to the NPS in 1997 by the Town of Islip and subsequently renovated by the NPS. It now contains a dock for ferry landings and a boat landing for visitors to offload their beach gear. Additionally, there are restrooms and showers. The Talisman area is regularly maintained by the NPS.

SOCIOECONOMIC ENVIRONMENT

Long Island consists of four counties: Queens County, Kings County, Nassau County, and Suffolk County. For the purpose of this analysis, only Nassau and Suffolk Counties will be considered, as Queens and Kings Counties are considered part of New York City.

Nassau County

▸ POPULATION TRENDS

In 2010, Nassau County had the sixth largest county population in New York State, with an estimated 1,339,332 residents, and a population density of approximately 4,704 people per square-mile (U.S. Census 2010a, StatsIndiana 2012). Between 1990 and 2011 the county had a growth rate of 4.4 percent (StatsIndiana 2012). Approximately 98 percent of the population reported only one race, with 73 percent reporting White and approximately 11 percent reporting African-American. Approximately 15 percent of the County's population identified themselves as Hispanic (any race) in 2010 (U.S. Census Bureau 2010a).

In 2010, approximately 79 percent of the people living in Nassau County were native to the United States and 72 percent were born in New York State (U.S. Census Bureau 2010b). Twenty-seven percent of Nassau County residents 5 years or older in 2010 spoke a language other than English at home. Of those residents, 42 percent spoke Spanish and 58 percent spoke some other language. Additionally, 38 percent of those that spoke a language other than English at home reported that they did not speak English "very well" (U.S. Census Bureau 2010b).

Many of the residents of Nassau County are highly educated. Based on 2010 Census data, nearly 90 percent of Nassau County residents 25 years and over had at least graduated from high school, and over 40 percent had a bachelor's degree or higher (18 percent had completed a graduate or professional degree, compared to 14 percent statewide). This compares favorably to the education rates for New York State as a whole (84 percent of the state population has at least a high school degree and 32 percent have a bachelor's degree or higher) (U.S. Census Bureau 2010b). Levels of education in 2010 were consistent with those reported in the 2000 Census (approximately 90 percent of residents had at least a high school degree, and 40 percent had a bachelor's degree or higher) (U.S. Census Bureau 2000).

▸ HOUSING

In 2010, the average household size in Nassau County was approximately 2.9 persons compared to an average family size within the county of 3.4 persons. According to the 2010 U.S. Census, there were approximately 468,346 housing units, about 80 percent of which were owner occupied (U.S. Census Bureau 2010a). The median value of homes in Nassau County in 2010 was $487,900 and the median rent was $1,447 (U.S. Census Bureau 2006-2010). These housing costs are considerably higher than the statewide median home value of $301,000 and median rent of $1,025 (U.S. Census Bureau 2010c).

In 2010 families accounted for nearly 77 percent of the households in the county, with an estimated 62 percent of the families identified as married couples and approximately 15 percent identified as other families. During the same timeframe, nonfamily households comprised an estimated 23 percent of all households in the county (U.S. Census Bureau 2010b).

► ECONOMY

In 2010, Nassau County had a labor force of approximately 690,926 persons and an unemployment rate of 5.8 percent, slightly higher than the state rate of 4.8 percent. However, the county had an estimated median household income of $93,613 and estimated per capita personal income of $41,387, both above the statewide figures for the same year (approximately $56,000 and $31,000, respectively). The poverty rate of Nassau County, 5.1 percent, also compares very favorably to the state average of nearly 14 percent. Between 2000 and 2010 the county's per capita income grew by 28.7 percent (U.S. Census Bureau 2010b, U.S. Census Bureau 2000).

3-3. NASSAU COUNTY: EMPLOYMENT SECTORS

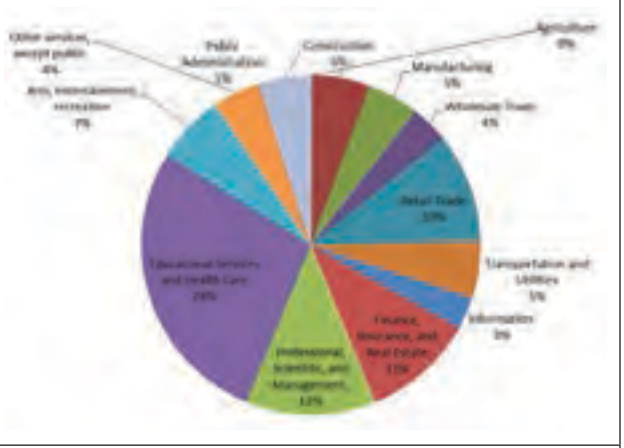


Chart 3-3: Nassau County Employment Sectors.
Source: U.S. Census Bureau 2010.

The distribution of employment by industry in Nassau County was concentrated in four major sectors:

- Educational services, health care, and social assistance: 27 percent
- Professional, scientific, management, and administrative and waste management services: 12.3 percent
- Finance, insurance, and real estate: 10.8 percent
- Retail trade: 10.2 percent

Suffolk County

► POPULATION TRENDS

In 2010, Suffolk County had the fourth largest county population in New York State, with an estimated 1,493,350 residents, and a population density of approximately 1,637 people per square mile (U.S. Census Bureau 2010a, StatsIndiana 2012). Between 1990 and 2011 the population in Suffolk County grew by 13.4 percent (StatsIndiana 2012). Approximately 98 percent of the population reported only one race in 2010, with an estimated 81 percent reporting white and approximately 7 percent reporting African-American. Approximately 16.5 percent of the Suffolk County population reported to be of Hispanic origin (U.S. Census Bureau 2010a).

Approximately 85 percent of the people living in Suffolk County in 2010 were native to the United States, with 77 percent born in New York State. Nearly 20 percent of the Suffolk County residents who were 5 years or older in 2010 spoke a language other than English at home. Of those residents, 58 percent spoke Spanish and 42 percent spoke some other language. Additionally, 45 percent of those that spoke a language other than English at home reported that they did not speak English "very well" (U.S. Census Bureau 2010b).

Like Nassau County residents, those who live in Suffolk County have more education than the state as a whole. Approximately 89 percent of Suffolk County residents 25 years and over had at least graduated from high school (compared to 84 percent statewide) and an estimated 32 percent had a bachelor's degree or higher (consistent with the statewide rate of 32 percent). Fourteen percent of the population had completed a graduate or professional degree as well, which also is consistent with statewide rates for this level of education (U.S. Census Bureau 2010b). Similar to Nassau County, education levels in 2010 are consistent with those reported in the 2000 Census (approximately 89 percent of residents had at least a high school degree, and 31 percent had a bachelor's degree or higher) (U.S. Census Bureau 2000).

There are two Native American reservations in Suffolk County: the Poospatuck reservation in Mastic and the Shinnecock reservation in Shinnecock Bay, Southampton. The Shinnecock Indian Nation tribe is among the oldest self-governing tribes in the United States, has been a state-recognized tribe for over 200 years, and became a federally-recognized tribe in 2010. The Unkechaug

Indian Nation of the Poospatuck Reservation is a state-recognized tribe with its 55-acre reservation located on Poospatuck Creek in Mastic.

▸ HOUSING

Similar to Nassau County, the average household size in Suffolk County in 2010 was 2.9 persons compared to an average family size of 3.4 persons. During this same year, there were 567,748 housing units in Suffolk County. In 2010, the county had 499,922 occupied housing units, approximately 79 percent of which were owner occupied. In 2010, Suffolk County homes had a median value of $424,000 and a median rent of $1,461 (U.S. Census Bureau 2010b). These figures are comparable to Nassau County and also trend above median housing value and rent for New York State as a whole (U.S. Census Bureau 2010c).

Families made up almost 76 percent of the households in Suffolk County, with approximately 60 percent of the families identified as married-couples and approximately 16 percent identified as other families. Nonfamily households made up an estimated 24 percent of all households in the county (U.S. Census Bureau 2006-2010).

▸ ECONOMY

In 2010, Suffolk County had a labor force of approximately 772,746 persons and an unemployment rate of 5.8 percent, above the state average of 4.8 percent. However, during the same timeframe, the county had an estimated median household income of $84,506 and per capita personal income of approximately $35,755, both of which are above the estimated statewide figures of approximately $56,000 and $31,000, respectively. The poverty rate of Suffolk County, 3.8 percent, also compares very favorably to the state poverty rate of approximately 14 percent . Between 2000 and 2010 the county's per capita income grew by nearly 16 percent (U.S. Census Bureau 2010b, U.S. Census Bureau 2000).

3-4. SUFFOLK COUNTY: EMPLOYMENT SECTORS

Chart 3-4: Suffolk County Employment Sectors.
Source: U.S. Census Bureau 2010.

Census data reported that between 2006 and 2010 the distribution of employment, by industry, in Suffolk County was concentrated in three major sectors:

- Educational services, health care, and social assistance: 25 percent
- Retail trade: 11.7 percent
- Professional, scientific, management, and administrative and waste management services: 11.1 percent (U.S. Census Bureau 2010b).

Fire Island

Fire Island is located in southern Suffolk County, south of Long Island, and is separated from the mainland portion of Long Island by the Great South Bay. Approximately 80 percent of Fire Island is public park land that will remain open and undeveloped. The entire landmass known as Fire Island includes the Robert Moses State Park, which is west of the western boundary of the national seashore, and Fire Island National Seashore, which has within its boundaries Smith Point County Park, Bellport Beach, Leja Beach and Marina (Brookhaven Town Beach/Davis Park) and Atlantique Beach & Marina (Islip Town Beach). Also included within Fire Island National Seashore is privately developed land within 17 distinct communities. When the Seashore was established in 1964, its enabling legislation stated that these communities and pre-existing commercial uses would be allowed to remain, as long as development was consistent with zoning standards established by the Secretary of the Interior (NPS 1977). Zoning codes from the four zoning authorities having jurisdiction on Fire Island were approved by the Secretary in 1985.

The U.S. Census defines Fire Island, New York as comprising three separate census tracts: Fire Island Census Data Place (CDP), Ocean Beach Village, and Saltaire Village. Fire Island CDP is the largest of the three, with a total year-round population of 292 people (U.S. Census Bureau 2010a). The two villages have smaller populations: Ocean Beach Village has a total population of 79 people and Saltaire Village has an estimated population of 37 people (U.S. Census Bureau 2010a). This amounted to an Island-wide total of 408 year-round residents in 2010. This represents a decline of approximately 17 percent from the population as counted by the U.S. Census in 2000, which identified 491 year-round residents on Fire Island (U.S. Census Bureau 2000a). A total of 4,200 structures are located on Fire Island, the vast majority of which are residential-units that are occupied during the summer visitor season.

▸ LAND AREA/POPULATION DENSITY

The land area of the Fire Island CDP is approximately 9 square miles, 7 miles of which are designated federal wilderness. The villages of Ocean Beach and Saltaire are considerably smaller in their land area, each being considerably less than one-half square mile. Fire Island CDP, comprising 15 communities within two towns (Islip and Brookhaven) had a population density of approximately 34 people per square-mile in 2010. In contrast, Ocean Beach Village had a population density of approximately 654 people per square mile, and Saltaire Village approximately 132 people per square mile. The population density for each of these communities within Fire Island CDP was much lower than that of Suffolk County in the same year (over 1,600 people per square mile) (U.S. Census Bureau 2010b). As mentioned in previous sections, the seasonal population density on the Fire Island CDP is significantly higher during the summer months due to the presence of summer residents and visitors. U.S. Census data only considers a family or individual's primary place of residence when calculating population and population density.

▸ POPULATION CONCENTRATIONS AND TRENDS

Fire Island CDP

The Fire Island CDP had a permanent year-round population of 292 residents in 2010,[13] and the median age was approximately 46; notably higher than the county's median age of nearly 40 (U.S. Census Bureau 2010a). The Fire Island CDP's permanent year-round population in 2000 was 310, indicating a decline in population of approximately 6 per cent between 2000 and 2010 (U.S. Census Bureau 2000a).

Ocean Beach Village

In 2010, Ocean Beach Village had a permanent population of approximately 79 residents. The median age for Ocean Beach in 2010 was approximately 55, notably higher than the county's median age of nearly 40 (U.S. Census Bureau 2010a). Ocean Beach's permanent year-round population in 2000 was 138, indicating a decline in year-round population of approximately 43 percent between 2000 and 2010 (U.S. Census Bureau 2000a).

Saltaire Village

In 2010, Saltaire Village had a permanent population of 37 residents, and the median age for the Village was 55, well above the county (U.S. Census Bureau 2010a). Saltaire's permanent year-round population in 2000 was 43, indicating a decline in year-round population of approximately 14 percent between 2000 and 2010 (U.S. Census Bureau 2000a).

13 There are no population size requirements for the CDPs designated in conjunction with Census2000 and 2010. For the 1990 and earlier censuses, the U.S. Census Bureau required CDPs to qualify on the basis of various minimum population size criteria. Therefore, 1990 data for Fire Island CDP is not available.

TABLE 3-6: SUMMARY OF POPULATION CHARACTERISTICS AND TRENDS, FIRE ISLAND, NY*

	Fire Island CDP	Ocean Beach (village)	Saltaire (village)	Total / Average
2010 (Year-round residents)	292	79	37	408
2000 (Year-round residents)	310	138	43	491
Percentage Change in population – 2000 to 2010	- 6%	- 43%	- 14%	-17%
2010 Median Age	46	55	55	52
2000 Median Age	42	42	37	40

**U.S. Census, 2000, 2010*

► HOUSING

Fire Island CDP

In 2010, the average household size in Fire Island CDP was 2.4 persons. There were approximately 3,029 housing units and a housing density of approximately 352 homes per square mile. Fire Island CDP had nearly 120 occupied housing units in 2010, of which approximately 81 percent were owner occupied. Nearly 3,000 (96 percent) housing units within Fire Island CDP were reported to be vacant in 2010 and were intended for seasonal, recreational, or occasional use (U.S. Census Bureau 2010a, U.S. Census Bureau 2010b). In 2010, families made up approximately 65 percent of the households in Fire Island CDP. Homes in Fire Island CDP had a median value of $378,600. (U.S. Census Bureau 2010a, U.S. Census Bureau 2010b).

Ocean Beach Village

Similar to the Fire Island CDP, the average household size in Ocean Beach Village was 2.0 persons in 2010. There were more than 600 housing units, with a housing density of almost 4,300 homes per square mile. Approximately 92 percent of the housing units were owner-occupied, though more than 90 percent of the village's housing units were reported to be vacant in 2010. This is consistent with the fact that most (99 percent) residential units within Ocean Beach Village are for seasonal, recreational, or occasional use. In 2010, families made up approximately 34 percent of the households in the village. Homes in Ocean Beach Village had a median value of $820,800 in 2010 (U.S. Census Bureau 2010a, U.S. Census Bureau 2010b).

Saltaire Village

The average household size in Saltaire Village in 2010 was 2.6 persons. There were over 450 housing units, with a housing density of approximately 1,600 units per square mile. The village had 33 occupied housing units (7.3 percent of the total housing units), 93 percent of which were owner occupied in 2010. As evidenced by the U.S. Census Bureau data, and consistent with conditions in Ocean Beach Village CDP and Fire Island CDP, nearly all of the housing units within Saltaire Village are for seasonal, recreational, or occasional use. Families made up approximately 67 percent of the households in the village in 2010. Homes in Saltaire Village had a median value of more than $1,000,000 in 2010 (U.S. Census Bureau 2010b).

TABLE 3-7: SUMMARY OF HOUSING, FIRE ISLAND, NY*

	Fire Island CDP	Ocean Beach (village)	Saltaire (village)	Total / Average
Total Housing Units	3029	601	458	4088
Housing Density (Land Area)	352 units/ sq. mi. (9.2 square miles)	4,300 units / sq. mi. (0.1 square mile)	1600 units/ sq.mi. (0.3 square mile)	—
Occupied Housing Units (Year round)	120	53	33	206
Household size (average)	2.4	2.0	2.6	2.3
% Owner Occupied	81%	92%	93%	—
% Households described as families	65%	34%	67%	—
Median Home Value (2010)	$ 378,600	$ 820,800	$ 1,000,000	$ 732,900

**U.S. Census, 2010*

► ECONOMY

Fire Island CDP

In 2010, Fire Island CDP had a labor force of 127 persons and an unemployment rate of approximately 7.2 percent, which is above the Nassau and Suffolk County and state averages of nearly 5.8 percent and 4.8 percent, respectively. Despite the elevated unemployment rate, the CDP had an estimated median household income of $64,250 in 2010 and an estimated per capita personal income of approximately $41,100, well above the estimated 2010 Nassau and Suffolk County and New York State averages. Although incomes continued to be above state averages, between 2000 and 2010, the per capita income in Fire Island CDP decreased by nearly 6 percent, compared to a 32 percent increase statewide.

According to 2010 Census data, distribution of employment by industry in Fire Island CDP was concentrated in three major sectors (U.S. Census Bureau 2010a):

- Educational services, and health care and social assistance: 25 percent
- Retail trade: 21 percent
- Professional, scientific, and management, and administrative and waste management services: 19 percent

This is a significant change from 2000, when the professional, scientific, and management, and administrative and waste management services sector (formerly categorized as "management, professional, and related occupations) accounted for 46 percent of the labor force in Fire Island CDP, followed by sales and office occupations (24 percent) and construction, extraction, and maintenance occupations (23 percent) (U.S. Census Bureau 2000).

Ocean Beach Village

According to 2010 Census data, Ocean Beach Village had a labor force of over 60 persons and a 100 percent employment rate. The village had an estimated median household income of approximately $60,800 and per capita personal income of approximately $52,000. The village's estimated median household and per capita incomes are lower than the estimated 2010 averages for Nassau and Suffolk County, though are still notably above statewide averages. Additionally, between 2000 and 2010, the per capita income for residents in Ocean Beach Village increased approximately 80 percent, compared to a 32 percent increase for the state.

2010 Census data shows that distribution of employment by industry in Ocean Beach village was concentrated in four major sectors:

- Arts, entertainment, and recreation, and accommodation and food services: 36 percent

- Finance and insurance, and real estate and rental and leasing: 19 percent
- Educational services, and health care and social assistance: 12 percent
- Transportation and warehousing and utilities: 11 percent

Similar to conditions at Fire Island CDP, employment concentrations have notably changed since 2000 when the largest employment sector for residents of Ocean Beach Village CDP was professional, scientific, and management, and administrative and waste management services (31 percent of the labor force) (U.S. Census Bureau 2010b, U.S. Census Bureau 2000), followed by sales and office occupation (28 percent), construction, extraction, and maintenance occupations (19 percent), and production, transportation, and material moving occupations (17 percent).

Saltaire Village

Saltaire Village had a labor force of 26 persons and a 100 percent employment rate in 2010. The village had an estimated median household income of approximately $81,800 and an estimated per capita personal income of $72,100, both of which are well above statewide estimates for the same year. The median household incomes are similar to those reported for Nassau and Suffolk County, though the per capita income is notably higher. Since 2000, per capita income estimates in Saltaire Village increased over 300 percent.

2010 Census data shows that distribution of employment by industry in Saltaire village was limited to 7 sectors (U.S. Census Bureau 2010b):

- Construction: 35 percent
- Retail trade: 17 percent
- Educational services, and health care and social assistance: 23 percent
- Finance and insurance, and real estate and renting and leasing: 8 percent
- Professional, scientific, and management, and administrative and waste management services: 10 percent
- Other Services, except public administration: 5 percent
- Public Administration: 2 percent

Consistent with conditions at Fire Island and Ocean Beach Village CDP, employment distribution has notably changed since 2000 when the labor force was concentrated in what is now the professional, scientific, and management, and administrative and waste management services sector (50 percent). The labor force was further distributed into the sales and office occupations (25 percent), construction, extraction, and maintenance occupations (13 percent) and service operations (13 percent) sectors (U.S. Census Bureau 2010b).

TABLE 3-8: SUMMARY OF ECONOMY, FIRE ISLAND, NY*

	Fire Island CDP	Ocean Beach (village)	Saltaire (village)	Total/ Average
Labor Force (Employed Persons)	127	60	26	213
Unemployment Rate	7.2	0	0	---
Median Household Income	$ 64,250	$ 60,800	$ 81,800	$ 68,950
Per Capita Income	$ 41,100	$ 52,000	$ 72,100	$ 55,100
Employment by Sector				
Construction	4%	0%	35%	---
Manufacturing	0%	11%	0%	---
Retail trade	18%	7%	18%	---
Transportation and warehousing, and utilities	6%	11%	0%	---
Finance and insurance, and real estate and rental and leasing	8%	13%	8%	---
Professional, scientific, and management, and administrative and waste management services	14%	0%	10%	---
Educational services, and health care and social assistance	36%	18%	23%	---
Arts, entertainment, and recreation, and accommodation and food services	10%	36%	0%	---
Other services, except public administration	0%	5%	5%	---
Public administration	4%	0%	3%	---

U.S. Census, 2010

Community Character

To establish baseline conditions and gain a more complete understanding of the resources and values that define Fire Island, the NPS prepared a Community Character Study for Fire Island, New York. The study was co-sponsored by the National Parks & Conservation Association (NPCA) and was undertaken by A. Nelessen Associates, Inc, a firm that pioneered the type of visual analysis used in the study. The final report, completed in July 2012, evaluates and describes the physical features of Fire Island's 17 residential communities.

The study process employed a series of over 200 images of Fire Island as well as a series of demographic, policy, and market questions to develop a fuller understanding of participant responses to the images. Data for the report was collected through a project website established for these purposes. Input from 545 total participants (local residents and visitors) was collected between November 2009 and January 15, 2010 and analyzed to identify the values and issues that are of the greatest concern.

According to the results of the online analysis, a vast majority (85 percent) of the participants have either resided on or visited Fire Island for at least 10 years. Of those who reside on Fire Island, the largest number of respondents reported living in Seaview (14 percent), Fair Harbor (13 percent), or Fire Island Pines (10 percent). The majority of respondents were seasonal residents, with approximately 33 percent residing on the island for 3-6 months per year. Nearly all participants identified that they are either 'satisfied' (approximately 42 percent) or 'highly satisfied' (approximately 53 percent) with the general quality of life on Fire Island.

The project website presented viewers with various images from Fire Island that portrayed a range of features and characteristics that defined the island's built environment and larger landscape. These features

and characteristics included the natural environment, vehicular circulation, pedestrian ways, entrances, fences, landscaping, residential development, commercial development, gathering places and recreational spaces, and mobility (getting around). Participants were asked to rate each image either positively or negatively, based on how each made them feel. Four images received exceptionally high positive ratings: a community gathering place at sunset; pedestrians on a boardwalk; people disembarking from the ferry; and an assembly of carting wagons. These images spoke much more to the distinct experience of place rather than specific elements of the built environment.

However, this is not to imply that respondents were neutral on topics related to the built environment and larger landscape on Fire Island. Images of the natural beaches and dunes, dune vegetation efforts, wildlife, and naturalized portions of the bayshore all scored positively in the natural environment category. Boardwalks with loosely landscaped or natural edges, well-designed entrances and fencing associated with private residences, and naturalized, "beach tolerant" landscape treatments all elicited positive responses. In terms of residential development, positive responses appeared to be driven less by architectural style than by materials, colors, window configuration, and landscaping. The highest-rated images of residential development depicted structures of natural wood, white trim, lots of windows, and natural landscape treatments. Images of gathering places and recreational spaces that also garnered positive responses included activities like fishing, clamming, the ferries, and youth- and family-based activities. Finally, in terms of mobility, walking and water-based transportation dominated the positively rated images.

Few images were universally disliked, but included cyclone or chain-link fencing and unscreened collections of construction material or debris that accumulate under elevated properties.

Images given the highest ratings by study participants. *Source: A.Nelessen Associates, Inc.*

Fire Island National Seashore's Contribution to the Local Economy

National park tourism is a significant driver in the national economy returning $10 for every $1 invested in the National Park Service. These findings are the result of a peer-reviewed visitor spending analysis conducted by U.S.G.S. economists for the National Park Service. The report shows $14.7 billion of direct spending by 283 million park visitors in communities within 60 miles of a national park unit. This supported 243,000 jobs nationally, with 201,000 jobs found in the gateway communities, and had a cumulative benefit to the U.S. economy of $26.75 billion (Cullinane Thomas et al, 2014).

In 2012, Fire Island National Seashore had about 483,000 recreational visitors resulting in an estimated $19 million spent within the Seashore or surrounding communities. It is estimated that the monetary impacts from visitor spending supported 206 jobs (Cullinane Thomas et al, 2014).

Non-federal Lands within Fire Island National Seashore

Fire Island encompasses approximately 19,579 acres of marine and terrestrial lands, of which the NPS owns over 6,240 acres. The remainder of Fire Island is divided between other public lands (approximately 12,420 acres) and privately owned lands (approximately 920 acres). There are 17 communities within the Seashore, which include approximately 4,200 privately held developed properties.

In 1938, Robert Moses, as chairman of the Long Island State Park Commission, proposed creating a spur of the Ocean Parkway that would traverse the length of Fire Island. This project never materialized but it has been viewed as a major impetus behind local support for the Seashore's creation. The proposed Ocean Parkway Extension would have been developed through a number of Fire Island communities that were otherwise accessible only by ferry. Its construction would have meant the condemnation of hundreds of homes, most occupied by summer residents. Due to fears of reduced property values and the loss of isolation on Fire Island, as well as concerns over the high cost of the proposed project, the Suffolk County Board of Supervisors ultimately voted against the Moses plan. In 1964, Congress established the Fire Island National Seashore, largely in response to pressure to protect Fire Island from the real estate development and population growth that were engulfing Long Island. The decision to leave substantial amounts of land within the Seashore in the hands of homeowners prompted the development of a complex system of land-use regulations intended to achieve federal land-management objectives through local zoning ordinances. There were two legislative objectives: first, to protect the natural environment; and second, to make the natural beauty of Fire Island available to the visiting public for recreational uses in harmony with the first (Kaufman and Starks 2008). The Seashore's boundary, established in its enabling legislation, recognized 17 communities contained within it. These communities are, from west to east:

- Kismet (including Seabay Beach)
- Saltaire
- Fair Harbor
- Dunewood
- Lonelyville
- Atlantique
- Robbins Rest
- Fire Island Summer Club
- Corneille Estates
- Ocean Beach
- Seaview
- Ocean Bay Park
- Point O'Woods
- Cherry Grove
- Fire Island Pines
- Water Island
- Davis Park (including Ocean Ridge)

Some Fire Island communities have only a few housing units, while others have hundreds of houses. A few of the communities have restaurants, grocery stores, retail stores, and other businesses. Only a small number of residents remain on Fire Island during the winter; however the population increases dramatically during the summer and early fall months. The primary policing authorities on Fire Island are the Suffolk County Police Marine Bureau and the NPS park rangers. Zoning is under the jurisdiction of four distinct municipalities: the towns of Islip and Brookhaven and the villages of Saltaire and Ocean Beach. In addition, some of these communities have homeowners' associations that provide additional guidance on land use and zoning

requirements within their communities. The Fire Island National Seashore Land Protection Plan (NPS 1984b) directed the NPS to support the local communities in developing appropriate zoning and development within the communities. It also called upon these communities and the county that governs them to support the NPS by protecting open space and other resources within their boundaries.

By 1967, the failure of land management on Fire Island was already apparent. Critics of the Seashore believed that there was too much development on the NPS's own land and not enough regulation on private land to protect Fire Island's resources. In order to satisfy these critics, the NPS had dropped most of its recreational development plans by 1975. Despite these efforts, the existing land-use and zoning patterns have allowed Fire Island's natural resources to continue to degrade. These conditions are addressed in the respective resource sections of this chapter. The potential causes of these conditions have been identified and are described below:

- Traditional zoning, which is designed to separate uses from each other, is poorly suited to manage the problems of development on a dynamic barrier island where the dominant land-use problems are erosion and impacts on natural resources.
- The federal dune district line, delimiting the area most in need of protection from development, has never been re-mapped, with the consequence that it has literally drifted out to sea as Fire Island has shifted over time.
- NPS is not able to enforce the federal standards effectively because it lacks an effective enforcement mechanism (Kaufman and Starks 2008).

In addition to these residential communities, there are several state and local parks on Fire Island. Robert Moses State Park, an 875-acre park on the western end of Fire Island, is outside of the boundaries of Fire Island National Seashore but adjacent to the Seashore's west end, in the vicinity of the Fire Island Light Station. Robert Moses State Park includes approximately 5 miles of ocean beach where visitors can swim, surf or surf-fish. Anglers can also fish from piers. A day-use boat basin can accommodate 40 boats. The state park also has picnic areas and an 18-hole pitch & putt golf course. A fee is charged to use the state park's parking lot, which provides pedestrian access to Fire Island National Seashore. Robert Moses State Park provides 8,200 parking spaces among four parking lots, including the 2,460-space lot adjacent to Fire Island National Seashore. All four parking fields fill up at times during the summer months.

Smith Point County Park, within the boundary of the Seashore, is located on the opposite end of Fire Island. This area extends six miles east from Smith Point West to Moriches Inlet. The park is accessible via the William Floyd Parkway and is the county's largest oceanfront park, with swimming, scuba diving, surfing, saltwater fishing, camping, outer beach access, food concession, playground, showers, as well as seasonal special events. Reservations are required for all the sites in the campground. All sites have water, and many have electric hookups and sewer outlets. Outer beach camping is available on a first come, first served basis, beach conditions permitting. Off-road vehicles with a permit are allowed to drive on the eastern portion of the outer beach for recreational purposes. Smith Point County Park provides one parking lot of 4,000 spaces. National Park visitors can access the Fire Island Wilderness by walking from the Smith Point parking lot to the Fire Island Wilderness Visitor Center.

Finally, there are four recreational facilities operated by local municipalities. Atlantique Beach is owned and managed by the Town of Islip and includes a marina with approximately 150 boat slips, ferry access, snack bar, and restrooms. Leja Beach is located in the center of the community of Davis Park and is owned and managed by the Town of Brookhaven. It includes a 200-slip marina, ferry access, public restrooms, restaurant, store, and other amenities. Bellport Beach bisects the Fire Island Wilderness and is for the exclusive use of Bellport

residents. It has a small marina and docking area, ferry access, snack bar, and restrooms. Great Gun Beach is owned and managed by the Town of Brookhaven, though located at the eastern end and within the boundary of Smith Point County Park. It has a small marina, ferry access, snack bar, and restrooms.

SEASHORE OPERATIONS

Most of the land that is now Fire Island National Seashore was formerly a mix of public and private lands. The Seashore was designated in 1964 and included these lands, along with 17 residential communities. The facilities, roads, buildings, and utilities currently used for Seashore operations and by the visiting public are a mix of structures that existed prior to the establishment of the Seashore, as well as new infrastructure installed by the NPS.

Concessions & Commercial Services

Fire Island National Seashore has three main concessions contracts that manage the commercial aspects of visitor services: the Davis Park Ferry Company, the Sayville Ferry Service, Inc., and Fire Island Concessions, LLC, which was awarded a 10-year contract in the spring of 2005. This is a new and innovative approach for the Seashore that expanded the concessioner's responsibility for maintenance and capital improvements in the assigned areas. This contract covers all marinas, the campground, a store, snack bars, restaurant, and docking at both the Sailors Haven and Watch Hill Marinas.

Sailors Haven contains a marina and snack bar operated by concessioners and a lifeguarded beach administered by the NPS. Watch Hill also includes a marina and beach area, as well as a restaurant, snack bar, store, and campground, which are operated by concessioners. Talisman contains a dock facility for ferry landings and boaters to offload their beach gear. Additionally, there is a renovated concession area for snacks, restrooms, and showers, though the snack bar remains closed.

Concessioners are responsible for routine maintenance of the structures they use to support their services. However, concession contracts do not cover the maintenance and repair of all infrastructure related to their operation. Monies for the Seashore's circulation and access and marine channel maintenance are not routinely included in the Seashore's budget, but come from the regional or national NPS account by request.

Administrative and Maintenance Facilities

The Seashore's administrative and maintenance operations are based out of two locations along the Patchogue River, in the village of Patchogue on Long Island and at the William Floyd Estate. The Seashore's headquarters building is a small two-story structure along the river at 120 Laurel Street. There is a small gravel parking lot to the south and pull-in, off-street parking that provides ample parking for the NPS staff stationed there, as well as for the adjacent Seashore boat dock. The building houses offices for the superintendent, information officer, administrative officer, chief ranger, facility manager, the chief of natural resource management, and three assistants. The cultural resource management staff is based at the William Floyd Estate near Mastic Beach on Long Island, about a 30-minute drive from Patchogue. The headquarters building is connected to the village's utility system and is provided with electric, water, natural gas, and phone service by local utilities. Due to the high water table and proximity to the river, the building's on-site septic disposal system often backs up. Also, the parking area and yard flood during extreme tides and storm events, making parking difficult and dangerous.

The remainder of the Seashore's administrative and maintenance facilities are housed in a small complex of buildings approximately 1/3 of a mile from the headquarters, in an area called the Patchogue Maintenance Facility (PMF) on West Avenue: the "deli" building and a converted warehouse. The "deli" building (a name reflecting its original use), formally referred to as PMF-A, is located immediately on West Avenue, was constructed in the 1940s or 1950s. PMF-A houses the Seashore's information technology department, park planning, and resource management offices. It is served by local utilities but is connected to an on-site septic disposal system for waste water, located beneath a gravel parking lot behind the building which also provides access and staff parking to the warehouse.

The warehouse is set back from West Avenue closer to the Patchogue River. The warehouse was acquired by the NPS in the 1970s and is divided into two areas. One area, referred to as PMF-B, has been remodeled to support office use and is climate controlled. This portion houses workshop space for painting and woodworking, the Seashore's library, and offices for administration, interpretation, and resource management. Portions of the warehouse that are not climate controlled include the

FIRE ISLAND NATIONAL SEASHORE
GENERAL MANAGEMENT PLAN

MAP 3-E OPERATIONS & MAINTENANCE FACILITIES - EXISTING CONDITIONS

Patchogue Ferry Terminal (NPS)
Seasonal Administrative Use

Park Administration
HQ *Administration and Operations*

William Floyd Estate
Visitor & Resource Protection
2 Units

Fire Island Wilderness Visitor Center
Vehicle Check Point, Visitor & Resource Protection

Watch Hill
Visitor & Resource Protection
12 Units

Talisman
2 Units

Sailors Haven
Visitor & Resource Proctection
3 Units

Carrington Houses
Under renovation - to be used for park housing (2 units)

Fire Island Light Station
Vehicle Check Point, Visitor & Resource Protection
7 Units

Operations / Maintenance Facilities
- Park Headquarters
- Ranger Station
- Maintenance Area
- Curatorial Facility
- Year-Round Staff Housing
- Seasonal Staff Housing

- Federal Land
- Fire Island Wilderness
- Island Community
- Protected Public Land
- Fire Island National Seashore Boundary
- Ferry Route

North
0 1 2 Miles

maintenance storage areas, garage, and a maintenance office. The warehouse building is connected to local utilities, including the village of Patchogue sewer system.

Behind the warehouse, the Patchogue River abuts a large gravel lot. A small storage building in the lot has been converted into the Seashore's small conference room (known as the River Room). A second small building houses the Seashore's vehicle maintenance shop. The remainder of the lot is used for employee parking and NPS vehicle and boat storage and maintenance. The NPS also maintains a marina, boat launch, and dock at this location for administrative purposes. Because there is limited space on Fire Island to store equipment, most of the Seashore's maintenance activities are initiated from this dock.

The property immediately to the north of the warehouse includes a public parking lot to accommodate the Seashore's ferry terminal in the same location. There is no charge to use the parking lot and it is usually filled to capacity on summer weekends. The ferry terminal building provides ferry ticket sales, restrooms, a sheltered waiting area, and a multi-purpose meeting room.

Staff Housing

Consistent with the Seashore's approved housing plan, staff housing is provided at several locations on Fire Island and at the William Floyd Estate. At Watch Hill, there are two housing units for concessioners' staff, nine units for NPS seasonal staff, and one unit remains unoccupied due to its location in a sensitive area (wetland). Talisman has two housing units for seasonal NPS employees. At Sailors Haven, three housing units are next to the maintenance area: one is used by an NPS concessioner and the other two are used by NPS seasonal employees. The housing units have limited utilities and are connected to on-site sewage disposal systems, like the other homes on Fire Island. Two units of staff housing are located at the William Floyd Estate on Long Island. The condition of a number of the cottages has deteriorated over the years. Repairs are made as staff and funding become available.

Operations

Operations at Fire Island National Seashore are divided into five functional areas: visitor and resource protection, interpretation and education, resource management, maintenance, and administration. In total, in fiscal year (FY) 2011, the Seashore employed 65 full-time equivalencies (FTE) and had an operational budget of approximately $4.9 million (NPS 2011a).

Visitor and Resource Protection

The Visitor and Resource Protection functional area represents the Seashore's operational resources that go toward protecting the Seashore and ensuring visitor safety. In FY 2011, there were a total of 18.3 full-time equivalent positions (FTE) available to address the responsibilities under this functional area. The total annual budget for this area was approximately $1.3 million, approximately 27 percent of the Seashore's total budget (NPS 2011a).

The visitor and resource protection staff includes Seashore rangers and ocean lifeguards who protect park visitors, resources, and property through professional services in law enforcement, emergency medical services, search and rescue, beach safety, and community assistance.

Interpretation and Education

The Interpretation and Education functional area is represented by interpretive and educational program staff including Seashore interpretive rangers and guides who provide visitor information, develop and deliver public and educational programming, operate visitor centers, design and develop non-personal media (exhibits, signage, publications, social media, etc.) and oversee the

volunteer program. In FY2011, there were a total of 9.7 FTE available to undertake the responsibilities associated with this functional area. The total annual budget for this area was approximately $ 640,000, approximately 13 percent of the Seashore's total budget (NPS, 2011a).

Resource Management

Operations in the resource management functional area include the monitoring, management, protection, and preservation of natural and cultural resources. The Seashore is charged with the protection of miles of ocean and bayside shoreline, uplands, wetlands, maritime forests, and endemic, migratory, and endangered species. In addition to natural resources, the Seashore is charged with protecting two historic properties – the William Floyd Estate and the Fire Island Light Station, both of which are listed on the National Register of Historic Places. The Seashore's List of Classified Structures identifies 40 historic structures as contributing resources associated with these properties. Resource management is one of the smallest functional areas of the Seashore, with only 8.7 FTE in FY2011. Expenditures in this area made up approximately 14 percent of the total Seashore expenditures, approximately $670,000 (NPS 2011a).

Maintenance & Facility Operations

Maintenance & Facility operations consist of activities that prolong the life of the Seashore's numerous assets – buildings, fleet, trails, utilities, roads and water channels – many of which are more than 40 years old and were not built for current visitation levels. In FY2011, 19.5 FTE were available for recurring maintenance, including facilities operations staff, accounting for 28% of the Seashore's budget (nearly $1.7 million in FY2011) (NPS 2011a).

Facility operations consist of the activities necessary to manage the Seashore's infrastructure efficiently and safely on a day-to-day basis, as well as to complete extensive opening and closing procedures before and after the peak summer season (June-September). Included in facility operations are the Seashore's utilities: public water, waste water, fuel distribution, fire suppression, and electrical systems. Most of these services are provided by utilities companies on Long Island; however, some are owned and operated by the Seashore. The Seashore's utility systems are exposed to extreme conditions in a marine environment, which has accelerated deterioration. This, along with a lack of routine maintenance, has led to increased expenses related to periodic repair and rehabilitation.

Management and Administration

The Management and Administration functional area is directed by the Superintendent's Office in cooperation with the management team. This team must address internal issues as well as focus on all external commitments. Administrative staff provide essential support to all Seashore operations. Park planning is part of this management team and provides support on issues related to building and zoning within the communities, as well as limited GIS support. The Administrative staff includes a public affairs and communication coordinator. Combined expenditures for these activities in FY11, including Superintendent's staff, totaled approximately $870,000, which accounted for 8.75 FTE and approximately 18 percent of total park funding, excluding investments (NPS 2011a).

As reported in the Seashore's 2004 Business Plan, all of these functional areas were evaluated as lacking the necessary staffing and funding the meet their objectives. Therefore, programs were likely to be cut or limited, facilities would not be kept in the optimal conditions, and Seashore resources would be exposed to potential damage (NPS 2004a). The Seashore's situation relative to funding for operations has remained largely unchanged.

4: Environmental Consequences

INTRODUCTION This chapter describes the probable consequences of the alternatives on natural and cultural resources, wilderness, transportation and access, visitor use and experience, park operations and the socioeconomic environment associated with Fire Island National Seashore (the Seashore). The alternatives presented in this draft document are general in nature, in that they define management objectives and outline potential actions that may result from those objectives; thus, the analysis of impacts is correspondingly general. Impact topics were selected for analysis by determining which Seashore resources or related elements would be affected by actions proposed under the three alternatives. Topics were also chosen to address planning issues and concerns. Resources and environmental concerns that would not be appreciably affected by any of the alternatives were eliminated from further consideration and are described in Chapter One.

METHODOLOGY FOR ASSESSING IMPACTS

General Analysis Methods

In accordance with the Council on Environmental Quality (CEQ) regulations, direct, indirect, and cumulative impacts are described (40 CFR 1502.16) and the significance of the impacts is assessed (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary; therefore, these methodologies are described under each impact topic.

▸ GEOGRAPHIC AREA EVALUATED FOR IMPACTS

The primary area of impact for the Fire Island National Seashore General Management Plan and Environmental Impact Statement (GMP/EIS) is Fire Island, located parallel to the south shore of Long Island, including segments of Great South Bay and the Atlantic Ocean, and the William Floyd Estate with the neighboring the village of Mastic Beach. The secondary area of impact includes Nassau and Suffolk counties, which together encompass most of Long Island, New York.

▸ DIRECT, INDIRECT, AND CUMULATIVE IMPACTS

Impact analysis addresses all of the following:

Direct Impact
An impact that is caused by an action and occurs at the same time and place.

Indirect Impact
An impact that is caused by an action but is later in time or farther removed in distance, but still reasonably foreseeable.

Cumulative impacts
Defined as those impacts that result when the impact of the proposed action is added to the impacts of other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7). A cumulative impacts analysis is intended to give a better picture of the additive or total impacts a given resource may experience when the impacts of unrelated actions or events are added to the predicted impacts of the GMP

alternatives being evaluated in this EIS are added to the impacts of unrelated actions or events that may also be affecting the same resource.

Beneficial Impacts
A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse Impacts
A change that moves the resource away from a desired condition or detracts from its appearance or condition.

▸ ASSESSING IMPACTS USING COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) CRITERIA

The impacts of the alternatives are assessed using the CEQ definition of "significantly" (40 CFR 1508.27), which requires consideration of both context and intensity:

a. Context – This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than on the world as a whole. Both short- and long-term effects are relevant.

b. Intensity – This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect would be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime farmlands, wetland, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Context is comparative or surrounding information that helps give impacts meaning. Comparisons can include geography, population size, uniqueness of the resource, affected individuals, agency mandates, and more. For example, the impact of a proposal to cut 10 acres of trees in a 100,000-acre lodgepole pine forest managed by an agency with a "use" mandate is different than cutting 10 acres of the only remaining 15 acres of old-growth sequoia managed by an agency with a "conservation" mandate.

The National Park Service (NPS) is an agency with a "conservation" mandate and identifies fundamental resources and values in its general management plans, defined as those resources or values that are critical to achieving a park's purpose or maintaining its significance. These resources and values collectively capture the essence of the park and provide overall context for evaluating the relative severity of an impact; e.g., the degree to which an alternative would help or hurt these resources would be important in assessing whether impacts of that alternative are significant.

Fundamental resources identified for Fire Island National Seashore are described in Chapter 1 of this GMP/EIS.

For each impact topic analyzed, an assessment of the potential significance of the impacts according to context and intensity is provided in the "Conclusion" section that follows the discussion of the impacts under each alternative. In addition to the overall context of the park's purpose and significance, resource-specific context is presented in the "Methods" section under each resource topic and applies across all alternatives. Intensity of the impacts is discussed by considering the relevant factors from the list above. Intensity factors that do not apply are not discussed.

NATURAL RESOURCES:
Impacts on Coastal Processes and FloodPlains

Methodology

The impact analysis for coastal processes and floodplains assumes that actions conducted under each alternative would adhere to applicable federal, state, and local laws and policies including:

- Coastal Zone Management Act of 1972
- 1899 Rivers and Harbors Act
- Coastal Barrier Improvement Act of 1990
- Executive Order 11988: Floodplain Management
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- NPS Procedural Manual 77-2: Floodplain Management
- New York State Coastal Zone Management Plan and Policies
- New York State Department of Environmental Conservation Laws and Polices
- New York State Coastal Erosion Hazard Area Act (CEHA)
- Fire Island Inlet to Montauk Point (FIMP) Reformulated Storm Damage Protection Plan
- Tidal Wetlands Land Use Regulations

Executive and departmental orders offer guidance on addressing climate change relative to both Coastal Processes and Floodplains. Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change calls for the integration of climate science in policies and planning of government agencies. DOI Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources requires that each DOI bureau and office consider and analyze potential climate change impacts when undertaking long-range planning exercises.

A few of the relevant policies, as they apply to the GMP-related actions, are summarized in the following sections along with the impact analysis methodology for the impact topic of coastal processes and floodplains.

▸ COASTAL PROCESSES

The analysis of coastal processes within the study area is based on a review of existing data for the project area, recent scientific literature, and shorelines in similar geomorphic settings.

In accordance with the federal Coastal Zone Management Act of 1972, as amended, New York State passed the Coastal Erosion Hazard Act (CEHA) (Article 34 of NYS Environmental Conservation Law) in 1981. At Fire Island, CEHA is administered by the New York State Department of Environmental Conservation (NYS DEC) in the town of Islip, and separately by the villages of Saltaire and Ocean Beach, and by the town of Brookhaven, after their local codes were approved by NYS DEC. This state law regulates activities in areas designated as coastal erosion hazard areas including construction, modification, restoration, or placement of a structure. Changes in land conditions such as grading, excavation, and dredging also are regulated under CEHA. The CEHA boundaries encompass the entire shoreline of New York State. Regulations associated with CEHA have been implemented at Fire Island since 2001.

Other relevant regulations of New York State include the Tidal Wetlands Land Use Regulations (6NYCRR part 661), which are also administered by the NYS DEC. The regulations are designed to prevent the despoliation and destruction of tidal wetlands, found extensively around the perimeter of Great South Bay and Fire Island. Projects that alter tidal wetlands, such as boat ramps, docks, erosion control measures, groins, breakwaters,

and boardwalks require authorization through the Tidal Wetlands Program. Many of these types of structures are used by the NPS at facilities such as Sailors Haven and Watch Hill and have undergone NYS DEC review and approval.

▸ FLOODPLAINS

Coastal floodplains often include a variety of habitat types found below the 100-year base flood elevation that may include estuaries, saltmarshes, mudflats, shoreline beaches, dunes, and maritime vegetated uplands. Protection of these resources helps absorb the forces of catastrophic flood events, protecting other sensitive riparian habitats and property. Executive Order 11988: *Floodplain Management and NPS Procedural Manual 77-2: Floodplain Management* are intended to properly conserve, manage, and protect floodplains on NPS lands. The purpose of regulating activities within the flood zone is to protect human health and the environment and prevent damage to property in the event of a catastrophic flood event.

The NPS *Procedural Manual 77-2* requires that structures and facilities within the flood zone be designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR 60). Structures must have professionally engineered flood-proofing measures to manage flood hazards. In addition, flood warning and evacuation plans must be designed and determined to be adequate to manage flood hazards.

Procedural Manual 77-2 also applies to actions that are functionally dependent on locations in proximity to water and for which non-floodplain sites are never a practicable alternative. Examples of actions functionally dependent upon water include marinas, docks, piers, water intake facilities, sewage outfalls, bridges, flood control facilities, water monitoring stations, drainage ditches, debris removal, outdoor water sports facilities, and boardwalks to interpret wetlands. *Procedural Manual 77-2* requires that such structures and facilities be designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR Part 60). Certain Seashore functions, however, do not require adherence to *Procedural Manual 77-2*when they are located near water for the enjoyment of visitors, such as scenic overlooks, foot trails, and associated daytime parking, provided the impacts of these facilities on floodplain values are minimized. In addition, entrance, access, and internal roads to or within units of the National Park System are exempted from the requirements of *Procedural Manual 77-2*, as are historic or archeological sites or artifacts whose location is integral to their significance.

Information on flood zones for the Seashore was gathered using FEMA mapping based on the 100-year flood event. This information was used to predict the degree of flooding as it relates to actions posed by the various alternatives. Most of Long Island is classified as Zone X by FEMA. Lands that border the edge of the Patchogue River, like the Seashore Headquarters, the ferry terminal, and portions of the maintenance area, fall within the area classified as Zone AE. At the William Floyd Estate, most of the property is above the 100- and 500-year flood zones; however, the portions of the property along the marsh shoreline are classified as Zone X by FEMA (FEMA 2009b). All other Fire Island properties fall within various flood zone designations, the majority of which are defined by FEMA as Zone AE or Zone VE. Areas on Fire Island excluded from these zones include sections of high dunes on oceanside that reach elevations exceeding 20 feet.

In general, all areas at elevation 6 feet and below in the Patchogue area and William Floyd Estate would incur flooding from a 100-year storm event, while the 100-year flood elevation on Fire Island includes wave run up and is 10 to 12 feet NGVD29. While site-specific topographic elevations are not available across the entire Seashore, relative impacts based on FEMA flood elevations can be predicted for comparison between alternatives.

Resource-specific context factors for assessing the impacts of the alternatives on coastal processes and floodplains include the following:

- Executive Order 11988 directs all federal agencies to avoid long- and short-term impacts associated with occupancy, modification, and development of floodplains when possible.
- NPS Director's Order 77-2 implements Executive Order 11988 and established NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding.
- Floodplain functions and values (store floodwaters, minimize erosion of adjacent soils, provide riparian habitat, etc.) are intrinsic to floodplains and cannot be easily duplicated or replaced.

- Natural features such as beaches, bluffs, dunes, and nearshore areas, and the vegetation thereon, protect coastal areas and human lives from wind and water erosion and storm-induced high water (6 NYCRR Part 505.3a)
- Littoral drift, off-shore currents, wind, inlet formation, tidal delta growth, and occasional overwash are all essential to maintain the dynamic equilibrium that sustains the barrier island.
- A key component of the Seashore's significance is that it is a barrier island system encompassing relatively unspoiled beaches, dunes, marine environments, and other natural features and dynamic processes within closer proximity to the largest concentration of population of any national seashore in the country.
- The Seashore was established "for the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features within Suffolk County, New York which possess high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban populations (P.L. 88-587)."

COASTAL PROCESSES & FLOODPLAINS

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under each of the proposed alternatives, Fire Island National Seashore would continue to work with local, county, state, and federal officials to protect, restore, and emulate the natural processes of Fire Island to the greatest degree possible, consistent with the actions agreed upon by the Department of the Interior and the USACE in the Tentative Federally Supported Plan (TFSP) for FIMP. For example, the NPS would seek to enforce CEHA and other regulations consistently throughout Fire Island and to adhere to the guidelines outlined in TFSP for FIMP. Such efforts would enhance shoreline protection by ensuring that new developments support a more uniform coastal environment. Ongoing activities such as channel dredging to facilitate water access to Seashore facilities would continue on an as-needed basis; however, a comprehensive dredge management plan would be developed to maximize opportunities to return dredged sediment to bayside sediment transport systems, thereby promoting/enhancing coastal processes, erosion buffers, and restoring coastal habitats. These actions would be accomplished in accordance with regulations administered through the state's Tidal Wetland Program (6NYCCR Part 661). In addition, one component of a shoreline management plan would be developed to promote the restoration/enhancement of degraded shorelines and associated habitats, similar to the pilot project at the Sunken Forest. These actions would be compatible with the goals of the Long Island South Shore Estuary Reserve Comprehensive Management Plan, which focuses on improving water quality and restoring natural habitats. These actions would also benefit the floodplains on Fire Island, particularly the bayside, since increased buffers and coastal habitats serve as the first line of defense against coastal storms and dampen erosional forces along Fire Island's perimeter.

Under Alternatives 2 and 3, the Seashore would encourage greater scientific and scholarly research. Specifically, NPS would develop a coordinated, comprehensive research and monitoring program to better understand and manage the broad range of natural and cultural resources within the Seashore's boundaries, particularly in the context of climate change and sea level rise. The Seashore would consider strategies for adaptive management and would work in coordination with the North Atlantic Coast Cooperative Ecosystem Studies Unit (CESU) and other appropriate CESUs within the national network, and applicable federal, state, and local agencies. Research could help identify new approaches to minimizing the effects of sea-level rise at the Seashore. In addition, as described in chapter 2, under each of the proposed alternatives, the Seashore would engage in strategies that seek to mitigate the Seashore's contributions to climate change as well as adapt to the associated changing conditions. These strategies would include educating NPS staff, its partners, and members of the communities and the general public about climate change and sea-level rise to encourage adaptive planning at a larger scale. Any future planning for Fire Island, particularly for the Seashore's cultural resources and physical infrastructure (e.g., facilities, circulation systems, utilities, etc.), would include a risk assessment and/or a scenario planning component. Sea-level rise could result in the natural development of new inlets and truncation

of cross-shore environmental gradients (NPS 2005b) as well as increase opportunities for island overwash. Although adaptive planning and mitigation techniques would reduce the potential impacts of sea-level rise and climate change on Fire Island's resources, changes to coastal landscapes such as the development of new inlets and island overwash would alter existing coastal processes and conditions within the floodplains.

Oceanside beach nourishment would continue on an as-needed basis within the residential communities, and sand by-passing (Moriches Inlet) would continue to benefit natural sand-transport processes by maintaining a local source of sand along the oceanside beaches. Beach nourishment and sand by-passing activities would help maintain the oceanside sediment budget, which in turn promotes accretionary processes such as dune building and other natural processes related to barrier island development. In addition, the current Breach Contingency Plan (BCP), that was negotiated by NPS, USACE, and NYSDEC in 1992, would remain in place until a new BCP is adopted under FIMP. Under the current BCP, inlet breaches through the barrier island would be evaluated for immediate closure to limit effects on bay tide and bay storm levels, potentially reducing the effects on the barrier island habitats, estuary, and mainland habitats, and sediment transport processes. Each breach would be evaluated as necessary, based on current science and resource conditions, to determine whether a breach of the barrier island, specifically in the Fire Island Wilderness, should be closed due to resulting effects on bay flooding and risks to properties in low-lying areas along the bay shoreline. The BCP would benefit flood zones, since unaddressed breaches could impact tide and storm levels and cause increased flooding and erosion.

Natural resource management efforts at the William Floyd Estate would include additional research on native plant and animal species, tick monitoring and management, mosquito surveillance and management, fire management planning, management of non-native invasive plants, and maintenance of the mixed habitat complex at the Estate. These efforts would have no noticeable impact on coastal processes and/or floodplains.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the cultural resource management components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Under Alternatives 2 and 3, the Seashore would work to develop a Coastal Land Use and Shoreline Management Plan that would be developed in collaboration with relevant regulatory interests associated with Fire Island, and would incorporate the tenets of the TFSP for FIMP. The plan would articulate a comprehensive strategy that emphasizes the protection of coastal resources while addressing resilience in development within the coastal zone on both federal and non-federal lands within the Seashore and responding to the climate change futures and implications presented in Appendix B and other relevant scientific research. Implementation of such a plan would ensure that developments within the coastal zone incorporate elements aimed at protecting coastal resources. Protection of coastal resources could, in turn, benefit coastal processes and floodplain by helping to ensure the existing resources are maintained at or near current conditions. Implementation of the Coastal Land Use and Shoreline Management Plan and its influence on future development and land-use projects would benefit coastal processes and floodplains by promoting greater sensitivity and minimizing impacts to those resources.

The Seashore would work with state and local agencies to ensure that CEHA on Fire Island is enforced when developments that are inconsistent with CEHA are proposed. The NPS also would undertake appropriate administrative and legislative actions to allow the federal Dune District, which is currently south of the dune

toe and below the surf zone in some locations, to be adjusted in accordance with changing conditions and, if appropriate, aligned with the CEHA line. This could provide a more consistent determination of the ocean-dune line and unified policies regarding development or replacement of damaged structures and their relationship to sensitive coastal environs.

Also under Alternatives 2 and 3, NPS would work to revise land-use regulations. The revised regulations would clearly articulate how inconsistent development proposals would be addressed on a local and/or federal level. Developments that are consistent with existing regulations and policies, such as CEHA and FIMP, are likely to have a less adverse impact on coastal processes and floodplains than those that are inconsistent, due to the support of natural processes. Similar to other land-use and development policy-related components of the alternatives, this could also facilitate more uniform policies for new development or replacement of damaged structures and their relationship to sensitive coastal environs.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

The extensive network of boardwalks, designated trails, and dune crossings on federal lands and throughout the developed communities would continue to be available to visitors under all alternatives. The availability of this pedestrian network provides a measure of protection to sensitive resource areas, thus protecting vegetation and limiting the potential for erosion. In some areas, informal social trails would continue to exist. Visitor use of these existing informal social trails, or vegetated areas outside of designated trails, could degrade existing vegetation and increase the potential for erosion, mostly through wind-blown transport processes, because the degraded vegetation exposes the sand surface to wind. The areas where informal social trails are most likely are in the undeveloped federal tracts and in the Fire Island Wilderness. Because these localized soil and vegetation disturbances would be minimal in scale, they would result in a negligible impact on coastal processes and floodplains.

Under each of the proposed alternatives, the NPS would take steps to provide visitors (and other interest groups) with information about the dynamic nature of the barrier island and the potential risks associated with owning and managing property within the coastal environment. This information could be communicated through a variety of sources including personal communication, publications, exhibits, signage, and social and digital media, and formal training and workshops. Getting this message out to the public would improve public awareness of coastal processes and floodplains and how they can be affected by human interactions. As described in the "Natural Resource Management" section above, public and educational programming related to coastal processes and floodplains would include information about climate change and sea-level rise and adaptive management techniques. Public awareness of issues related to coastal processes and floodplains could help to reduce adverse impacts from human interactions in coastal processes, such as activities that could contribute to erosion or disrupt natural sediment transport.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under each of the proposed alternatives, transportation and access to and within the Seashore would be generally consistent with current options. Ferries would continue to operate in existing channels between Fire Island and Long Island, wherein dredging activities would continue. Continued ferry access to Seashore facilities would require maintenance of those facilities, which range from

open-pile, elevated dock facilities extended into Great South Bay to more complex landside harbors and marinas that have bulkheads, groins, wave screens, and jetties. The more complex facilities modify natural sediment transport pathways along the bay shoreline, usually resulting in increased erosion along downdrift shorelines and floodplains. Comprehensive dredge and shoreline management plans would be developed for Fire Island to help offset these impacts by placing dredged sediments along the shoreline, increasing widths of protective buffers for erosion protection, and potentially restoring lost habitats. The extent to which the Seashore marinas would impact natural processes would vary by alternative depending upon the size and number of the Seashore access facilities.

Recreational off-road driving would continue to be permitted on beaches within the Seashore along designated off-road driving routes. Off-road driving disrupts the sand, compacting it within the vehicle tracks and producing localized erosion. Off-road driving regulations would remain in place to protect designated habitats, the coastal dunes, and existing vegetation. Under the regulations, no driving is allowed within 20 feet of visible beach grass at any time of year. Further, the off-road regulations have time-of-year restrictions and limitations on the total number of driving permits issued in an effort to minimize impacts to Fire Island's natural resources and processes. The Seashore would continue to closely monitor the off-road driving routes to identify and address non-conforming activities; therefore, impacts to coastal processes and floodplains would be localized and minimal.[9]

Other access would include off-road driving, a permitted activity for public utility companies, year-round and part-time residents, and essential services. As noted above, off-road driving regulations would remain in place to protect designated habitats, the coastal dunes, and existing vegetation, all of which would benefit coastal processes by maintaining natural conditions to the extent practical. Under the regulations no driving is allowed within 20 feet of visible beach grass at time of year. Further, the off-road regulations have time-of-year restrictions and limitations on the total number of driving permits issued in an effort to minimize impacts to Fire Island's natural resources and processes. Any adverse impacts to coastal processes and floodplains would be localized and would not result in noticeable changes to overall coastal processes or conditions within the floodplain.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, the NPS would consider modifying or relocating the existing Seashore Headquarters to address issues associated with its location in a high flood hazard area. By removing or mitigating for man-made structures in areas of active sediment transport processes, natural processes and pathways would be re-established. Wind, waves, and currents would be allowed to function naturally, and sediment would be transported in a natural manner.

COASTAL PROCESSES & FLOODPLAINS

IMPACTS OF ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts from natural resource management efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Additional elements proposed under Alternative 1 would include allowing in-kind replacement of existing bulkheads along the bay shoreline within the Seashore but not permitting the construction of any new bulkheads or the hardening of additional shoreline. Continued compliance with this bulk heading policy would prevent further degradation of the sediment transport processes along the bayside shoreline of Fire Island and would allow natural barrier island migration and development processes to occur and naturally respond to the effects of sea-level rise. Bulkhead replacement would protect the uplands and associated improvements from bayside erosion, but shoreline hardening typically results in adverse impacts on the overall sediment budget and natural sediment transport processes.

Other actions that would continue under this alternative would be the development and implementation of the Breach Response Plan and continued consideration of community beach management. The TFSP for FIMP generally allows for

9 Driving regulations are not included in the General Management Plan but are being addressed through a separate, ongoing negotiated rule making process not related to the alternatives considered in this document.

the closure of breaches within 90 days, except within the five major federal tracts, which will be monitored. In the event that a breach within the five major federal tracts does not close within 45 to 60 days, a Science Response Team would advise decision makers on the conditions for closure.[10] Breach repair would minimize bay flooding and coastal erosion and restore littoral transport systems. Breach management efforts, including the emergency use of sandbags, geotubes, etc., would be considered on a case-by-case basis if they meet approved regulatory and compliance requirements. These actions would result in a range of impacts from beneficial to adverse, with beach nourishment and breach closure being considered beneficial to maintaining the coastal shoreline and existing floodplain configuration. However, sandbags and geotubes, while in place, would provide temporary erosion protection to damaged dune systems, preventing natural coastal processes from occurring, but would not be considered sustainable. These structures could modify natural transport pathways and have a negative impact on floodplains and coastal processes.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

The impacts associated with the cultural resource management components of Alternative 1 would be the same as those desctibed in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from the land-use and development components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. In addition, properties within the Community Development District that are damaged or destroyed by overwash could be repaired or rebuilt in accordance with local codes and zoning standards. Although strict enforcement of the NYS CEHA is proposed, current federal zoning standards and other state and local regulations would allow some damaged or destroyed private properties within the communities to be reconstructed in high flood hazard areas, which would continue to compromise dune formation and other coastal processes. Rebuilding these structures within the flood zone also would restrict the flow of floodwaters, potentially leading to additional loss of property. In addition, the continued presence of these structures would result in an adverse impact on coastal processes, because they would continue to block natural sediment transport, thereby restricting natural coastal processes. The NPS would work closely with relevant agencies and community groups to help mitigate the loss and minimize the potential adverse impacts on coastal processes and floodplains.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from the Seashore experience, interpretation, education, and outreach components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts from the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

The elements included in this alternative would maintain existing facilities, visitation, and staffing levels at the Seashore. The continued presence of the visitor facilities would continue to interrupt coastal processes, mostly along the bayside of Fire Island, where access channels and landing facilities are maintained. However, mitigation measures would be employed to minimize adverse impacts to the littoral sediment transport processes, such as reintroducing local dredged sediments into the shoreline system. In addition, dredge material could be placed at the appropriate elevations so that wetland/ marsh systems could become established, thereby enhancing the shoreline's ability to buffer Fire Island during storm events. Routine maintenance or other operations related to the upkeep of these NPS facilities could further diminish natural coastal processes if accomplished without appropriate management plans.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact coastal processes and floodplains within the Seashore. These actions include dredging, and the New York State Coastal Zone Management Plan/ Combined Assessment and Strategy.

Routine dredging activities near the Seashore are necessary to maintain channels within the Great South Bay to accommodate ferries and other large vessels. The

10 The FIMP EIS will consider all alternatives for breach management.

Long Island Intracoastal Waterway Federal Navigation Project, which is currently being undertaken by the USACE, would aid in these efforts and facilitate the use of the Great South Bay by the U.S. Coast Guard as well as a variety of recreational and commercial vessels. Channel dredging disturbs soils on the bay floor and disrupts natural sediment transport processes. Deposition of dredged sediment above the bay shoreline also would adversely impact these resources by altering natural sediment transport processes within the bay by removing nearshore sediments from the sediment budget. As with dredging activities discussed under the "Impacts Common to All Alternatives" section above, Seashore staff would work with the USACE to maximize opportunities to return dredged sediment to bayside sediment transport systems, resulting in a beneficial impact by promoting and enhancing coastal processes, erosion buffers, and restoring coastal habitats. These actions would be accomplished in accordance with regulations administered through the state's Tidal Wetland Program (6NYCCR Part 661).

Policies associated with the New York State Coastal Zone Management Plan/ Combined Assessment and Strategy are aimed at improving coastal zones within the state and, therefore, could enhance coastal processes at the Seashore. Potential strategies included in the 2011-2016 updates to the CMP include expanding the scale at which Local Waterfront Revitalization Programs are developed to more closely align them with regional and ecosystem planning and developing a Long Island South Shore Estuary Special Area Management Plan. These initiatives correspond with many of the objectives outlined in the "Elements Common to All Alternatives" section and Alternative 1 and would contribute beneficially to coastal processes and floodplains.

The impact of these past, present, and reasonably foreseeable future actions would generally be long-term and beneficial (improved coastal management). When combining the impacts of these projects with the impacts of Alternative 1, the cumulative impact would be beneficial. Alternative 1 would contribute a beneficial increment to the cumulative impact on coastal processes and floodplains within the Seashore.

Conclusion

Overall, Alternative 1 would result in both beneficial and adverse impacts on coastal processes and floodplains. Natural resource management efforts such as enforcement of CEHA regulations, mitigation for replacement bulkheads, beach nourishment, and research and monitoring programs would result in beneficial impacts. The overall adverse impact would be mostly attributable to continued dredging to facilitate water access to Fire Island, the continued presence of hardened surfaces along the shoreline (such as bulkheads), and the continued presence of structures within the floodplain, including Seashore facilities and structures within the communities. Short-term adverse impacts would occur during bulkhead replacement and/or the implementation of emergency beach management efforts, and present land-use and development components of Alternative 1 would have some adverse impacts.

Seashore Experience components such as the continued use of trails, boardwalks, and dune crossovers would result in localized adverse impacts on coastal processes and floodplains. Similarly, the continued permitted use of ORVs would cause localized adverse impacts. Because these actions would be monitored and mitigation strategies are in place and employed as management tools, these adverse impacts would be negligible.

The cumulative impact would be long-term and beneficial, and Alternative 1 would contribute a beneficial increment to the overall adverse cumulative impact.

Beneficial impacts of actions associated with Alternative 1, as summarized above, would not be considered significant because the impacts from these continuing practices are too small to be noticeable. The

adverse impacts associated with the implementation of Alternative 1 would be negligible and highly localized. Impacts would be long-term and short-term, however mitigation measures in place will reduce the magnitude of any adverse impacts. Further, the key dynamic processes associated with the barrier island system would be minimally affected. Therefore, adverse impacts as a result of actions associated with Alternative 1 would not be considered significant.

COASTAL PROCESSES & FLOODPLAINS

IMPACTS OF ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts from the natural resource management components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Under Alternative 2, greater emphasis would be placed on the protection and restoration of natural ecological systems, patterns, and resources on federal lands. A nature-based experience would be emphasized and the overall development footprint of the Seashore would be greatly reduced. Some of the specific facilities to be removed are discussed in the following sections. Reducing the overall development footprint and level of human influence would enhance natural processes at the Seashore by allowing coastal processes to proceed uninterrupted along larger stretches of the shoreline, such as the flow of flood waters or overwash. Therefore, Alternative 2 would result in a greater beneficial impact on coastal processes and floodplains. As facilities are removed and areas are allowed to revert to natural conditions, coastal processes and floodplains could be temporarily affected due to equipment access, stockpile of demolition materials, and removal of materials from Fire Island. These actions could temporarily disturb vegetation on Fire Island and possibly along the shoreline at ingress and egress points, resulting in temporary, unstable conditions. However, mitigation techniques would be employed to restore original contours and re-establish the appropriate vegetative communities, resulting in short-term adverse impacts with a long-term beneficial impact.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

The impacts assoiated with the cultural resource management components of Alternative 2 would be the same as those described in the "impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, reversion of currently developed

federal land to natural areas could restore natural coastal processes in some areas, a beneficial impact. In addition, naturalized areas would be more effective at attenuating storm events, also resulting in a beneficial effect on the floodplains. Future developments associated with this alternative would be designed to emphasize the protection of natural resources over human development potentially reducing scale of development on Fire Island over time and enabling the restoration of natural conditions in some areas. This could have a long-term beneficial impact on coastal processes and the floodplain.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore Experience components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. However, this alternative would also include the relocation or removal of visitor facilities. In particular, modifications to the existing visitor facilities at Sailors Haven, Talisman, and the Wilderness Visitor Center could impact coastal processes and/or floodplains at Fire Island National Seashore. Facilities at Sailors Haven, for example, would be scaled back in part to allow for the restoration and regeneration of the bayside shoreline. At Talisman, the NPS would remove the restrooms, beach walk, and old hotel building at the end of their structural lifecycle. In general, removal of facilities in their entirety would enable the bayshore to return to a natural condition and provide a beneficial impact on coastal processes and floodplains. However, remaining facilities that still include navigational channels and man-made structures, such as jetties and bulkheads, would continue to influence bayside sediment transport processes, sometimes having a negative impact on coastal processes and floodplains. Lastly, the existing Wilderness Visitor Center would be removed and replaced with a smaller structure. Given the small footprint and profile of the proposed facility, it is not anticipated to have a noticeable impact on sediment transport patterns or floodplain conditions.

In addition, under this alternative, visitor access to some Seashore resources would be modified. This could include prohibiting access to some portions of the bay shoreline to facilitate naturalization. In some locations for certain periods of time, public access may be restricted to facilitate restoration of these areas to a natural state. New means of access, such as boardwalks, may be installed in sensitive areas to enable public access. Limitations on visitor access in some areas would benefit the Seashore by supporting the protection and restoration of natural resources; however, these elements would have no noticeable impact on coastal processes or flood zones. Pedestrian use of informal trails and other areas would continue to remove vegetation and increase the potential for erosion, although these disturbances would be localized and less severe than those associated with Alternative 1, because access to many resources would be restricted.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. Under Alternative 2 transportation to and within Fire Island would be generally consistent with current operations. However, this alternative would reduce the size of facilities, including the removal of the Sailors Haven Marina. Removing the outer bulkhead at Sailors Haven would provide beneficial impacts by restoring sediment transport patterns to more natural conditions, which would benefit the adjacent and downdrift shoreline abutting the Sunken Forest. However, a ferry dock and landside bulkhead would remain at this location. Beneficial impacts would occur through the reduction of the overall footprint and restoration to natural conditions, such as a tidal marsh. By reducing the overall numbers of available slips, it is likely that offshore mooring of small, recreational vessels would increase. However, the offshore moorings are not anticipated to have a measurable effect on coastal processes.

Alternative 2 would also include efforts to improve water-based access to Fire Island. As described in chapter 2, NPS would work with Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to expand opportunities for water-based facilities on Fire Island that can accommodate the movement of goods and services. Boats are already used to haul trash off Fire Island and to carry cargo and materials to the east end of Fire Island. Currently, ferries also bring cargo into the western communities on Fire Island. However, expanded water-based access for hauling could require expansion of the existing channels (i.e., dredging) and/or more frequent dredging of the existing channels to accommodate the larger hauling vessels. In addition, if these facilities were to require the development of new structures, coastal processes could be adversely

impacted if the structures were to be situated in a previously undeveloped location, which would restrict natural sediment transport. Additionally, if the facilities were constructed within existing 100- or 500-year flood zones, their presence could decrease flood storage volumes, restrict natural flow patterns, and/or exacerbate catastrophic flooding in downstream areas.

Temporary adverse impacts would occur during construction of new facilities due to the presence of temporary stockpiles of demolition materials and removal processes. However, once debris is removed off-island, natural processes could quickly re-establish coastal landforms and features within the restored areas.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. Under this alternative visitor facilities and Seashore housing facilities could be consolidated on Fire Island. Seashore housing would be removed from Talisman, and the number of housing units at Sailors Haven and Watch Hill would likely be reduced. These actions would enhance natural coastal processes and flood zones by removing man-made obstructions. Reducing the overall development footprint and enhancing natural areas would also allow coastal processes to occur uninterrupted (i.e., naturally) along larger stretches of the shoreline. By removing man-made structures, such as the Seashore housing at Talisman, Sailors Haven, and Watch Hill, from areas of active sediment transport processes, whether along the bayside shoreline or from within interior portions of Fire Island, natural processes and pathways would be re-established. This would result in a beneficial impact on coastal processes. Wind, waves, and currents would function naturally, and sediment would be transported in a natural manner. Some of the changes in coastal processes may be slightly detectable and localized, while other areas may realize larger-scale, beneficial improvements. As facilities are removed and areas are allowed to revert to natural conditions, there would be some temporary adverse impacts on coastal processes and flood zones due to construction access, temporary stockpiles of demolition materials and removal processes. However, once debris is removed off-island, natural processes would quickly re-establish coastal landforms and features within the restored areas, an overall beneficial impact.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact coastal processes and flood zones within the Seashore. These actions include dredging and the New York State Coastal Zone Management Plan/ Combined Assessment and Strategy as described under Alternative 1. The impact of these past, present, and reasonably foreseeable future actions would generally be long-term and beneficial due to improved coastal management. When combining the impacts of these projects with the impacts of Alternative 2, the cumulative impact would be long-term beneficial. Alternative 2 would contribute appreciably to the cumulative impact on coastal processes and flood zones within the Seashore.

Conclusion

Although some components of Alternative 2 would result in minor adverse impacts on coastal processes and flood zones, the overall impact would be beneficial. Natural resources management efforts would focus on enhancement and restoration of natural processes, including coastal processes. Efforts such as enforcement of CEHA regulations, reductions in the overall development footprint, continued mitigation for hardened shorelines, and providing beach nourishment would enhance natural coastal processes. The land-use and development elements of Alternative 2 could benefit coastal processes and flood zones once a Coastal Land Use and Shoreline Management Plan is developed and implemented.

Overall, Seashore Experience components of Alternative 2 would result in beneficial impacts on coastal processes related to removal of some of the existing visitor facilities from the Seashore. Adverse impacts associated with visitor activities such as camping, ORV use, and use of the existing trails, would be generally negligible and would be less than in Alternatives 1 and 3, because visitor access would be restricted in some areas, decreasing visitor use. Transportation components such as ferry service to and from Fire Island would continue to require routine dredging, resulting in a range of adverse

impacts to coastal processes and floodplains. However, by removing the Sailors Haven facility and restoring much of the area to natural conditions, a notable beneficial impact would occur to coastal processes and floodplains, as natural sediment transport processes are restored and the impediments to the flow of floodwaters are removed.

The removal of selected existing facilities over time as proposed in this alternative would allow coastal processes to proceed uninterrupted along larger areas of the affected federal tracts, thereby benefiting coastal processes and floodplains. There would be some adverse impacts associated with the removal and/or replacement of existing facilities and vegetation and excavation of submerged soils during archeological investigations. These activities could temporarily disrupt coastal processes; however, the adverse impacts would be minimal because the impacts would only last a short period of time and conditions would be restored upon completion of each activity. The cumulative impact would be beneficial over the long term, and Alternative 2 would contribute an appreciable beneficial increment to the overall beneficial cumulative impact.

Beneficial impacts of actions associated with Alternative 2, as summarized above, would be considered significant because, although localized, they would result in notably improved conditions within the context of the barrier island system. Adverse impacts associated with the implementation of Alternative 2 would be short term, highly localized, and negligible in scale. Mitigation measures would reduce the magnitude and any adverse impacts. The key dynamic processes associated with the barrier island system would be minimally affected. As a result, these adverse impacts would not be considered significant.

COASTAL PROCESSES & FLOODPLAINS

IMPACTS OF ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under Alternative 3, the NPS would place greater emphasis on research, documentation, interpretation, and preservation of cultural resources on Fire Island. Temporary disturbances to vegetation and sandy areas could occur as documentation projects are advanced, but measures would be employed to minimize ground disturbances and return disturbed areas to pre-existing conditions. The existing curatorial facility at the William Floyd Estate would be expanded by approximately 1,000 square feet. However, this element would have no noticeable impact on coastal processes or floodplains, as the facility would not be located within the 100- or 500-year flood zone. Impacts to coastal processes would likely be negligible given the small size of the building expansion, but more importantly, the location would not be within an area of dynamic sediment transport processes. Furthermore, floodplain impacts would be highly localized and only slightly detectable.

▸ IMPACTS RELATED TO LAND USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be the same as those described in Alternative 2.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from the Seashore experience, interpretation, education, and outreach components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, visitation to Fire Island National Seashore would be maintained at least at current levels. Ferry traffic and visitor use of trails, boardwalks, buildings, and dune crossovers would be generally consistent with current conditions. The total number of backcountry camping permits issued by the Seashore could increase; however, it is not anticipated that this increase would noticeably affect coastal processes or floodplains within the Seashore.

Under Alternative 3, the NPS would also explore options for redesigning the Sailors Haven marina and ferry dock to minimize the down-drift impacts that have been causing erosion and undermining portions of the Sunken Forest. If such elements are implemented in Sailors Haven, natural coastal processes would become more prevalent as human-induced erosion and undermining is reduced, further protecting the Sunken Forest.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts from the transportation and access components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. Under Alternative 3 transportation to and on Fire Island would be generally consistent with current options. If ferry service to Fire Island is improved under Alternative 3 to expand service during the shoulder seasons, dredging could be required more often, resulting in an incrementally adverse impact on coastal processes compared to the other alternatives. However, as described in the "Impacts Common to All Alternatives" section, comprehensive dredge and shoreline management plans would be developed to identify strategies that would help offset impacts associated with dredging by placing dredged sediments along the shoreline, increasing widths of protective buffers for erosion protection, and potentially restoring lost habitats.

Like Alternative 2, this alternative would also include efforts to improve water-based access to Fire Island, which could result in increased dredging and/or development within the existing 100-year flood zone. More frequent dredging would increase adverse impacts to natural coastal processes and development within high-hazard flood zones could decrease flood storage volumes, restrict natural flow patterns, and/or exacerbate catastrophic flooding in downstream areas. Again, implementation of the dredge and shoreline management plans would help mitigate and minimize potential adverse impacts.

Temporary adverse impacts would occur during construction of new facilities due to the presence of temporary stockpiles of demolition materials and removal processes. However, once debris is removed off-island, natural conditions would be restored, an overall beneficial impact on coastal processes and floodplains.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from the Seashore operations, maintenance, and facilities components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above.

Under Alternative 3, the NPS would also remove the housing unit at Talisman from in front of the CEHA line. If feasible, this structure would be relocated in a more appropriate location. This would result in a negligible beneficial impact on coastal processes and floodplains, as the flow of flood waters and overwash is only minimally restricted under current conditions.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact coastal processes and floodplains within the Seashore. These actions include dredging and the New York State Coastal Zone Management Plan changes as described under Alternative 1. The impact of these past, present, and reasonably foreseeable future actions would generally be long-term and beneficial (i.e., improved coastal management). When combining the impacts of these projects with the impacts of Alternative 3, the cumulative impact would be long-term beneficial. Alternative 3 would contribute appreciably to the cumulative beneficial impact on coastal processes and floodplains within the Seashore.

Conclusion

Although some components of Alternative 3 would result in some adverse impacts on coastal processes and floodplains, the overall impact would be beneficial.

Natural resource management efforts such as enforcement of CEHA regulations, beach nourishment, sediment by-pass, erosion control, and restoration of natural coastal processes would result in beneficial impacts on coastal processes and floodplains. Other cultural components like the expansion of the existing curatorial facility, which is located outside the existing 100- and 500-year flood zones, would have no noticeable impact on coastal processes or floodplains.

As in Alternative 2, the land use-and development elements of Alternative 3 could benefit coastal processes and floodplains if a Coastal Land Use and Shoreline Management Plan is developed and implemented.

Seashore Experience components of Alternative 3 would result in beneficial impacts on coastal processes related to removal of some of the existing visitor facilities from Fire Island National Seashore. The benefits would be incrementally less than those associated with Alternative 2 because fewer facilities would be removed. Adverse impacts associated with continued visitor activities such as camping (which could increase), ORV use, and use of the existing trails, would be generally negligible.

Transportation components such as ferry service to/from Fire Island would continue to require routine dredging, resulting in a range of adverse impacts to coastal processes and floodplains. If dredging activities increase under this alternative as a result of ferry service improvements and/or improvements to water-based access to Fire Island, the impacts to coastal processes from dredging would be adverse. In addition, adverse impacts to floodplains could be greater compared to the other alternatives if new facilities are constructed, in previously undeveloped areas to support water-based access improvements.

Adverse impacts associated with this alternative would be related to the removal and/or replacement of existing facilities and vegetation and excavation of submerged soils during archeological investigations. These activities could temporarily disrupt coastal processes; however, the impacts would last only a short period of time and conditions would be restored upon completion of each activity. The cumulative impact would be long-term and adverse, and Alternative 3 would contribute a noticeable beneficial increment to the overall adverse cumulative impact.

Beneficial impacts of actions associated with Alternative 3, as summarized above, would be considered significant because although localized, they would result in notably improved conditions, within the context of the barrier island system. Adverse impacts associated with the implementation of Alternative 3 would be short term, highly localized, and negligible in scale. Mitigation measures would reduce the magnitude and any adverse impacts. The key dynamic processes associated with the barrier island system would be minimally affected. As a result, these adverse impacts would not be considered significant.

NATURAL RESOURCES

Impacts on Water Resources

Methodology

The impact analysis for water resources assumes that actions conducted under each alternative would adhere to applicable federal, state, and local laws and policies including:

- Clean Water Act
- Executive Order 11990: Protection of Wetlands
- Executive Order 13158: Marine Protected Areas
- Executive Order 13547: National Ocean Policy
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- New York State Department of Environmental Conservation Tidal Wetlands Regulations (Article 25 of the Environmental Conservation Law)
- NPS Procedural Manual 77-1: Wetlands Protection
- Suffolk County Vector Control and Wetlands Management Long-Term Plan
- Suffolk County Department of Health Services Wastewater Management Requirements

In this section the analysis of impacts on water resources includes the impacts on those resources dependent on a certain quality or condition of the water, such as vegetation and wildlife. *The NPS Management Policies 2006* state that the NPS 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."

This analysis also includes a general discussion of wetlands and water quality conditions. Wetlands are "lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface" (USFWS 1979). Mapped locations of wetlands were compared with locations of proposed developments and modifications of existing facilities. Predictions about

short- and long-term site impacts were based on previous studies of impacts to wetlands from similar projects and recent scientific data.

Sensitive marine organisms, submerged aquatic vegetation, riparian areas, and wetlands are all affected by changes in water quality from direct and indirect sources. Overall, the NPS based these impact analyses and conclusions on the review of existing literature and studies of the Seashore, information provided by experts within the Seashore and other agencies, and professional judgments.

Resource-specific context factors for assessing the impacts of the alternatives on water resources include:

- Water resources affect the quality and availability of water-based recreation (e.g., swimming, fishing).
- Executive Order 11990 directs the NPS to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.
- NPS Director's Order 77-1 adopts a goal of "no net loss of wetlands"; in addition, the NPS will strive to achieve a longer-term goal of net gain of wetlands.
- Wetlands have unique functions and values (groundwater recharge; stormwater storage and discharge; unique habitats; etc.) that are intrinsic to wetlands and cannot be easily duplicated or replaced.

WATER RESOURCES

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under Alternatives 2 and 3, the NPS would implement a comprehensive research and monitoring program to better understand the natural resources within the Seashore, which would include water resources within the terrestrial and marine ecosystems. Building on this program, the NPS would promote cooperative stewardship of the resources with members of the public (both visitors and community residents), Seashore stakeholders, and other landowners/agencies to better protect and manage water resources. These efforts would result in a long-term beneficial impact, improving water resource conditions (both terrestrial and marine) throughout the Seashore.

The NPS would continue ongoing natural resource management programs and projects that may affect water resources, such as vegetation restoration and protection, mosquito and tick management, shoreline and beach protection, and bayside wetlands protection. Resulting human intervention in natural processes, when necessary, could have both adverse and beneficial impacts on water resources. In particular, vegetation, insect, and wildlife management, including mosquito and tick management, beach nourishment in front of the communities, and efforts to restore native plant species could adversely affect water quality if chemical or mechanical methods are used. For example, herbicides and associated chemicals used to remove invasive species from the Seashore in an effort to restore native plant species could migrate to ground or surface waters, affecting water quality and aquatic habitat for fish, shellfish, and benthic fauna. Additionally, mechanical actions could result in localized disturbances, affecting water quality from soil erosion. As these plans are developed and implemented, the NPS would work to minimize erosion, and the use of chemicals in insect management would be limited to situations where human health and safety is at risk.

Ongoing natural resource management programs under Alternatives 2 and 3 would also benefit water resources. Recent NPS initiatives call for enhanced marine resources stewardship. Efforts proposed under Alternatives 2 and 3 reflect those initiatives and would include both research and monitoring of marine resources, including fin and shellfish populations in the Great South Bay and Atlantic Ocean, and the development of a marine resources management plan. Under all alternatives, the Seashore would take steps to monitor and protect both wetlands and marshes (freshwater and saltwater), which would benefit these resources over the long term.

One of the water quality concerns of Great South Bay is the number of individual on-site septic disposal and cesspool systems on Fire Island. Wastewater discharges from these underground systems are allowed to flow directly into the water table, causing elevated levels of nutrients, pathogens, and organic compounds that can eventually leach into surface waters of the back bay estuaries. Such elevated levels of nutrients can increase phytoplankton and macroalgae populations resulting in negative impacts to water quality and fisheries habitat (Schubert et al. 2010). Under Alternatives 2 and 3, the NPS would collaborate in efforts to evaluate and address wastewater management on Fire Island (including federal and nonfederal lands) and leaching of nutrients into the bay causing habitat degradation for marine life. Such efforts would lead to improved water quality conditions within the Seashore and adjoining marine waters, a long-term beneficial impact.

Seashore efforts to manage, protect, or restore coastal processes, such as routine dredging of existing ferry channels in the bay, could temporarily reduce water quality by increasing the disturbances to marine resources and turbidity. In addition, sea-level rise could introduce multiple physical and chemical impacts to the area's water resources. In particular, increases in the sea level would increase the water table elevation to reach individual underground cesspools and septic systems, affecting their treatment performance and increasing nutrient loads (McElroy et al. 2007). Additionally, sea-level rise would elevate tidal and wave pumping action, potentially increasing the level of saltwater intrusion into the island's groundwater, and existing wetlands would become inundated, affecting the estuaries' ability to filter pollutants seeping from the groundwater system (USGS 2004). Increase in average annual temperature (increase of 3 to 5 degrees in the 2050s) would also contribute to the physical and chemical changes to water resources (Rosenzweig et al, 2011. See Appendix B).The Seashore would take steps to monitor the marshes and groundwater, establish baselines, and assess changes resulting from potential sea-level rise. Based on

monitoring results, measures would be implemented to adapt to change and minimize the adverse effects of sea-level rise.

▸ IMPACTS RELATED TO CULTURAL RESOURCES MANAGEMENT ACTIONS

Under all alternatives, Seashore efforts to identify, manage, and protect submerged archeological resources would continue. These efforts would not noticeably affect water resources conditions.

▸ IMPACTS RELATED TO LAND USE AND DEVELOPMENT ACTIONS

Under all alternatives, the Seashore would collaborate with others through public outreach to emphasize the unique nature of living in the coastal environment. The Seashore would continue to implement the 1984 Land Protection Plan, which calls for the acquisition of improved properties within the Seashore District on a willing-seller basis as they become available. In most cases, as properties are acquired, structures would be removed and the land would revert to a natural state.

Under Alternatives 2 and 3, the Seashore would model 'best practices' in undertaking projects potentially affecting water quality. Examples of such practices include waste management, marina maintenance and dredging, or other similar actions.

These efforts would result in beneficial impacts on water quality as properties are acquired by the Seashore. Removal of existing structures would eliminate a nonpoint source of pollution and runoff within the Seashore, as well as reduce pollutant loads into the groundwater resulting from on-site septic system operation. Non-point sources of pollution are those that do not originate from pipes or other conduits; examples might include a puddle of motor oil or garden fertilizer being washed into groundwater or a creek.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under each of the alternatives, the Seashore would seek to broaden the diversity and geographic origin of visitors to Fire Island. These efforts may result in an increase in annual visitation with attendant increases in visitor needs for potable water, as well as increases in solid waste and wastewater disposal. Increases in visitor use could also result in changes to the number of private boats at the Seashore. Impacts associated with private boats and modes of access are described below in the "Transportation and Access" section. The continued operation and use of marinas and comfort stations would continue to reduce surface and groundwater quality within the Seashore due to the potential for a release of pollutants. However, the Seashore would subscribe to NOAA's Clean Marinas guidelines and would encourage other public and private marinas on Fire Island to do the same. As such, adverse impacts associated with the marinas would be minimal. The implementation of stricter policies could have an overall beneficial impact on water quality near the marinas. The high intensity use of the beaches, coupled with the aging onsite septic system that services those beaches results in increased opportunity for adverse impacts to water quality from wastewater. If the existing systems were to be updated by the Seashore, adverse impacts to water resources would be reduced.

Continued ORV use within the Seashore also would have the potential to continue to impact water resources where ORVs are allowed to travel along established vehicular courses bisecting wetland dunal swales and other surface water ecosystems. This would not only have direct impacts on the wetlands and any associated vegetation, but also could result in petroleum pollutants entering these systems. By continuing to strictly enforce rules for driving on the beach, the potential for these adverse impacts would be minimized.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under each of the proposed alternatives, water quality and other water resources within the bay, such as aquatic life and vegetation, would continue to be impacted by the presence and operation of boats, including ferries and private vessels. Specifically, the continued operation of private boats, private water taxis, and ferries would emit petroleum products into the water column and/or cause sediment disturbances in shallow waters in the bay from propeller contact with the aquatic bottom. By working with cooperators to make ferry operations sustainable (such as using alternative fuel sources), these adverse impacts could be greatly minimized.

Continued ORV use within the Seashore also would have the potential to continue to impact water resources where ORVs are allowed to travel along established vehicular courses bisecting wetland dunal swales and

other surface water ecosystems. This would not only have direct impacts on the wetlands and any associated vegetation, but also could result in petroleum pollutants entering these systems. By continuing to strictly enforce rules for driving on the beach, the potential for these adverse impacts would be minimized.

The Seashore would work with the communities, county, state, and others to keep driving to a minimum. However, land-based vehicular access would continue to alter the physical condition of surface waters such as intermittent ponded depressions. Vehicular access to the Seashore, at current levels, would continue to result in nonpoint source pollution from vehicles and impacts to ponded areas where vehicles travel through depressions and swales that fall within travel corridors, thus having a long-term, minimal, adverse impact.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, infrastructure would be replaced/rehabilitated to a lesser degree than under the action alternatives. Replacements would only occur as needed, and as funding becomes available. Many of the Seashore's existing buildings were not designed as sustainable structures; therefore do not include elements to address, for example, runoff treatment and stormwater management, which would benefit water quality. The Seashore Headquarters and Patchogue Maintenance Facility would be updated, and where necessary, these facilities would be rehabilitated to address environmental concerns such as improvements to storm water drainage and increased energy efficiency. Improvements to these structures would enhance the benefits to water resources by better managing runoff and upgrading wastewater treatment facilities. Building construction and modification activities associated with this alternative could result in temporary impacts to water quality due to the soil disturbances from construction equipment and vehicles. The Seashore would ensure steps are taken to minimize impacts to surface and ground waters through silt fencing and other best management practices for water quality.

WATER RESOURCES

IMPACTS OF ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts from natural resource management efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Continued recreational fin and shellfishing would be permitted within the Seashore with the expectation that activity levels would be near current levels, although management and regulatory steps could be taken to modify future activity levels. This alternative would continue to reduce the number of aquatic organisms in the bay due to fishing and shellfishing, and would continue to increase the potential for pollution from recreational fishermen using motorized boats. Shellfishing, in particular, would result in a reduction of the filter feeding functions provided by shellfish which are important to the enhancement of water quality of Great South Bay. Recreational fishing would be monitored to ensure fish and shellfish population stability.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

The impact of cultural resource management efforts on water resources associated with Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from the land use and development components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Bay side bulkheads and docks may introduce instability to the shoreline causing erosion and sediment suspension in the water column. In addition, properties damaged or destroyed by overwash would continue to be allowed to be repaired or rebuilt after storm events. If rebuilt in-kind, some of these structures could contribute to nonpoint source pollution and runoff within the Seashore. However, if design measures are taken to manage nonpoint source pollution and runoff on these properties, water quality could be improved over current conditions.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from the Seashore experience, interpretation, education, and outreach components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, as funding becomes available existing Seashore facilities, including the Sailors Haven Visitor Center and the Carrington Estate, would be rehabilitated for visitor and administrative use, respectively. Depending on the nature and scale of construction activities or maintenance, water resources could be disturbed through soil disturbance or runoff. The Seashore would take the appropriate steps to minimize or mitigate runoff associated with construction activity and to prevent spills and/or migration of oil or hazardous materials resulting from operation of construction equipment.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

The impact of transportation and access components of Alternative 1 on water resources would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Routine operations and maintenance activities could impact water resources if activities release pollutants into neighboring surface waters from accidental spills. Disturbances at the existing maintenance facilities and trash transfer station/water management facility would be of particular concern.

The Seashore would maintain existing work and patrol boats under this alternative. The fleet storage area and maintenance area allows for existing runoff to reach Patchogue River and eventually the Great South Bay. Normal operation of these vessels would continue to reduce water quality around the Seashore via inadvertent petroleum discharges/spills from refueling and contribution to runoff from impervious surfaces of the storage and maintenance area. The NPS would use best management practices to help minimize the minor adverse impacts on water quality.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact water resources within the Seashore. These actions include the Great South Bay Clam Restoration Project, the Brookhaven 2030 Plan, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, and the Village of Patchogue Local Waterfront Revitalization Program and Harbor Management Plan.

The Great South Bay Clam Restoration Project would reestablish and protect hard clam populations within the bay, therefore, enhancing a marine resource. In addition, an increase in the clam population would benefit water quality within the bay because clams are filter feeders, which allows them to absorb and sequester nutrients, as well as remove suspended solids from the water column, a long-term beneficial impact.

Although the Brookhaven 2030 Plan would consider social, economic, and environmental factors holistically, new development could contribute to nonpoint source pollution and runoff. However, it is likely that the proposed development would be designed to incorporate measures to minimize adverse impacts on water resources, such as storm water management techniques. Overall, the plan would include both long-term minor adverse and long-term beneficial impacts on water resources.

Policies associated with the New York State Coastal Zone Management Plan changes are aimed at improving the state's coastal zones and the associated resources, including wetlands, marine debris, and aquaculture. Many of the strategies proposed in the 2011-2016 assessment would benefit water resources such as establishing a direct permit program for activities within State-designated Significant Coastal Fish and Wildlife Habitats (including Great South Bay East, Great South Bay West, and Smith Point County Park) and updating the NYS coastal policies to explicitly address marine debris and resource impacts. Implementing the plan would result in a long-term beneficial impact on water resources.

The Long Island South Shore Estuary Reserve Comprehensive Management Plan provides the foundation for the long-term health of the Reserve's bays, tributaries, tidal wetlands, wildlife, tourism, and economy and supports a variety of associated projects. Proposed

projects include improvements and maintenance of water quality and the protection and restoration of living resources, both of which would enhance water resources.

The goal of the Suffolk County Vector Control and Wetlands Management Long-Term Plan is to develop an effective long-term vector control program including a comprehensive wetlands management component. To control mosquitoes, the plan proposes to implement a variety of techniques such as integrated pest management, which would include the use of increased surveillance, operational improvements, and expanded public education and outreach (Suffolk County 2006). The plan specifically calls for "the establishment of additional mosquito traps at Fire Island National Seashore" (Suffolk County 2006). If vector control methods within the Seashore were also to include the use of pesticides, the quality of water resources (specifically ground and surface water) could be adversely affected. Wetland management would also be an important component of the overall pest management and would reduce the need for larvicides (which currently is used in the county for mosquito control). Wetland management associated with this plan would initially include low-impact elements such as culvert replacement to restore tidal circulation and improvement to fish habitat without significant changes to the wetlands (Suffolk County 2006). Implementing the plan would result in long-term beneficial and long-term minor adverse impacts to water quality.

The Village of Patchogue Local Waterfront Revitalization Program and Harbor Management Plan for its coastal areas, supports the village's Riverwalk revitalization effort, including proposed land and water uses and projects. Similar to the Brookhaven 2030 Plan, new development associated with the revitalization efforts could contribute to nonpoint source pollution and runoff. As stated in relation to the Brookhaven 2030 Plan, it is likely that the proposed development would be designed to incorporate measures to minimize adverse impacts on water resources. Overall, the plan would include both long-term minor adverse and long-term beneficial impacts on water resources.

These past, present, and reasonably foreseeable future actions would result in both long-term beneficial impacts and long-term minor adverse impacts on water resources at the Seashore. When combining the impact of past, present, and reasonably foreseeable future actions with the impacts of Alternative 1, an adverse cumulative impact would result. Alternative 1 would contribute an adverse increment to the overall adverse impact.

Conclusion

Alternative 1 would result in both adverse and benefical impacts on water resources. In general, natural resource management elements of Alternative 1 would result in adverse impacts due to continued shellfishing and fin fishing within the bay, routine dredging, and the use of chemical treatments to manage vegetation, insect, and wildlife populations (such as herbicides and insecticides). In addition, transportation components of this alternative such as personal vehicle use and continuation of current levels of use of marinas, private boats, water taxis, and ferries, to access the Seashore would continue to adversely impact water resources, including surface waters and marine life. Routine operations and maintenance activities also could have a temporary adverse impact on water resources, depending on the nature and location of the action. The adverse impacts of Alternative 1 also contribute an adverse increment to overall adverse cumulative impacts when combined with the adverse impacts of other past, present, and reasonably foreseeable actions that affect water resources.

On the other hand, improvements to make facilities more sustainable, the use of alternative fuels for ferries and patrol boats, "greening" the marinas, increased research and monitoring efforts, and cooperative stewardship of the resources would result in a long-term beneficial impact on water resources, which would help to offset some of the adverse impacts.

The cumulative impact would be long-term moderate adverse, and Alternative 1 would contribute an appreciable adverse increment to the overall adverse cumulative impact.

Adverse impacts on water quality would be readily apparent; however, the Seashore would continue to implement best management practices so that water quality conditions would not be degraded below relevant standards. In addition, no wetland resources would be lost, and wetlands functions and values would be minimally affected. Therefore, the adverse impacts would not be considered significant.

Impacts to water resources as a result of actions associated with Alternative 1 would also be long-term and beneficial because of on-going and proposed implementation of best management practices. However,

when considered within the context of the overall quality of water resources throughout the Seashore, these beneficial impacts would not be considered significant.

WATER RESOURCES

IMPACTS OF ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Natural resource management efforts associated with Alternative 2 would include the components described in the "Impacts Common to All Alternatives" section above. The Seashore would increase monitoring of recreational fishing within the Seashore to evaluate impacts on the fish populations and the general marine environment. The enforcement of these restrictions and improved monitoring would result in beneficial impacts to water resources including aquatic life. Monitoring efforts could identify other potential enhancements that could be implemented in the future, resulting in further benefits to water resources. In addition, such efforts could increase the shellfish population within the bay, further enhancing water quality. In particular, an increase in the bivalve shellfish population, as filter feeders, would increase the removal of sediments and nutrients from the water column, thus improving water quality.

Efforts to restore maritime forests within the Seashore (outside of the effort at Sunken Forest, which is described in the "Impacts Common to All Alternatives") would improve water quality conditions and minimize runoff within these localized ecosystems, a long-term beneficial impact.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

The impact of cultural resource management efforts on water resources associated with Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with land use and development would be consistent with those described in the "Impacts Common to All Alternatives" section. Removal of existing structures would reduce nonpoint source pollution and runoff within the Seashore. In addition, the emphasis on natural resources would promote the restoration of native vegetation, once facilities have been removed. Restored native vegetation could serve as riparian buffer, improve water quality in area wetlands, marshes, and open water, and help absorb energy from coastal storm events. As is common to all alternatives, other NPS structures would be evaluated and upgraded in concert with recurrent maintenance efforts over time to address elements such as stormwater management, wastewater treatment, water conservation, and risks related to climate change and sea-level rise, all of which would enhance the quality of water resources at Fire Island National Seashore.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore Experience components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. However, under Alternative 2 the impacts would be less adverse than under the other alternatives because some infrastructure (including some restroom facilities at Sailors Haven and Talisman) would be removed or down-sized, reducing these potential sources of surface and groundwater contamination. In addition, the campground at Watch Hill would be relocated to a more suitable, less sensitive area. The existing campground facility is located between primary dunes on the ocean side and a tidal estuary on the bay side. Relocating the campground to a less sensitive area would provide more buffering distance from the estuary, reducing the risk of water quality impacts. The area of the existing campground would be allowed to revegetate into a natural ecosystem, providing a naturalized riparian buffer to the estuary.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

The impact of transportation and access components of Alternative 2 on water resources would be similar to those described in the "Impacts Common to All Alternatives" section above. In addition, this alternative would eliminate the marina at Sailors Haven. Boat usage within

the marinas often causes concentrated discharges of oil/petroleum from boat motors and accidental/intentional littering of human refuse (cups, cans, plastics, bottles, etc.). By shifting the concentration of boat slips within the Seashore from Sailors Haven to Watch Hill, a reduction in nearshore impacts on water quality would occur at Sailors Haven. Also elimination of the Sailors Haven marina could increase the number of boats that moor offshore resulting in boats being placed in undredged, shallow waters where propeller scarring of the bay bottom could cause negative impacts to water quality and possibly to subaquatic vegetation. Additionally, anchors from the moored boats would continue to disturb the bay bottom, resulting in increased turbidity if the number of boats increases.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Seashore operations, maintenance, and facilities components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. However, under Alternative 2, many of the existing structures would be removed or consolidated. For example, the Seashore Headquarters and mainland maintenance facility could be consolidated into one location. However, the use of construction vehicles and associated equipment to rehabilitate or remove existing structures on Fire Island could temporarily increase the potential for groundwater and surface water contamination from petroleum products. Demolition activities associated with removal of the existing structures also could temporarily increase the potential for soil erosion from the presence of construction equipment and vehicles, which would briefly reduce water quality in that area. However, the Seashore would employ best management practices for sediment control to minimize impacts to surface and ground waters.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact water resources within the Seashore. These actions include the Great South Bay Clam Restoration Project, the Brookhaven 2030 Plan, changes to the New York State CZM policies, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, and the Village of Patchogue Local Waterfront Revitalization Program and Harbor Management Plan. These past, present, and reasonably foreseeable future actions would result in long-term minor adverse impacts and long-term beneficial impacts on water resources at the Seashore. When combined with the impacts of Alternative 2, the overall cumulative impact would be beneficial, with Alternative 2 contributing an appreciable beneficial increment to the overall cumulative impact.

Conclusion

Alternative 2 would focus on the removal of many existing structures and the subsequent restoration of natural conditions. Overall, Alternative 2 would result in a long-term beneficial impact on water resources. Specifically, the removal of existing facilities would enhance water quality by eliminating a source of pollutants and disturbance from boats near the coastline. Boats that have previously docked at Sailors Haven (removed) may be required to moor offshore. This would increase turbidity near the moorings, but overall, would benefit water resources. In addition, the removal or reduction of some facilities such as the restrooms at Talisman and the relocation of the campground at Watch Hill would result in an overall benefit to surface and groundwater. The monitoring and enforcement of recreational fishing restrictions also would benefit aquatic life through the protection from overfishing and improvement of water quality through a reduction in boat-related pollutants from fuel spills and littering. Construction activities, including the presence of construction vehicles and equipment, could have a temporary adverse impact on water resources depending on the nature and location of the action. The cumulative impact would be long-term beneficial, and Alternative 2 would contribute an

appreciable beneficial increment to the overall beneficial cumulative impact.

The beneficial impacts on water quality would be readily apparent due to increased monitoring and enforcement of recreational fishing, the removal of structures, reduction in non-point source pollution, revegetation of previously developed areas, and reduced potential for groundwater contamination. Although these benefits would be long term in duration, beneficial impacts as a result of Alternative 2 would not likely significantly affect the overall quality of water resources at the Seashore.

Alternative 2 would also have some adverse impacts. Water-based recreation activities could continue and reducing the number of marinas could potentially increase adverse impacts to water quality by potentially increasing the number of boats mooring offshore. Temporary adverse impacts to water quality from operations related to the removal of some structures could also occur. However, water quality conditions would not be degraded below relevant standards. In addition, no wetland sources would be lost, and wetland functions and values would be minimally affected. Therefore, due to the simultaneous implementation of best management practices and continued actions related to management policies protecting water resources, and within the context of the overall quality of water resources throughout the Seashore, these impacts would not be considered significant.

WATER RESOURCES

IMPACTS OF ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Natural resource management efforts associated with Alternative 3 would include the elements described in the "Impacts Common to All Alternatives" section. Continued shellfishing could reduce the quantity of shellfish in the bay. Shellfish are filter feeders and remove nutrients and suspended particles from the water column during feeding, which has the potential to reduce turbidity and increase light penetration. Deeper light penetration through the water column has the potential to expand the range over which submerged aquatic vegetation can live on the bottom substrate. However, bay-wide restoration efforts, if implemented properly, could minimize adverse impacts and would have a beneficial impact on water resources as a whole.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

The impact of cultural resource management efforts on water resources associated with Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND USE AND DEVELOPMENT ACTIONS

Land-use and development efforts associated with Alternative 3 would include the elements described in the "Impacts Common to All Alternatives" section. Similar to Alternative 2, this alternative would seek to instill new zoning standards, sustainable building designs, and stormwater management options that would result in beneficial impacts to water resources, especially water quality.

As described in the "Impacts Common to All Alternatives section," potential land acquisitions to support the restoration of natural resources also would help to enhance water quality within the Seashore, because land acquisitions would be followed by the removal of any existing structures, thereby removing those sources of nonpoint source pollution and runoff.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts to water resources associated with the Seashore experience component of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

The impact of the transportation and access components of Alternative 3 on water resources would be similar to those described in the "Impacts Common to All Alternatives" section above. In addition, the Seashore would encourage a transition from vehicle-based hauling to water-based hauling. Although this could reduce vehicles on Fire Island and the associated pollutants on land, boat use would increase. Similar to ferries and private boats, watercraft vehicles used to haul materials

to/from Fire Island would contribute petroleum products to the water column and/or cause sediment disturbances in shallow waters from propeller blades and currents. Alternative 3 could also include expanded ferry and lateral water taxi services which would result in more boat traffic in the bay. This could increase the impact to water quality from sediment disturbances and petroleum spills that could adversely affect habitat for aquatic life and aquatic vegetation.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Seashore operations, maintenance, and facilities components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. Construction activities could result in temporary sediment disturbances and would increase the potential for petroleum spills from the presence of construction equipment and vehicles. However, the Seashore would implement best management practices to minimize impacts to surface and ground waters, such as sediment control measures.

Under this alternative, the Seashore would continue to operate their existing fleet of work and patrol boats, which would continue to have the potential to release petroleum products into the bay, increase turbidity, and disturb marine resources. Because no additions to the Seashore's fleet are proposed, this component of Alternative 3 would have no noticeable impact on water resources compared to current conditions.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact water resources within the Seashore. These actions include the Great South Bay Clam Restoration Project, the Brookhaven 2030 Plan, changes to the New York State CZM policies, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, and the Village of Patchogue Local Waterfront Revitalization Program and Harbor Management Plan. These past, present, and reasonably foreseeable future actions would result in long-term beneficial impacts and long-term minor adverse impacts on water resources at the Seashore. When combining the impact of past, present, and reasonably foreseeable future actions with the impacts of Alternative 3, a long-term minor adverse cumulative impact would result. Alternative 3 would contribute a noticeable adverse increment to the overall adverse impact.

Conclusion

Like the other alternatives, impacts on water resources associated with the individual components of Alternative 3 would range from beneficial to adverse. Many of the impacts would be similar to those described for Alternative 1. Natural resource management elements of Alternative 3 would result in both beneficial and adverse impacts. Adverse impacts could result from shellfishing and fin fishing within the bay; routine dredging; and the use of chemical treatments to manage vegetation, insect, and wildlife populations (such as herbicides and insecticides). Transportation components of this alternative such as personal vehicle use and the continued use of private boats, water taxis, and ferries, to access the Seashore would continue to adversely impact water resources, including surface waters and marine life. In the short-term, cultural resource management efforts could result in temporary adverse impacts to water resources during investigations of submerged resources. Routine operations and maintenance activities also could have a temporary adverse impact on water resources depending on the nature and location of the action. The adverse impacts associated with Alternative 3 would not be considered significant because the reduction in water quality would be minimal and in most cases, would last only a short amount of time.

Benefits to water resources result from efforts to restore the bay and human intervention (such as that related to the removal of structures on acquired properties) to restore natural resources and processes. Additionally, as part of Alternative 3, water-resource-design improvements would be made to existing facilities that would benefit water resources. Beneficial impacts to water resources from Alternative 3 would not be considered significant because, in the context of the overall quality of water resources throughout the Seashore, impacts would not be noticeable.

NATURAL RESOURCES

Impacts on Vegetation

Methodology

The impact analysis for vegetation assumes that actions conducted under each alternative would adhere to applicable federal, state, and local laws and policies including:

- Federal Noxious Weed Act of 1974
- Endangered Species Act of 1973, as amended
- Executive Order 13112: Invasive Species
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- NPS Management Policies 2006
- Director's Order 18: Wildlife Fire Management
- New York State Natural Heritage Program

All available information on plants and vegetative communities potentially impacted in the Seashore was compiled and reviewed. Maps showing vegetative cover and locations of sensitive plant species (such as state-listed species), and high-value habitats (such as maritime forests) were reviewed. Predictions about short- and long-term impacts on vegetation were based on the actions proposed under each alternative, and in most cases, these actions are undefined, making the impacts very general in nature. As actions are implemented under the approved GMP, site-specific planning and compliance would be conducted, as applicable.

Resource-specific context for assessing impacts of the alternatives on vegetation includes:

- Vegetation is part of the larger, continuous, diverse ecosystem that encompasses barrier islands and bluffs stretching from New York City to the very eastern end of Long Island. Potential for impacts to the larger system are dependent on the breath of impact (i.e., individual plant, local community, regional community) and the amount and frequency of disturbance and/or removal of vegetation.

- Vegetation is the basis of the ecological community, meaning that other important resources (such as coastal processes) depend on vegetation.
- The Sunken Forest, a maritime forest 250-300 year old, is a key natural feature of the Seashore
- Rare vegetation associations are unique, a consideration when determining whether an impact is likely to be significant according to CEQ criteria summarized at the beginning of this chapter.

VEGETATION

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Many of the proposed natural resource management activities are common to all alternatives and would have an overall beneficial impact on vegetation within the Seashore. These activities include:

- a comprehensive research and monitoring program
- cooperative stewardship of the resources
- increased educational programming
- regeneration of native vegetation, focusing on the Sunken Forest

- updating the threatened and endangered species management plan
- maintaining native plant and animal species
- developing and implementing an invasive species management plan
- implementing a marine resources management plan
- working with other agencies to understand vegetative changes (in particular wetland vegetation) related to climate change and sea-level rise

These actions and their beneficial impacts are generally discussed below.

Alternatives 2 and 3 would include efforts to encourage greater scientific and scholarly research. As part of these efforts, the Seashore would develop a coordinated, comprehensive research and monitoring program to better understand and manage the broad range of natural and cultural resources within the Seashore's boundaries. Studies could provide a better understanding of existing vegetative communities, which would allow for improved management of Seashore vegetation, both on land and within the marine environment. Building on this program, the NPS would promote cooperative stewardship of the resources with members of the public (both visitors and community residents), Seashore stakeholders, and other landowners/agencies to better protect vegetative communities and threatened and endangered plant species within Fire Island National Seashore. Increased educational programming focused on resource management would further promote these ideas and inform visitors and residents.

Under Alternatives 2 and 3, measures also would be taken to restore and maintain the vegetative character of the Sunken Forest and other maritime forests within the Seashore, which could include the regeneration of key canopy tree species and a variety of herbs and shrubs. These efforts would continue to improve the overall health of vegetation at the Seashore, a long-term beneficial impact that would be readily apparent as actions are implemented. The proposed actions would also improve the NPS's understanding of the impact of the Seashore's ever-changing conditions (i.e., ongoing erosion and climate change) on vegetation. Adaptive management strategies would be developed to identify and address the impacts of climate change on native vegetation, better protecting these resources as conditions change.

In addition, under Alternatives 2 and 3, the NPS would develop and implement a comprehensive marine resources management plan to enhance marine vegetation communities such as eelgrass beds. Restoring eelgrass beds within the marine environment would provide a long-term beneficial impact on other marine vegetation species that benefit from the increased productivity eelgrass provides.

Under Alternatives 2 and 3, the Seashore would enhance efforts to identify, monitor, and manage nonnative invasive plants within the Seashore's boundary (both on land and within the marine environment) and would develop a comprehensive invasive species management plan. Invasive plants species known to occur within the Seashore are described in "Chapter 3: Affected Environment." Invasive species have the ability to displace native species, adversely affecting wildlife populations reliant on native plants, and altering fire regimes. Therefore, reducing the spread and overall population of invasive plant species at the Seashore would increase the health of the native vegetation populations, a long-term beneficial impact.

At the William Floyd Estate, in addition to the management of nonnative plants, the Seashore would maintain the mixed habitat complex of field, forest, wetland, and marsh vegetation that currently exists on the property using the proposed Cultural Landscape Report and Treatment Plan (described in the "Cultural Resource Management" section below) as a guide. This would benefit both the cultural landscape at the Estate and the existing vegetation communities that would be preserved. Like Fire Island, the Seashore would also undertake additional surveys at the William Floyd Estate to obtain more information about the abundance and spatial distribution of flora. By learning more about the existing vegetation, the Seashore would be better prepared to manage the forest, shrub, and herbaceous layers as natural habitats. Additionally, at the William Floyd Estate, NPS would complete plans to address the wildland fire risk and the potential use of prescribed fire in the management of the cultural landscape. Prescribed fire would adversely impact targeted vegetation at the Estate but would have a long-term beneficial impact on the fields in the Lower Acreage.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under each of the proposed alternatives, the Seashore would continue to preserve cultural resources as funding becomes available. In general, these efforts would be focused on the William Floyd Estate, Carrington Estate, and the Fire Island Light Station. A Cultural Landscape Report and Treatment Plan would be developed for the Floyd Estate and the Light Station. These plans would include guidance for maintaining the various vegetation communities at the Estate and the Light Station to ensure their preservation, benefiting both the cultural landscape and the vegetation communities that make up these cultural landscapes. At the Estate, some plantings within the historic core may be replaced and would be in keeping with the existing vegetation communities. However, some actions, including identification and inventory of archeological resources throughout the Seashore, could require temporary disturbance of vegetation. These disturbances are not anticipated to have a noticeable impact on vegetation within the Seashore.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Alternatives 2 and 3 include the proposed development of a Coastal Land Use and Shoreline Management Plan in collaboration with relevant regulatory interests associated with Fire Island, and would incorporate the tenets of the Tentative Federally Supported Plan (TFSP) for FIMP. Such a plan would include measures to address shoreline protection and hazard mitigation in the context of the dynamic barrier environment and emerging trends resulting from sea-level rise and climate change. This plan could include efforts to protect and/or restore vegetation in the barrier environment.

In addition, consistent with the 1984 Land Protection Plan, the NPS would work to acquire property from willing sellers within the Seashore District as defined by the federal zoning standards. Once these areas are acquired, all structures and manmade improvements would be removed, and the area would be allowed to return to a natural state. Beneficial impacts that would come from restoring these areas include increases in vegetation to protect primary/secondary dunes from wind erosion and storm damage, as well as restoration of trees and shrubs available for wildlife on inland lots. These actions would increase the overall diversity and density of natural vegetative cover, a long-term beneficial impact on vegetation.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

All of the proposed alternatives would also continue to permit camping and recreational ORV use on the beach in front of the Fire Island Wilderness and the use of ORVs between Smith Point County Park and Moriches Inlet. ORVs would continue to occasionally travel outside designated routes through vegetated areas. ORVs have the potential to loosen soil from stabilizing plants, flatten herbaceous flora, and otherwise damage or destroy vegetation. However, the adverse impact associated with such activity would be minimal, because the Seashore strictly enforces rules for driving on the beach that preclude driving in vegetated areas. In addition, sensitive vegetation and dunal communities would continue to be fenced, where appropriate, to further minimize the adverse impacts associated with ORV use.

Continued camping in or near the Fire Island Wilderness could also result in continued, minimal human disturbances to vegetation, depending on the placement of camping equipment. However, the Seashore has taken steps to minimize adverse impacts to vegetation from camping, such as having no designated camp sites within the wilderness, establishing zones to distribute campers across the wilderness, limiting the number of camping permits issued for each night, and providing focused visitor education. As a result, it is anticipated that adverse impacts on vegetation from camping would not be noticeable when considered at the larger scale of the Seashore.

Within the Fire Island Wilderness, the facilities at Old Inlet lost during Hurricane Sandy in 2012 (including a boardwalk, vault toilet, and dock) would not be reconstructed. As the breached area fills in, a long-term beneficial impact on vegetation would occur as existing vegetation communities expand into this previously developed area.

In addition to the scholarly research described under "Natural Resource Management" above, under Alternatives 2 and 3 the Seashore would expand opportunities for public involvement in research at Fire Island National Seashore. This would include hands-on programming and activities such as "citizen science." Programs would be designed to emphasize public education and would encompass research, monitoring, and the adoption of best practices. Activities could include assisting with ongoing research or helping to eliminate or reduce the spread of invasive species. The studies conducted as part of these programs would

contribute to the overall understanding of the Seashore's natural resource communities, including vegetation, and therefore could lead to improved management of vegetation and special-status species. Programs that involve public efforts to eliminate or reduce invasive species would directly improve the health of existing vegetation at the Seashore, an overall long-term beneficial impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Maintaining the roadless environment and limiting bicycle use on federal lands to those areas where vehicles are permitted would continue to protect vegetation throughout the Seashore, a long-term beneficial impact. Other transportation and access components common to all alternatives would have no noticeable impact on vegetation at the Seashore.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, routine maintenance of the existing bulkheads, roads, trails, and/or boardwalks could result in temporary and localized adverse impacts on vegetation due to trimming of overhanging branches and removal of vines for pedestrian safety. The adverse impacts associated with routine maintenance would be short-term and minimal. Under Alternatives 2 and 3, the Seashore would model best practices for activities such as landscaping and any proposed development. The Seashore would work with others to encourage similar best management practices throughout Fire Island. Efforts could include more sustainable development practices, the use of native plant materials, implementation of pilot programs and demonstration projects, and raising public awareness of these practices. These efforts would result in greater understanding and sensitivity toward natural resources, including the existing vegetation, and could improve the overall health of vegetation within the Seashore by focusing on new methods to enhance and manage vegetation, a long-term beneficial impact.

VEGETATION

IMPACTS OF ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under Alternative 1, impacts to vegetation associated with natural resource management efforts would be similar to those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 1, the emergency use of sandbags and geotubes seaward of communities to prevent erosion would continue to be permitted. This could temporarily prohibit or reduce vegetation growth in these areas while the sandbags and geotubes are in place, a minimal adverse impact on vegetation.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts on vegetation from cultural resource management efforts would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

In addition to the impacts discussed in the "Impacts Common to All Alternatives" section, Alternative 1 would allow for the restoration of damaged properties after a storm event consistent with applicable local and federal zoning requirements, including restoration of the vegetation damaged by winds and/or erosion. This would ensure the preservation of existing vegetation communities within the Seashore.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts to vegetation associated with Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts on vegetation from transportation and access actions would be the same as those described in the "Impacts Common to All Alternatives" section above and, in general, would have no noticeable impact on vegetation at the Seashore.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and infrastructure components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to affect vegetation within the Seashore. There are no related regional plans or initiatives that are expected to have a cumulative impact on Seashore vegetation beyond what is described under this alternative.

Conclusion

Overall, Alternative 1 would result in long-term beneficial impacts on vegetation. Natural resource management components would be generally consistent with current efforts, including invasive plant management, and research and monitoring. These elements would improve the overall health of vegetation at the Seashore. From a cultural resource management perspective, there would be few long-term impacts to vegetation. A Cultural Landscape Report and Treatment Plan would be developed for the William Floyd Estate and Fire Island Light Station. The plans would include guidance for maintaining the various vegetation communities at the Estate and the Light Station to ensure their preservation, benefiting both the cultural landscape and the vegetation communities associated with them.

Under Alternative 1, visitors would have the opportunity to continue to use ORVs within the Seashore and to camp on the beach in front of the Fire Island Wilderness. Each of these elements of the Seashore experience could adversely impact vegetation at the Seashore. However, the adverse impact associated with these activities would be minimal, because the Seashore strictly enforces rules for driving on the beach that preclude driving in vegetated areas and has taken steps to minimize adverse impacts to vegetation from camping. As such, it is anticipated that adverse impacts on vegetation from visitor use would not be noticeable when considered at the larger scale of the Seashore.

In the short term, routine maintenance efforts, the emergency use of sandbags and geotubes to prevent erosion (if needed), and efforts to inventory cultural resources could adversely impact vegetation. The use of sandbags and geotubes could prohibit vegetation growth while they are in place. Again, these adverse impacts would be minimal and undetectable when compared to the overall beneficial impacts.

Benefits to vegetation resulting from the proposals summarized above would be considered significant as the overall health of unique vegetation communities (such as Sunken Forest, a fundamental resource within the Seashore) would be noticeably improved. Adverse impacts associated with the alternative would not be considered significant because their effect would be short term and localized.

VEGETATION

IMPACTS OF ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, Alternative 2 would focus on restoration and enhancement of natural resources and processes. For example, the Seashore would work with its partners to pursue a proactive program of natural resource protection within the Seashore that would seek to restore degraded or damaged ecosystems, as feasible. Beyond the native vegetation restoration efforts common to all alternatives, under Alternative 2 the NPS would also develop and execute an aggressive strategy for eradication of invasive nonnative plant species and the restoration of native species on federal lands through the most effective and environmentally sound means available. NPS would collaborate with the Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to encourage similar efforts outside of the Seashore. Efforts to restore native vegetation and reduce invasive species would enhance natural vegetation communities within

the Seashore and could improve the overall health of vegetative ecosystems, a long-term beneficial impact.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, cultural resource management efforts at the William Floyd Estate associated with Alternative 2 would have the potential to impact Seashore vegetation. Efforts to restore and rehabilitate the cultural landscape in the Lower Acreage at the William Floyd Estate would also beneficially affect vegetation. Specifically, the rehabilitation of existing features such as fields and marshlands would benefit those vegetation communities. However, some restoration efforts could minimally disturb and/or remove existing vegetation to create cultural landscape vignettes (e.g., introducing garden or cultivated areas) or during restoration of existing roads and trails. These efforts would cause both long-term (if vegetation is removed) and temporary (during restoration) disturbances to vegetation; however, they would be only slightly detectable and highly localized when compared to the overall beneficial impacts associated with Alternative 2.

▸ IMPACTS RELATED TO LAND USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore Experience elements of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, the Seashore would encourage a visitor experience that is "lighter on the land." Physical connections between Seashore sites and the developed communities could be reduced, lessening human impacts on vegetation in those locations, and potentially facilitating the regeneration of native vegetation. The number of visitor facilities would also be reduced under Alternative 2, including removal and/or consolidation of some of the facilities at Sailors Haven/Sunken Forest, and Talisman. At Watch Hill, the existing campground would be relocated to a more suitable area, allowing the existing area adjacent to the marsh to return to its naturally vegetated condition. The existing Wilderness Visitor Center also would be replaced with a smaller, simpler structure. Each of these actions would reduce the footprint of manmade structures within the Seashore and provide opportunities of the regrowth of native vegetation. The net expansion of vegetation communities within these areas would result in a long-term beneficial impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under Alternative 2, additional trails and boardwalks may be added to accommodate public access throughout the Seashore. At the William Floyd Estate, the boardwalk may be realigned in some locations, and a visitor observation blind or platform could be added next to an existing marsh and pond. Overall, adverse impacts on existing vegetation associated with these modifications would be localized and only slightly detectable (generally, the removal of a very minimal amount of existing vegetation). Therefore, transportation-related components of Alternative 2 would have no noticeable impact on vegetation at the Seashore.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, under Alternative 2, many of the Seashore facilities would be removed. For example, Seashore housing would be removed from Talisman, the Fire Island Light Station/Kismet Fire House would be removed after its lease expires in 2014, and the number of housing units at Sailors Haven and Watch Hill would likely be reduced. This would allow for restoration of any underlying and surrounding vegetation, resulting in a beneficial impact on vegetation. Conversely, Alternative 2 would include the expansion of the existing maintenance shop at the William Floyd Estate to accommodate a consolidated maintenance facility for the Estate and the eastern end of the Seashore. The extent of adverse impacts on vegetation would be dependent on the size of the development and location of the expansion relative to existing vegetation. It is anticipated that the Seashore would design the expansion so as to minimize adverse impacts on vegetation.

The removal of the existing facilities and development of the consolidated maintenance facility at the William Floyd Estate would require a temporary increase in human presence and construction equipment, which could affect vegetation in those areas in the short-term. Where possible, the construction vehicles and equipment would be staged away from vegetated areas to minimize adverse impacts. Upon completion, vegetation would be restored to the extent feasible.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact vegetation within and near the Seashore. There are no related regional plans or initiatives that are expected to have a cumulative impact on Seashore vegetation beyond what is described under this alternative.

Conclusion

Individual components of Alternative 2 would have impacts ranging from long-term beneficial to short-term adverse. However, overall, Alternative 2 would result in a long-term beneficial impact on vegetation. The benefits would be greater than those associated with Alternative 1, as the components of Alternative 2 have been designed to emphasize protection and restoration of natural, ecological systems, patterns, and resources within the Seashore.

Natural resource management efforts would focus on restoration and enhancement of natural resources and processes, and many of the existing facilities would be removed, consolidated, or replaced with smaller structures. Similar to Alternative 1, this alternative would include many actions that improve vegetative health, such as removal of invasive species, restoration of the vegetative character on the Sunken Forest, updating the threatened and endangered species plan, and implementing a marine resources plan. However, under Alternative 2 the Seashore would also develop and execute an aggressive strategy for eradication of invasive nonnative plants species and the restoration of native plant species on federal lands.

Efforts to rehabilitate the cultural landscape at the William Floyd Estate would have both adverse and beneficial impacts on the vegetation, though the overall impact on vegetation at the Estate would be beneficial.

Visitor experience components of this alternative could minimally adversely impact vegetation due to continued use of ORVs and camping. However, the adverse impacts would be slightly less than under Alternatives 1 and 3 because some resources/areas could be inaccessible to visitors. However, as described under Alternative 1, the adverse impact associated with these activities would be minimal because the Seashore strictly enforces rules for driving on the beach that preclude driving in vegetated areas and has taken steps to minimize adverse impacts to vegetation from camping. As such, it is anticipated that adverse impacts on vegetation from visitor use would not be noticeable when considered at the larger scale of the Seashore.

Operation and maintenance components would have an overall beneficial impact on vegetation because, despite the development of a consolidated maintenance facility at the William Floyd Estate, many structures would be removed from various locations throughout the Seashore, allowing for the regeneration of underlying and surrounding vegetation. In the short term, some components of this alternative such as efforts to enhance cultural resources, removal of existing structures, and development of new structures could adversely impact vegetation. It is anticipated that, in general, upon completion of the construction, demolition, and/or maintenance activities, vegetative conditions would be restored.

Benefits to vegetation resulting from the proposals summarized above would be considered significant as the overall health of unique vegetation communities, such as Sunken Forest, a fundamental resource within the Seashore, would be noticeably improved. This alternative also contributes to the larger barrier island system to a greater extent than Alternative 1. Adverse impacts associated with Alternative 2 would not be considered significant because their effects would be short term and localized.

VEGETATION

IMPACTS OF ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section, as well as those proposed under Alternative 1.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. In addition, similar to Alternative 2, cultural resource management efforts with the most potential to impact vegetation would be focused on the William Floyd Estate. Efforts to restore and rehabilitate the cultural landscape in the Lower Acreage at the William Floyd Estate would have an overall benefit on vegetation. In particular, the rehabilitation of existing features such as fields and marshlands would benefit this vegetation. However, restoration efforts could disturb and/or remove existing vegetation to create cultural landscape vignettes (e.g., introducing gardens or cultivated areas) and during restoration of existing roads and trails. These efforts would cause both long-term (if vegetation is removed) and temporary (during restoration) disturbances to vegetation. Overall, the impacts from these activities would be only slightly detectable and highly localized, when considering the long-term beneficial impacts on vegetation within the Seashore.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Land-use components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section; therefore the associated impacts would be same.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore Experience components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. The Seashore also would encourage greater distribution and dispersion of visitors across NPS facilities and encourage a broad range of experiences. In addition, the total number of backcountry camping permits issued by the Seashore would increase, allowing more individuals to camp on the beach in front of the wilderness. The number of backcountry camping permits within the Wilderness Area (a total of 36) would not increase. Increased camping on the beach could heighten adverse impacts on vegetation from human presence, depending on the placement of camping equipment. However, the Seashore has taken steps to minimize adverse impacts to vegetation from camping; therefore, it is anticipated that adverse impacts on vegetation from camping would not be noticeable when considered at the larger scale of the Seashore.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts on transportation and access components of Alternative 3 would include those described for Alternative 2. Additional trails and boardwalks may be added to accommodate public access throughout the Seashore. At the William Floyd Estate, the boardwalk may be realigned in some locations, and a visitor observation blind or platform could be added next to an existing marsh and pond. Overall, adverse impacts on existing vegetation associated with these modifications would be localized and only slightly detectable (generally, the removal of a very minimal amount of existing vegetation). Therefore, transportation-related components of Alternative 2 would have no noticeable impact on vegetation at the Seashore.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. Like Alternative 1, this alternative would include routine maintenance of the existing bulkheads, roads, trails, and boardwalks, which could minimally disturb vegetation. Structural improvements to existing facilities could include

incorporation of sustainable elements such as enhanced energy efficiency systems, stormwater management, and alternative technologies. These efforts would substantially benefit vegetative health at the Seashore in the long term.

Like Alternative 2, this alternative would include the expansion of the existing maintenance shop at the William Floyd Estate to accommodate a consolidated maintenance facility for the Estate and the eastern end of the Seashore. The extent of adverse impacts on vegetation would be dependent on the size of the development and location of the expansion relative to existing vegetation. It is anticipated that the expansion would be designed so as to minimize adverse impacts on vegetation.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact vegetation within and near the Seashore. There are no related regional plans or initiatives that are expected to have a cumulative impact on Seashore vegetation beyond what is described under this alternative.

Conclusions

Overall, Alternative 3 would result in a short-term adverse and long-term beneficial impact on vegetation. Natural resource management components would be generally consistent with those described in Alternative 1, including restoration of the vegetative character of the Sunken Forest and other maritime forests at the Seashore, invasive plant management, and improved research and monitoring. These elements would improve the overall health of vegetation at the Seashore as well as expand NPS knowledge related to the existing vegetation and the ongoing processes that are impacting vegetation on Fire Island.

Cultural resource management impacts to vegetation would primarily be related to restoration of the cultural landscape at the William Floyd Estate (primarily in the Lower Acreage) and would have an overall beneficial impact on vegetation. In addition, a Cultural Landscape Report and Treatment Plan would be developed for the William Floyd Estate and Fire Island Light Station. The plans would include guidance for maintaining the various vegetation communities at the Estate and the Light Station to ensure their preservation, benefiting both the cultural landscape and the vegetation communities that make up these cultural landscapes.

Consistent with the other alternatives, the development and implementation of a Coastal Land Use and Shoreline Management Plan could include efforts to protect vegetation on Fire Island from the effects of sea-level rise and climate change.

Visitors also would have the opportunity to continue to use ORVs within the Seashore and to camp within or on the beach in front of the Fire Island Wilderness. Each of these elements could adversely impact vegetation at the Seashore. Despite the potential for increased camping in the Wilderness under this alternative, as described for the other alternatives, the adverse impact associated with camping and ORV use would be minimal, because the Seashore strictly enforces rules for driving on the beach that preclude driving in vegetated areas and has taken steps to minimize adverse impacts to vegetation from camping. Thus, it is anticipated that adverse impacts on vegetation from visitor use would not be noticeable when considered at the larger scale of the Seashore.

Seashore operations, maintenance, and facilities components would have an overall beneficial impact on vegetation, because many of the structures would be consolidated. However, expansion of the existing maintenance shop at the William Floyd Estate could have a minor adverse impact on vegetation, depending on the scale and location of construction. In the short-term, activities such as the construction and/or demolition of existing structures, routine maintenance efforts, and efforts to enhance cultural resources could adversely impact vegetation. It is anticipated that, in general, upon completion of the construction, demolition, and/or maintenance activities, vegetative conditions would be restored.

Similar to Alternative 2, benefits to vegetation resulting from the proposals summarized above would be considered significant as the overall health of unique vegetation communities, such as Sunken Forest, a fundamental resource within the Seashore, would be noticeably improved. Alternative 3 also contributes to the larger barrier island system to a greater extent than Alternative 1. Adverse impacts associated with this alternative would not be considered significant because their effects would be short term and localized.

NATURAL RESOURCES

Impacts on Wildlife and Wildlife Habitat

Methodology

The impact analysis for wildlife and wildlife habitat assumes that actions conducted under each alternative would adhere to applicable federal, state, and local laws and policies including:

- Endangered Species Act of 1973, as amended
- 1918 Migratory Bird Treaty Act
- Executive Order 13186 – Protection of Migratory Birds
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- NPS Management Policies 2006
- 2006 Integrated Pest Management Plan
- New York State Natural Heritage Program
- Suffolk County Vector Control and Wetlands Management Long-Team Plan

NPS Management Policies 2006 for biological resource management (section 4.4 et seq.) states that "the National Park Service will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems." According to NPS Management Policies 2006 (NPS 2006), the restoration of native species is a high priority. Management goals for wildlife and wildlife habitat include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals.

Information on wildlife and wildlife habitat was taken from Seashore documents and records. The Seashore natural resource management staff, the USFWS, and the New York Natural Heritage Program also provided wildlife and wildlife habitat information. Similar to the analysis of impacts on vegetation, predictions about short- and long-term impacts on wildlife and wildlife habitat were based on the actions proposed in each alternative and in most cases, these actions are undefined. Therefore the impacts are very general in nature. As actions are implemented under the approved GMP, site-specific planning and compliance would be conducted, as applicable. In general, impacts are described below based on the availability of suitable high-quality habitat, which is a critical factor in the abundance and diversity of wildlife species present. On the reverse side, actions that would result in the loss of suitable high-quality habitat would be considered adverse.

The resource-specific context for the evaluation of impacts on wildlife and wildlife habitat included the following:

The degree to which abundance and diversity of native species and/or the quality of their habitat are disrupted, and whether those disruptions would be within the natural range of variability.

WILDLIFE & WILDLIFE HABITAT

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Because vegetation and wildlife impacts are so intertwined, all of the proposed natural resource management activities described under "Impacts Common to All Alternatives" for Vegetation would also have an overall beneficial impact on wildlife and wildlife

habitat within the Seashore. Again, these activities include:

- a comprehensive research and monitoring program
- cooperative stewardship of the resources
- increased educational programming
- restoration of native vegetation, focusing on the Sunken Forest
- updating the threatened and endangered species management plan
- maintaining native plant and animal species
- developing and implementing an invasive species management plan
- implementing a marine resources management plan
- working with other agencies to understand habitat changes (in particular wetland vegetation) related to climate change and sea level rise

Additional natural resource management actions that would also result in a long-term beneficial impact on wildlife and wildlife habitat include the creation of beach habitat at Sailors Haven, and minimizing manmade light and noise sources. These actions and their resulting beneficial impacts are described below.

Under Alternatives 2 and 3 the Seashore would develop a coordinated, comprehensive research and monitoring program to better understand and manage the broad range of natural and cultural resources within the Seashore's boundaries. Studies conducted could provide a better understanding of existing wildlife communities as well as existing habitat areas, which would allow for improved management of the wildlife and wildlife habitat that occupy the Seashore. Using the knowledge from this program, the NPS also would promote cooperative stewardship of the natural resources with members of the public, Seashore stakeholders, and other land managers. Increased research and monitoring, as well as cooperative stewardship, would provide indirect, long-term beneficial impacts on wildlife and wildlife habitat.

Under Alternatives 2 and 3, the Seashore would make efforts to restore native vegetation in the Sunken Forest and maritime forests, and control invasive species across Fire Island and at the William Floyd Estate. If necessary, an invasive species management plan would also be developed. The removal of invasive species would benefit wildlife habitat by removing plant life unsuitable for wildlife use and providing sustainable nesting and foraging habitat for local fauna.

Under Alternatives 2 and 3, the Seashore would develop a management plan for the long-term sustainability of marine environments and the aquatic species inhabiting the Great South Bay and Atlantic Ocean. Monitoring of fin and shellfish populations would be implemented so as to detect trends and make future management decisions, which would improve long-term conditions for marine life. Under all alternatives, specific habitats important to the life cycle of marine life, such as estuaries and subaquatic vegetation, would be monitored through collaborative efforts among Seashore staff and wetland researchers.

The Seashore would continue to monitor bird species that use the Seashore through collaboration with volunteer bird-watching groups and bird enthusiasts. The Seashore would continue to sponsor bird-watching tours and actively promote wildlife recreational tourism. Data gathered would be shared with other wildlife agencies involved with overseeing the management of migratory birds.

The reduction of manmade light and noise impacts within the Seashore would promote more natural habitat conditions and beneficially impact wildlife and wildlife habitat. In general, the existing intrusions are fairly minimal, so any changes would be only slightly detectable.

In addition, each of the proposed alternatives would include continued tick and mosquito surveillance and management at the Seashore. It is not likely that these efforts would cause noticeable impacts on wildlife or wildlife habitat.

Lastly, as sea-level rise continues at an accelerated rate, coastal habitats could be reduced or eliminated. This would expand the available habitat for marine species, but limit the available habitat for terrestrial species. As described in the "Impacts on Coastal Processes and Floodplains" section of this chapter, the implementation of adaptive management approaches and mitigation techniques at the Seashore could reduce the adverse impacts of sea-level rise on Fire Island's resources, thereby increasing the potential for additional wildlife habitat within the Seashore. Further impacts on marine resources are described in the "Water Resources" section above.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under each of the proposed alternatives, the Seashore would continue to preserve cultural resources as funding becomes available. These actions would cause a temporary increase in human presence and associated noise, but overall the impacts would be highly localized and barely detectable. At the William Floyd Estate, a Cultural Landscape Report and Treatment Plan would be developed. This plan would include guidance for maintaining the various vegetation communities (and therefore habitats) within the Lower Acreage of the Estate, which include hardwood forests, open fields, marshland, and open- water ponds. Maintaining a diversity of high-quality habitat types within the Lower Acreage offers a long-term beneficial impact to a variety of wildlife species.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Alternatives 2 and 3 propose the development of a Coastal Land Use and Shoreline Management Plan. The plan would include measures to address shoreline protection, hazard mitigation, land-use controls, and site planning and design guidelines in the context of the dynamic barrier environment and emerging trends resulting from sea-level rise and climate change. Implementation of such a plan would help to protect the barrier environment on Fire Island, thereby preserving the existing wildlife habitat as well as the associated wildlife.

In addition, consistent with the 1984 Land Protection Plan, the NPS would work to acquire property from willing sellers within the Seashore District as defined by the federal zoning standards. Once these areas are acquired, all structures would be removed, and the area would be allowed to return to a natural state. This action would result in beneficial impacts on wildlife and wildlife habitat. Such habitat may include the restoration of primary dunal system previously occupied by houses that could be used by shorebirds and migratory passerines such as sparrows and finches. For inland lots, restoration of habitats would benefit avian species and small mammals that utilize thickets and forested habitats.

Efforts to educate community leaders and residents about the importance of wildlife management at the Seashore and the harm to wildlife caused by certain human actions would be of long-term benefit for wildlife and wildlife populations within the Seashore.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under all alternatives, wildlife populations would continue to be minimally disturbed by the human presence. It is anticipated that Seashore visitation would be generally consistent with current levels. Guided tours, such as those at the Sunken Forest, would introduce humans into the natural environment, causing temporary, localized, and negligible wildlife disturbances, although some species of wildlife in this area are habituated to humans. Continued visitor use of the beaches, including camping on the beach in front of the Fire Island Wilderness, and ORV use on some beaches, could disrupt shorebird activity. Efforts to protect the Piping Plover, however, would reduce these impacts. Specifically, ORV use is not permitted or severely restricted during critical nesting seasons and campers are urged to respect existing exclosures, which are designed to protect threatened and endangered species.

Within the Fire Island Wilderness, the facilities at Old Inlet lost during Hurricane Sandy in 2012 (including a boardwalk, vault toilet, and dock) would not be reconstructed. The loss of these manmade facilities allows for a net increase in available wildlife habitat within the wilderness, a long-term beneficial impact.

Continued public education and outreach efforts by the Seashore could better inform the public about wildlife-related issues. For example, brochures would continue to be released related to living with wildlife and would include information related to a variety of topics including Lyme disease and ticks and feeding wildlife. This information also would continue to be provided by interpretive rangers and other Seashore staff as appropriate and would be posted on the Seashore's website and social media. Providing the public with ample information about wildlife and the potential hazards of human-wildlife interactions could support better appreciation for and protection of wildlife species within the Seashore, a long-term beneficial impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under each of the proposed alternatives, land-based vehicular access to the Seashore would be generally consistent with current conditions, including the use of vehicles along the beach in some areas. As described in "Chapter 3: Affected Environment," the Seashore is within the Atlantic Flyway, a major North American migratory bird route. The beaches at the Seashore

provide important habitat for a variety of migratory and resident birds including plovers, sanderlings, red knots, and sandpipers. The recreational use of vehicles on Fire Island beaches would continue to minimally disrupt shorebirds that rely on the beach as their primary habitat for foraging and loafing. Under Alternatives 2 and 3, the Seashore would collaborate with Fire Island communities and towns of Islip and Brookhaven to develop a "driver's manual" that would educate residents, workers, and recreational users about driving etiquette and getting around on Fire Island. If this manual includes information about beach driving, the adverse impacts summarized above could be minimized.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Each of the proposed alternatives would include some level of routine maintenance of the existing boardwalks and trails. These efforts would include clearing/trimming overhanging brush and vines, which could reduce the available nesting and foraging habitat. The overall impact is likely to be short-term, localized, and only slightly detectable, since species that previously used the low-hanging brush and vines for nesting and/or foraging purposes would likely find another location within the Seashore to serve the same purpose. Routine mowing would also continue around the Old Mastic House and at fields at the William Floyd Estate as management of the cultural landscape. This action would cause temporary disturbances to birds and small mammals during mowing but would continue to maintain field/meadow habitats important to wildlife species that prefer open field conditions.

In addition, routine maintenance of the existing bulkheads, roads, trails, and boardwalks could result in temporary and localized adverse impacts on wildlife and wildlife habitat due to the increased human presence and associated increase in noise, vehicles, and equipment. Under all alternatives, operational maintenance of existing marinas and boat docks would continue, including channel dredging and piling replacement, which would have temporary impacts to fisheries and shorebirds resulting from increased turbidity and noise. The adverse impacts associated with routine maintenance would be minimal and would likely not be noticeable in the long term.

WILDLIFE & WILDLIFE HABITAT

IMPACTS OF ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Long-term beneficial impacts on wildlife and wildlife habitat from natural resource management components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under Alternative 1, improvements to cultural resources that could impact wildlife and wildlife habitat include restoration of the Carrington Estate because of the increased human presence and noise associated with these activities. Improvements to cultural resources at the William Floyd Estate and Fire Island Light Station, such as routine maintenance, also could result in temporary disturbance of wildlife due to an increased human presence and associated noise. These impacts would be temporary and localized and would be unlikely to have a noticeable long-term impact on wildlife and/or wildlife habitat within the Seashore.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section. In addition, Alternative 1 would support the redevelopment of properties damaged from storm

events. During redevelopment, human presence and associated noise would be concentrated on these properties, resulting in short-term (during construction) and localized disruptions to wildlife and wildlife habitat. Although they would occur in compliance with local codes, state and federal laws, and the Secretary of the Interior's zoning standards, the redevelopment(s) would also be considered a continued, long-term adverse impact on wildlife and wildlife habitat, since properties redeveloped to their original condition (i.e., structures reconstructed) would occupy space that could otherwise revert to use as available wildlife habitat. In considering the balance of available habitat throughout the Seashore, the adverse impact would be minor.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with Seashore experience, interpretation, education, and outreach components of Alternative 1 would be consistent with those described in the "Impacts Common to All Alternatives" section. Under Alternative 1, it is anticipated that Seashore visitation would be generally consistent with current levels. Guided tours, such as those at the Sunken Forest, would introduce humans in to the natural environment, causing temporary, localized, and negligible wildlife disturbances, although some species of wildlife in this area are habituated to humans.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with Seashore operations, maintenance, and facilities components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact wildlife and wildlife habitat within the Seashore. These actions include dredging, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, the Great South Bay Clam Restoration Project, and the four-poster baiting stations for tick management on nonfederal lands.

Routine dredging activities near Fire Island National Seashore to maintain channels within the Great South Bay and efforts associated with the Long Island Intracoastal Waterway Federal Navigation Project would continue to periodically disrupt marine wildlife and wildlife habitat. Once dredging activities are completed, temporarily disturbed wildlife populations could return and continue to use the waterways.

Policies associated with the New York State Coastal Zone Management Plan changes are aimed at improving the state's coastal zones and the associated resources. Many of the strategies proposed in the 2011-2016 assessment would benefit wildlife and wildlife habitat, including updating the Significant Habitat Program, establishing a direct permit program for activities within state-designated Significant Coastal Fish and Wildlife Habitats, updating the NYS coastal policies to explicitly address marine debris and resource impacts, and developing phased amendments to the NYS CMP relative to habitat protection and criteria for siting wind energy generation and transmission facilities. Implementing these activities could result in a net increase in available high-quality habitat, and therefore a long-term beneficial impact on wildlife and wildlife habitat.

The Long Island South Shore Estuary Reserve Comprehensive Management Plan provides the foundation for the long-term health of the Reserve's bays, tributaries, tidal wetlands, wildlife, tourism, and economy and supports a variety of associated projects. Efforts to protect and restore living resources and their associated habitats, including water quality conditions, could enhance marine and wetland habitats within the Seashore, a long-term beneficial impact.

Suffolk County Vector Control is responsible for controlling mosquito populations that are of public health importance. The goal of the Vector Control and Wetland Management Plan is to develop an effective long-term vector control program, minimize pesticide usage while protecting public health, and to preserve and restore wetlands managed by vector control. These wetlands provide habitat for a variety of wildlife species; therefore, improvements to the wetlands would benefit wildlife and wildlife habitat.

The Great South Bay Clam Restoration working group was established by Suffolk County in 2008 to develop a sustainable management plan for the Great South Bay hard clam population. If the group's recommendations to reestablish and protect the hard clam population are implemented, then other marine wildlife resources could benefit from the improved habitat conditions within the Great South Bay, a long-term beneficial impact.

Continued approval and use of the four-poster baiting stations for tick management on non-federal lands provides a regular, introduced food source for the deer populations within the communities. These four-poster baiting stations could have a slightly detectable adverse impact on wildlife and wildlife habitat, disrupting natural conditions.

Generally, these past, present, and reasonably foreseeable future actions would result in a long-term beneficial impact on wildlife and wildlife habitat at the Seashore. The impacts of past, present, and reasonably foreseeable future actions, in combination with the impacts of Alternative 1, would result in overall beneficial cumulative impacts. Alternative 1 would contribute noticeably to the overall beneficial impact.

Conclusion

The individual elements of Alternative 1 would result in a range of impacts to wildlife and wildlife habitat from long-term, beneficial to short-term and adverse. Natural resource management components of Alternative 1 would generally have a long-term beneficial impact on wildlife and wildlife habitat. This would primarily be related to restoration of critical habitat areas. However, some natural resource management efforts also would result in minor adverse impacts on wildlife and wildlife habitat such as continued fishing within the bay.

Adverse impacts associated with the cultural resource management efforts of Alternative 1 would be highly localized and barely detectable, lasting only as long as improvements are underway.

Impacts associated with the land-use and development components of Alternative 1 would result in both short-term adverse and long-term beneficial impacts, because although efforts would be made to increase wildlife habitat as new properties are acquired, redevelopment of structures would be allowed after storm events.

The continued human presence within the Seashore minimally disturbs wildlife, including camping and ORV use along the beaches, which are used by shorebirds for foraging and loafing. Short-term adverse impacts on wildlife and wildlife habitat would include routine maintenance of existing facilities and infrastructure and human intervention to maintain natural resources and processes. Although continued disruptions to wildlife and wildlife habitat from infrastructure improvements and visitor presence would cause slightly detectable, localized adverse impacts, the overall impact would be long-term, beneficial due to the increase natural resource management activities.

The cumulative impact would be long-term beneficial, and Alternative 1 would contribute a noticeable beneficial increment to the overall cumulative impact.

Benefits to wildlife resulting from the proposals summarized above would not be considered significant as the overall health of the vegetation is improved but the abundance and diversity of wildlife species likely to use the habitat may not change to a noticeable degree. Adverse impacts associated with Alternative 1 would not be considered significant because their effect would be short-term and localized.

WILDLIFE & WILDLIFE HABITAT

IMPACTS OF ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

In addition to the impacts described in the "Impacts Common to All Alternatives" section, Alternative 2 would focus on restoration and enhancement of natural resources and processes. For example, the Seashore would work with its partners to pursue a proactive program of natural resource protection that would seek to restore degraded or damaged ecosystems within the Seashore, as feasible. Beyond the native vegetation restoration efforts common to all alternatives, under Alternative 2 the NPS would also develop and execute an aggressive strategy for eradication of invasive nonnative plant and animal species and the restoration of native plant and animal species on federal lands through the most effective and environmentally sound means available. The NPS would collaborate with the Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to encourage similar efforts on non-federal lands within the Seashore. Efforts

to restore native vegetation and reduce invasive species would enhance natural vegetative communities within the Seashore and could improve the overall health of wildlife habitat, a long-term beneficial impact. Within the coastal environment, the eradication of mute swans, Asian shore crabs, and colonial tunicates would greatly enhance the habitat available for native species, minimizing competition for resources within the marine environment.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Cultural resource management components of Alternative 2 with the greatest potential for affecting wildlife and wildlife habitat would be those focused on the William Floyd Estate. Efforts to restore and rehabilitate the cultural landscape at the William Floyd Estate would have benefits to vegetation, which would in turn improve wildlife habitat. The rehabilitation of existing features at the Estate such as fields and marshlands would improve available habitat for some wildlife species. However, restoration efforts could also temporarily disturb and/or remove existing vegetation to create cultural landscape vignettes and restore existing roads and trails. Therefore, in addition to the impacts discussed in the "Common to All Alternatives" section, improvements to cultural resources proposed under this alternative could temporarily disrupt wildlife and wildlife habitat due to increased human presence and associated vehicles/equipment and noise. Over the long term, measures to maintain and rehabilitate the cultural landscape would result in a long-term beneficial impact on wildlife and wildlife habitat.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with land use and development components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with Seashore Experience components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. It is anticipated that Seashore visitation would be slightly lower than current levels under Alternative 2. However, as part of the Seashore efforts to restore and protect existing resources, visitor access could be restricted in some areas. As such, impacts on wildlife and wildlife habitat could be slightly reduced near these resources through less human disturbances and contact.

In order to further enhance natural resource values under Alterative 2, the NPS would remove and/or consolidate some of the facilities at Sailors Haven/Sunken Forest and Talisman. At Watch Hill, the existing campground would be relocated to a more suitable area, allowing the existing area adjacent to the marsh to return to its naturally vegetated condition. The existing Wilderness Visitor Center also would be replaced with a smaller, simpler structure. Each of these actions would reduce the footprint of manmade structures within the Seashore and provide opportunities for the regrowth of native vegetation and therefore the expansion of available high-quality wildlife habitat. The net expansion of natural areas would result in a long-term beneficial impact on wildlife and wildlife habitat.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, Alternative 2 would reduce the number of facilities at the Seashore (as described above), thereby reducing disturbances to wildlife and wildlife habitat. The removal of existing structures could result in restoration of habitat for wildlife usage. In addition, the removal of these structures over time may result in lower visitor attendance compared to the other alternatives. The reduced human presence associated with this alternative would decrease disturbances to wildlife, including noise, pollution, and

wildlife/human interactions. The restoration of coastal processes also would enhance wildlife habitat, especially for bay-side estuaries used by wetland-dependent species and shorebirds.

At the William Floyd Estate, the existing maintenance facility would be expanded slightly, resulting in short-term, negligible adverse impacts on wildlife using the area, as wildlife may be temporarily displaced during construction activities due to increased noise and human activities.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact wildlife and wildlife habitat within the Seashore. As described under Alternative 1, these actions include dredging, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, the Great South Bay Clam Restoration Project, and the four-poster baiting stations for tick management on nonfederal lands. When combining the beneficial and adverse impacts of these past, present, and reasonably foreseeable future actions with the impacts of Alternative 2, a long-term beneficial cumulative impact on wildlife and wildlife habitat would result. Alternative 2 would contribute a noticeable beneficial increment to the overall beneficial impact.

Conclusion

Alternative 2 would result in both adverse and beneficial impacts on wildlife and wildlife habitat; however, the overall impact would be long-term and beneficial. Beneficial impacts would primarily be related to restoration of critical habitat areas; removal of many of the existing facilities; implementation of the marine resources management plan, and updated threatened and endangered species management plan; and implementation of an aggressive invasive species management plan.

From a resource management perspective, beneficial impacts would primarily be related to the rehabilitation of the cultural landscape within the Lower Acreage at the William Floyd Estate. Rehabilitating the cultural landscape at the Estate also would result in short-term adverse impacts as landscape vignettes are installed and boardwalks/roads are rehabilitated for visitor use.

Land-use and development components of Alternative 2 would primarily be focused on the restoration and protection of wildlife habitat as new properties are acquired.

Although visitation may be slightly reduced under this alternative, access would likely be restricted in some areas to accommodate natural restoration and protection of resources. These restrictions would limit the human presence, resulting in a beneficial impact on wildlife and wildlife habitat. The benefits would be enhanced by the removal of some of the existing facilities and infrastructure, allowing those areas to be restored to their natural conditions and potentially expanding the habitat available to wildlife at the Seashore.

Transportation and Seashore experience elements such as continued use of ORVs and camping on the beaches would continue to adversely impact shorebird habitat.

Overall, Alternative 2 would result in a long-term beneficial impact on wildlife and wildlife habitat due to the increase in available high-quality habitat and the additional protections afforded through natural resource management activities.

The cumulative impact would be long-term beneficial, and Alternative 2 would contribute a noticeable beneficial increment to the overall cumulative impact.

Benefits to wildlife resulting from the proposals summarized above would not be considered significant as the overall health of vegetation is improved to a greater degree than under Alternatives 1 and 3, but the abundance and diversity of wildlife species likely to use the habitat is unlikely to change to a noticeable degree.

Adverse impacts associated with Alternative 2 would not be considered significant because they would not permanently disrupt the abundance or diversity of native wildlife species.

WILDLIFE & WILDLIFE HABITAT

IMPACTS OF ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section.

Consistent with the other alternatives, tick and mosquito surveillance and management efforts would continue within the Seashore. Although these efforts would have a negligible impact on the wildlife population under the other alternatives, under Alternative 3 the Seashore would implement low-impact techniques to minimize impacts on other resources, such as wildlife and their habitats. Vector management would be proactive, and treatment of high risk/high use areas would occur on a regular schedule to ensure visitor health and safety and make greater allowances for visitor comfort. Techniques employed would be selected to minimize impacts to wildlife.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with cultural resource management actions would be the same as those described under "Impacts Common to All Alternatives" and under Alternative 2. At the William Floyd Estate, the curatorial facility would be expanded by 1,000 square feet, resulting in a temporary displacement of wildlife during construction.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section and under Alternative 2.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore Experience components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. Under Alternative 3, the Seashore could experience a slight increase in visitation. The increased human presence could slightly increase disturbances to wildlife and wildlife habitat. In addition to the larger number of visitors, more opportunities would be provided for increased visitor dispersion to experience Fire Island's natural and cultural resources. However, with more visitors having greater access across Fire Island, increased disturbances to wildlife and wildlife habitat would be expected, with more human-wildlife interactions across federal lands. In particular, the potential for human/deer interactions and disturbances to bird species would increase beyond the existing concentrated areas of human use (campgrounds, boardwalks, concessions, etc.) at Sailors Haven and Watch Hill.

In addition, the total number of backcountry camping permits issued by the Seashore would increase, allowing more individuals to camp on the beach in front of the wilderness. Increased camping on the beach could heighten adverse impacts on vegetation and wildlife from the human presence, depending on the placement of camping equipment. However, the Seashore has taken steps to minimize adverse impacts on resources from camping; therefore, it is anticipated that adverse impacts on wildlife and wildlife habitat from camping would not be noticeable when considered at the larger scale of the Seashore.

Alternative 3 could also include improvements to and/or redevelopment of some of the Seashore's visitor facilities. Although the improvements would be designed to be sensitive and responsive to the natural environment and could benefit wildlife and wildlife habitat in the long term through sustainable planning, development activities would increase the human presence and associated noise and vehicles/equipment needed for construction and maintenance. This would cause temporary disturbances to wildlife and wildlife habitat.

Alternative 3 would integrate additional educational/interactive visitor amenities and outreach, particularly with residents and visitors within the communities, to promote the concept of responsible human use and protection of the natural environment on an ever-changing barrier island. Emphasis would be placed on the

importance of maritime wildlife habitats for resident and migratory bird species, and the importance of taking steps to improve estuarine/marine habitats and water quality for aquatic animals. This step would increase awareness of wildlife populations important to the character of the island, and could result in indirect improvements to wildlife habitats.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. In addition, at the William Floyd Estate, the existing maintenance facility would be expanded slightly, resulting in short-term, negligible adverse impacts on wildlife using the area, as wildlife may be temporarily displaced during construction activities due to increased noise and human activity.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact wildlife and wildlife habitat within the Seashore. As described under Alternative 1, these actions include dredging, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, the Great South Bay Clam Restoration Project, and the four-poster baiting stations for tick management on nonfederal lands. When combining the beneficial and adverse impacts of these past, present, and reasonably foreseeable future actions with the impacts of Alternative 3, a long-term beneficial cumulative impact on wildlife and wildlife habitat would result. Alternative 3 would contribute a noticeable beneficial increment to the overall beneficial impact.

Conclusion

Overall, Alternative 3 would result in both adverse and beneficial impacts on wildlife and wildlife habitat. Similar to Alternatives 1 and 2, the overall long-term impact would be beneficial due to restoration of critical habitat areas; implementation of the marine resources management plan, and updated threatened and endangered species management plan; and implementation of an aggressive invasive species management plan.

Cultural resource management efforts would have both adverse and beneficial impacts on wildlife and wildlife habitat. Rehabilitation of the cultural landscape at the William Floyd Estate would restore some habitat types, such as fields and marshlands, but could temporarily disturb wildlife during planting of landscape vignettes and rehabilitation of boardwalks and roads.

Land-use and development components of Alternative 3 would primarily be focused on the restoration and protection of wildlife habitat as new properties are acquired through willing sellers.

The continued human presence within the Seashore minimally and locally disturbs wildlife, including camping and ORV use along the beaches, which is used by shorebirds for foraging and loafing. Because visitors could be more dispersed under this alternative in comparison to Alternative 1, the adverse impact to wildlife and wildlife habitat could be slightly greater under Alternative 3. Short-term adverse impacts on wildlife and wildlife habitat would include routine maintenance of existing facilities and infrastructure, human intervention to restore and protect natural resources and processes, and rehabilitation of existing facilities and landscapes. Continued disruptions to wildlife and wildlife habitat from existing infrastructure and the visitor presence would cause slightly detectable, localized adverse impacts; however, due to the increased protection and restoration of natural resources, Alternative 3 would result in an overall, long-term beneficial impact.

The cumulative impact would be long-term beneficial, and Alternative 3 would contribute a noticeable beneficial increment to the overall beneficial cumulative impact.

Benefits to wildlife resulting from the proposals summarized above would not be considered significant as the overall health of vegetation is improved to a greater degree than under Alternatives 1, but the abundance and diversity of wildlife species likely to use the habitat is unlikely to change to a noticeable degree. Adverse impacts associated with Alternative 3 would not be considered significant because they would not permanently disrupt the abundance or diversity of native wildlife species.

NATURAL RESOURCES

Impacts on Special-Status Species

Methodology

The National Park Service is mandated to manage and protect state and federal special-status species within the Seashore. Due to the dynamics of special-status species populations and mobility of individuals, Seashore staff routinely perform surveys to locate and document population numbers of listed plants and animals. For this assessment, all available information and mapping on special-status species potentially impacted in the Seashore was compiled and reviewed. All listed plant and animal species known to occur within Seashore boundaries are found either on the island or within the marine environment, with the exception of the state endangered dark-green sedge (Carex vanusta), which occurs in the upper salt marsh at the William Floyd Estate. Thus, the majority of actions potentially affecting special-status species would be those on Fire Island.

Predictions about short- and long-term impacts on special-status species were based on the actions proposed in each alternative, and in most cases these actions are undefined. Therefore the impacts are very general in nature. As actions are implemented under the approved GMP, site-specific planning and compliance would be conducted, as applicable.

The impact analysis for special-status species assumes that actions conducted under each alternative would adhere to applicable federal, state, and NPS policies including:

- Endangered Species Act of 1973, as amended
- 1918 Migratory Bird Treaty Act
- Executive Order 13186 – Protection of Migratory Birds
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- NPS Management Policies 2006
- 2006 Integrated Pest Management Plan

- NPS Director's Order 77 – Natural Resource Management
- New York State Endangered Species Act (ECL § 11-0535)
- New York State Natural Heritage Program
- Suffolk County Vector Control and Wetlands Management Long-Team Plan

The resource-specific context for the evaluation of impacts on special-status species includes the following:

- The criteria used by all agencies to determine whether an impact is significant (CEQ criteria) include one that addresses adverse effects on listed species or their habitat.
- The CEQ criteria include whether a resource is unique; by default, a rare, threatened, or endangered animal or plant is unique.
- Because listed species are scarce, the Endangered Species Act finds that any harassment of a single individual is a "take" as defined under the Act and requires consultation and a permit before a federal action can move forward.

SPECIAL-STATUS SPECIES

IMPACTS COMMON TO ALL ALTERNATIVES

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Many of the natural resource management impacts described for vegetation and wildlife in previous sections would also apply for special-status species. These include:

- a comprehensive research and monitoring program
- cooperative stewardship of the resources
- increased educational programming
- restoration of native vegetation
- updating the threatened and endangered species management plan
- maintaining native plant and animal species
- developing and implementing a deer and vegetation management plan
- developing and implementing an invasive species management plan
- implementing a marine resources management plan
- working with other agencies to understand habitat changes (in particular wetland vegetation) related to climate change and sea-level rise

In addition to the natural resource management actions previously described under the wildlife and wildlife habitat section (beach creation, research and monitoring, marine and aquatic species management plan, and bird monitoring programs), the existing threatened and endangered species management plan also would be updated to include provisions to consider and address the potential effects of climate change and sea-level rise on threatened and endangered species.

Federally listed seabeach amaranth and the state-listed seabeach knotweed are found within the Seashore. Through the implementation of the threatened and endangered species management plan, these species would continue to be protected through monitoring and fencing. Additional research to understand disturbance impacts on these species may help to modify protective actions and increase population numbers in the long term.

The effects of overwash from Hurricane Sandy on Fire Island created additional expanses of open, sandy areas favorable as nesting habitat for the piping plover and least tern. The Seashore will monitor the use of these newly formed habitats by colonial nesting birds as part of the threatened and endangered species management plan.

The Seashore would also work collaboratively with public agencies and non-profit conservation organizations to protect species of special concern within the Seashore's boundaries, as appropriate and feasible. Enhanced management and protection of threatened and endangered species would have clear beneficial impacts on the species that reside (even seasonally) within the Seashore's boundaries, offering increased habitat protection through fencing and other mechanisms. All alternatives would continue efforts to preserve and monitor critical habitats and open spaces for the protection of threatened and endangered shorebirds and coastal plants. Improved monitoring also could increase knowledge and improve decision making by Seashore staff, resulting in beneficial impacts on wildlife and wildlife habitat.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under each of the proposed alternatives, the Seashore would continue to preserve cultural resources as funding becomes available. These actions would cause a temporary increase in human presence and associated noise, but overall the impacts would be highly localized and barely detectable. At the William Floyd Estate, a Cultural Landscape Report and Treatment Plan would be developed focused primarily on the historic Mastic house, outbuildings, and grounds. This plan would include guidance for maintaining the various vegetation communities (and therefore habitats) within the Lower Acreage of the Estate, which include the habitats available to the dark-green sedge.

Management of cultural resources at the island, such as the lighthouse, would occur in habitats typically not associated with those special-status species found at the park. Therefore, cultural resources management actions are not anticipated to have an impact on special-status species.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Alternatives 2 and 3 propose the development of a Coastal Land Use and Shoreline Management Plan. The plan would include measures to address shoreline protection, hazard mitigation, land-use controls, and site planning and design guidelines in the context of the dynamic barrier environment and emerging trends resulting from sea-level rise and climate change. Implementation of such a plan would help to protect key habitat for special-status species that utilize shoreline habitats such as colonial nesting shorebirds, seabeach amaranth, and seabeach knotweed.

In addition, consistent with the 1984 Land Protection Plan, each of the alternatives would include efforts to promote the protection of wildlife habitat when new properties are acquired by the NPS, resulting in the removal of manmade structures. Natural habitats would be restored that could provide beneficial impacts on special-status species plants that rely on secondary dune habitats as their preferred habitat.

A component of the deer and vegetation management plan would be to identify and protect special-status plants from deer herbivory, particularly the seabeach amaranth and seabeach knotweed. Seashore staff would continue to monitor existing plant populations, search for new populations, and protect these plants from deer herbivory by installing exclosure screening around plant populations or protective netting over individual plants.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Because many of the special-status species found at the Seashore naturally occur in wetland or marine environments, disturbance by the public is generally not a concern. However, continued visitor use of the beaches, including camping in and on the beach in front of the Fire Island Wilderness, and ORV use on some beaches, could disrupt special-status shorebird breeding activity. Resource management efforts to protect the Piping Plover, however, would reduce these impacts. Specifically, ORV use is not permitted or severely restricted during critical nesting seasons and campers are urged to respect existing exclosures, which are designed to protect threatened and endangered species.

Within the Fire Island Wilderness, the facilities at Old Inlet lost during Hurricane Sandy in 2012 (including a boardwalk, vault toilet, and dock) would not be reconstructed. The loss of these manmade facilities allows for a net increase in available habitat for special-status birds and plants within the wilderness, a long-term beneficial impact.

Continued public education and outreach efforts by the Seashore could better inform the public about special status species recognition and protection. For example, brochures would continue to be released related to living with wildlife and would include information related to a variety of topics including colonial nesting birds. This information also would continue to be provided by interpretive rangers and other Seashore staff, as appropriate and would be posted on the Seashore's website and social media. Providing the public with ample information about special-status species could support better protection of these species within the Seashore, a long-term beneficial impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under each of the proposed alternatives, land-based vehicular access to the Seashore would be generally consistent with current conditions, including the use of vehicles along the beach in some areas. As described in "Chapter 3: Affected Environment," the Seashore is within the Atlantic Flyway, a major North American migratory bird route. The beaches at the Seashore provide important habitat for a variety of migratory and resident birds including special-status species. The recreational use of vehicles on Fire Island beaches would continue to minimally disrupt shorebirds that rely on the beach as their primary habitat for foraging and loafing. However, under Alternatives 2 and 3, the Seashore would collaborate with Fire Island communities and the towns of Islip and Brookhaven to develop a "driver's manual" that would educate residents, workers, and visitors about driving etiquette and getting around on Fire Island. If this manual includes information about beach driving, the adverse impacts summarized above could be minimized.

Transportation activities related to the bay and Atlantic Ocean within Seashore boundaries include private boats, fishing vessels, and ferries. Special-status species potentially affected by watercrafts include listed whales and sea turtles. While the deep-water aquatic habitat and reticence of marine animals makes them difficult to detect, unsuspecting impacts may occur from disturbances from motorcraft noise. These disturbances would have a negative, short-term impact on special-status aquatic species.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Seashore operations for all alternatives include a variety of actions, including construction and maintenance of facilities, monitoring of natural resources, enforcement, and visitor tours. For most of these actions, impacts to special-status species are not expected. Each of the proposed alternatives would include some level of routine maintenance of the existing boardwalks. Care would be taken to insure that special-status nesting birds are identified prior to introducing disturbances from boardwalk maintenance activities. When nests sites are known to be in close proximity to boardwalks, boardwalk maintenance activities would be restricted to the non-nesting season. In addition, to prevent potential harm to special-status birds and maritime plants, species populations would be identified with signage and fencing to prevent damage from ORV use and pedestrians. The overall impact is likely to be short-term, localized, and only slightly detectable. Maintenance activities around the Old Mastic House and at fields at the William Floyd Estate are not expected to impact special-status species.

SPECIAL-STATUS SPECIES

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact special-status species within the Seashore. These actions include dredging, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, and the Great South Bay Clam Restoration Project.

Routine dredging activities near Fire Island National Seashore to maintain channels within the Great South Bay and efforts associated with the Long Island Intracoastal Waterway Federal Navigation Project could periodically disturb special-status shorebird feeding areas. Once dredging activities are completed, temporarily disturbed shorebirds could return and continue to use the waterways.

Policies associated with the New York State Coastal Zone Management Plan changes are aimed at improving the state's coastal zones and the associated resources.

Many of the strategies proposed in the 2011-2016 assessment would benefit to special-status species habitat including updating the Significant Habitat Program, establishing a direct permit program for activities within State-designated Significant Coastal Fish and Wildlife Habitats, updating the NYS coastal policies to explicitly address marine debris and resource impacts, and developing phased amendments to the NYS CMP relative to habitat protection and criteria for siting wind energy generation and transmission facilities. Implementing these activities could result in a net increase in available high-quality habitat, and therefore a long-term beneficial impact on special status species.

The Long Island South Shore Estuary Reserve Comprehensive Management Plan provides the foundation for the long-term health of the Reserve's bays, tributaries, tidal wetlands, wildlife, tourism, and economy and supports a variety of associated projects. Efforts to protect and restore living resources and their associated habitats, including water quality conditions, could enhance marine and wetland habitats within the Seashore, a long-term beneficial impact to special-status species that utilize these habitats.

Suffolk County Vector Control is responsible for controlling mosquito populations that are of public health importance. The goal of the Vector Control and Wetland Management Plan, according to their mission statement, is to develop an effective long-term vector control program, minimize pesticide usage while protecting public health, and to preserve and restore wetlands managed by vector control. These wetlands provide habitat for a variety of wildlife species; therefore, improvements to the wetlands would benefit those special status species dependent on wetlands as a preferred habitat type.

The Great South Bay Clam Restoration working group was established by Suffolk County in 2008 to develop a sustainable management plan for the Great South Bay hard clam population. If the group's recommendations to reestablish and protect the hard clam population are implemented, then other marine wildlife resources could benefit from the improved habitat conditions within the Great South Bay, a long-term beneficial impact.

Generally, these past, present, and reasonably foreseeable future actions would result in a long-term beneficial impact on special-status species at the Seashore. When combined with the impacts of Alternative 1, the overall cumulative impacts would be long-term beneficial. Alternative 1 would contribute a noticeable beneficial increment but also contributes an adverse increment to the cumulative impacts on special-status species.

Conclusion

The individual elements of Alternative 1 would result in a range of both beneficial and adverse impacts on special-status species. Natural resource management components of Alternative 1 would generally have a long-term beneficial impact on special status species. This would primarily be related to protection of known plants and shorebird nesting areas via fencing and signage, and habitat restoration of critical habitat areas. However, some natural resource management efforts, such as land development actions also could result in adverse impacts on special-status species.

The continued human presence within the Seashore minimally disturbs wildlife, including camping and ORV use along the beaches, which is used by listed shorebirds for foraging and loafing. Short-term adverse impacts on special-status species would include disturbances from routine maintenance of existing facilities and infrastructure and human intervention to maintain natural resources and processes. Although continued disruptions to special- status species from infrastructure improvements and visitor presence would cause slightly detectable, localized adverse impacts, the overall impact would be long-term, beneficial due to the increase natural resource management activities.

The cumulative impact would be long-term beneficial, and Alternative 1 would contribute a noticeable beneficial increment to the overall cumulative impact.

Alternative 1 would have both adverse and beneficial impacts on special-status species but none of these impacts would be considered significant. Beneficial impacts would not be significant because the overall impact to vegetation (habitat) as summarized above, is small when considered within the context of the abundance and diversity of special-status species likely to use the habitat.

Land and development activities associated with Alternative 1 could cause adverse impacts to special-status species on Fire Island. These impacts could be minimized by implementing appropriate protection and conservation measures during these activities. In the context of the Seashore's mission to protect key habitat through land and natural resource management activities, the adverse impacts of Alternative 1 on special-status

species would not be considered significant because it is unlikely that impacts would affect the overall viability of the population of special-status species at the Seashore.

SPECIAL-STATUS SPECIES

IMPACTS OF ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

In addition to the impacts described in the "Common to All Actions" section, Alternative 2 would focus on restoration and enhancement of natural resources and processes. For example, the Seashore would work with its partners to pursue a proactive program of natural resource protection within the Seashore that would seek to restore degraded or damaged ecosystems, as feasible. Beyond the native vegetation restoration efforts common to all alternatives, under Alternative 2 the NPS would also develop and execute an aggressive strategy for eradication of invasive nonnative plant and animal species and the restoration of special-status species on federal lands through the most effective and environmentally sound means available. The NPS would collaborate with the Fire Island communities, the towns of Islip and Brookhaven, and Suffolk County to encourage similar efforts on non-federal lands within the Seashore. Efforts to restore habitats for special-status species and reduce invasive species would enhance the survivorship and expansion of listed plants and animals within the Seashore, a long-term beneficial impact.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

In addition to the impacts discussed in the "Common to All Alternatives" section, cultural resource management components of Alternative 2 with the greatest potential for affecting special-status species would be those focused on the William Floyd. The rehabilitation of existing features at the William Floyd Estate such as marshlands would improve available habitat for some species such as the dark-green sedge found in the tidal marsh. Cultural landscape restoration efforts that could temporarily disturb and/or remove existing vegetation to create cultural landscape vignettes and restore existing roads and trails are not expected to impact special-status species at the Estate. Over the long term, measures to maintain and rehabilitate the cultural landscape would result in a long-term, beneficial impact on special-status species.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with land-use and development components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. However, with a stronger focus on the natural environment and sustainability, Alternative 2 would reduce the development footprint at Seashore facilities (Talisman Beach, and Sailors Haven). At the end of their structural lifespan, buildings would be removed and the natural environment would be restored promoting habitats potentially usable by special- status species. The smaller development footprints would result in lower water usage and wastewater discharges into the groundwater, thereby reducing pollutant loads from reaching adjacent surface waters and marshes through groundwater seep. These actions would have a long-term beneficial impact on special status species that utilize these areas.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with Seashore experience, interpretation, education, and outreach components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. It is anticipated that Seashore visitation would be slightly lower than current levels under Alternative 2. A reduction in visitor usage would lower the risk of visitor disturbances to special-status species nesting, feeding, and loafing habitat. Similarly, as part of the Seashore efforts to restore and protect existing resources, visitor access could be restricted in some areas, slightly reducing impacts on special-status species through direct human contact.

In order to further enhance natural resource values under Alterative 2, the NPS would remove and/or consolidate some of the facilities at Sailors Haven/Sunken Forest, Talisman, and Watch Hill. At Watch Hill, the existing campground would be relocated to a more suitable area, allowing the existing area adjacent to the marsh to return to its naturally vegetated condition. The existing Wilderness Visitor Center also would be replaced with a smaller, simpler structure. Each of these actions

would reduce the footprint of manmade structures within the Seashore and provide opportunities for the restoration of special-status species habitat. The net expansion of natural areas would result in a long-term beneficial impact on special-status species.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, Alternative 2 would reduce the number of facilities at the Seashore (as described above), thereby reducing disturbances to special-status species' habitat. The removal of existing structures could result in restoration of habitat for colonial nesting birds and special-status plants. In addition, the removal of these structures over time may result in lower visitor attendance compared to the other alternatives. The reduced human presence associated with this alternative would decrease disturbances to special-status birds, including noise, pollution, and wildlife/human interactions. The restoration of coastal processes also would enhance wildlife habitat, especially for bayside estuaries used by wetland-dependent plant species and shorebirds.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact special-status species within the Seashore. As described under Alternative 1, these actions include dredging, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, and the Great South Bay Clam Restoration Project. When combining the beneficial and adverse impacts of these cumulative impacts with the impacts of Alternative 2, a long-term beneficial cumulative impact on special-status species would result. Alternative 2 would contribute a noticeable beneficial increment to the overall beneficial impact.

Conclusion

Alternative 2 would have both adverse and beneficial impacts on special-status species but none of these impacts would be considered significant. The beneficial impacts would be noticeable as the overall health of the vegetation is improved, but the abundance and diversity of special status species likely to use the habitat may not change to a noticeable degree. Adverse impacts on special status species would not permanently disrupt these species and precautions would be taken to avoid directly affecting these resources during improvements.

Land and development activities associated with Alternative 2 could cause adverse impacts to special-status species on Fire Island. These impacts could be minimized by implementing appropriate planning, protection and conservation measures to guide these activities. In the context of the Seashore's mission to protect key habitat through land and natural resource management activities, the adverse impacts of Alternative 2 on special-status species would not be considered significant because it is unlikely that impacts would affect the overall viability of the population of special-status species at the Seashore.

SPECIAL-STATUS SPECIES

IMPACTS OF ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section.

Consistent with the other alternatives, tick and mosquito surveillance and management efforts would continue within the Seashore. Vector management would be proactive, and treatment of high risk/ high use areas would occur on a regular schedule to ensure visitor health and safety and make a greater allowance for visitor comfort. Although these efforts would have a negligible impact on the wildlife population under the other alternatives, under Alternative 3 the Seashore would

implement low impact techniques to minimize impacts on other resources, such as water quality and wetland habitats potentially used by special-status species.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with cultural resource management actions would be the same as those described under "Impacts Common to All Alternatives."

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. However, under Alternative 3, the Seashore could experience a slight increase in visitation. The increased human presence could slightly increase disturbances to special-status species, particularly colonial shorebird nesting areas.

In addition, the total number of backcountry camping permits issued by the Seashore would increase, allowing more individuals to camp on the beach in front of the wilderness. Increased camping in these areas could heighten adverse impacts on habitat potentially available for special-status birds and plants. However, the Seashore would take steps to minimize adverse impacts on these resources by the installation of fencing and signage.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact special-status species within the Seashore. As described under Alternative 1, these actions include dredging, changes to the New York State CZMP, Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Suffolk County Vector Control and Wetlands Management Long-Term Plan, and the Great South Bay Clam Restoration Project. When combining the beneficial and adverse impacts of these cumulative impacts with the impacts of Alternative 3, a long-term beneficial cumulative impact on special-status species would result. Alternative 3 would contribute a noticeable beneficial increment to the overall beneficial impact.

Conclusion

Alternative 3 would have both adverse and beneficial impacts on special-status species but none of these impacts would be considered significant. The beneficial impacts would be noticeable as the overall health of the vegetation is improved, but the abundance and diversity of special status species likely to use the habitat may not change to a noticeable degree. Adverse impacts on special status species would not permanently disrupt these species and precautions would be taken to avoid directly affecting these resources during improvements.

Land and development activities associated with Alternative 3 could cause adverse impacts to special-status species on Fire Island. These impacts could be minimized by implementing appropriate planning, protection and conservation measures to guide these activities. In the context of the Seashore's mission to protect key habitat through land and natural resource management activities, the adverse impacts of Alternative 3 on special-status species would not be considered significant because it is unlikely that impacts would affect the overall viability of the population of special-status species at the Seashore.

CULTURAL RESOURCES

Impacts on Cultural Landscapes

Methodology

Cultural landscapes are the result of the long interaction between people and the land, and the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past as well as a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes, making them a good source of information about specific times and places, but at the same time rendering their long-term preservation a challenge.

In order for a cultural landscape to be listed on the National Register, it must possess significance (the meaning or value ascribed to the landscape) and integrity of those features necessary to convey its significance. The character-defining features of a cultural landscape include spatial organization and land patterns, topography, vegetation, circulation patterns, water features, structures/buildings, site furnishings, and objects. Cultural Landscape Inventories have been prepared for two cultural landscapes within the Seashore: Fire Island Light Station (2004) and the William Floyd Estate (2006). These inventories will provide the basis for analysis of these resource areas. Fire Island as a whole is also considered a cultural landscape, but no formal study has been completed to identify its significant and contributing features. A Historic Resource Study of Fire Island and its associated documentation completed in 1979 as well as a Community Character Analysis undertaken in 2010 will also contribute to the basis for this analysis.

Regulations and guidelines related to Cultural Landscapes include:

- Antiquities Act of 1906
- National Historic Preservation Act of 1966, as amended
- Advisory Council on Historic Preservation (ACHP) implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800)
- Executive Order 11593, "Protection and Enhancement of Cultural Environment"

- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- Secretary of the Interior Standards for the Treatment of Historic Properties (1996)
- NPS Management Policies 2006
- NPS Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources
- NPS Directors Orders (DO) #28 – Cultural Resources Management Guidelines

The resource-specific context for assessing the significance of impacts on cultural landscapes includes:

- Fire Island represents a cultural landscape that has been shaped both by human intervention and the forces of nature. In particular, the cultural landscapes associated with the Fire Island Light Station and the William Floyd Estate are considered fundamental resources of Fire Island National Seashore.
- The ability of a cultural landscape to continue to represent and convey historical events and themes determined to be fundamental to Fire Island National Seashore—these themes are related primarily to the environmental and human history of Fire Island, maritime history and economy, and Colonel William Floyd (one of New York's signers of the Declaration

of Independence) and the Floyd family's tenure as a reflection of the changing political, social and economic history of Long Island.

- The degree to which the National Register significance and integrity of the cultural landscapes that are considered fundamental resources is retained as the plan is implemented.
- The degree to which proposed management of cultural landscapes complies with section 110 of the National Historic Preservation Act regarding the preservation of historic properties to the maximum extent feasible.

CULTURAL LANDSCAPES

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under all Alternatives, a number of natural resource management proposals are likely to have an impact on cultural landscapes at the William Floyd Estate and on Fire Island. These proposed actions and initiatives include restoration of Sunken Forest, management of non-native invasive species, and proposed efforts to evaluate and address conditions related to natural light and soundscapes. These actions are all likely to result in the greater protection and preservation (either through rehabilitation or restoration) of character-defining features associated with the Seashore's cultural landscapes. However, care would be required in the management of deer and non-native invasive species to ensure that cultural landscape values are protected while attempting to meet natural resource management objectives.

Under all alternatives, the NPS would work to monitor and evaluate the effects of climate change and sea-level rise on both terrestrial and estuarine resources and would engage in the development of adaptive management strategies to address impacts particular to cultural landscapes within the Seashore. Until a CLR is completed that provides in-depth information on the composition of the landscape and its significance, the potential long-term effects of climate change and sea-level rise on the Seashore's cultural landscapes and the potential impact of these actions remain largely unknown.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under all Alternatives, the NPS would undertake research and documentation of federal cultural properties (Fire Island Light Station, Carrington Estate, William Floyd Estate), including the preparation of historic resource studies and cultural landscape reports. These research initiatives would provide the necessary guidance to understand, interpret, and treat the Seashore's currently identified cultural landscapes. These efforts are likely to result in the greater protection and preservation of character-defining features associated with the Fire Island Light Station and the William Floyd Estate through either rehabilitation or restoration.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

The NPS would collaborate with other Fire Island stakeholders to prepare a Coastal Land Use and Shoreline Management Plan. There would also be some reliance on a proposed new cooperative stewardship body to improve the process and provide a more inclusive voice in land-use and development decisions across Fire Island. To some degree, the ultimate effect of the cooperative stewardship body would depend on the model selected for implementation. However, the creation of such a body to foster collaboration, communication, and cooperation in addressing Island-wide issues would be likely to have a more beneficial impact on Fire Island's cultural landscape as a whole and would ensure a more holistic approach to its long-term protection.

Protecting the dynamic quality of the barrier island, community character, and the overall Fire Island experience would be among the underlying principles of the Coastal Land Use and Shoreline Management plan and implementation guidelines. This effort would be likely to result in enhanced awareness of cultural landscape values and greater protection and preservation of the Seashore's cultural landscape. However, some proposals necessary to make developed areas more resilient in response to sea-level rise and the threat of coastal storms could result in alterations to building design on Fire Island that would alter the historic character of some communities and NPS facilities, which could detract from the cultural landscape in certain areas.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

The extent and nature of impacts associated with Seashore experience, interpretation, education, and outreach would vary by alternative. Therefore, the impacts of the Seashore experience, interpretation, education, and outreach are unique to each alternative and are described in the alternative-specific sections below.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under all alternatives, the NPS would continue to support Fire Island's roadless environment through continued efforts to maintain the character of the system of boardwalks, sand roads, and other designated trails on federal lands; encouragement of water-based access to the island; and management of permits for driving. All of these transportation and access practices would sustain important characteristics that contribute to the cultural landscape of Fire Island. The proposed creation of a cooperative stewardship body to foster collaboration, communication, and cooperation in addressing Fire Island-wide issues like transportation and access would be likely to have a more beneficial impact on the Island's cultural landscape as a whole and would ensure a more holistic approach to its long-term protection.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, NPS would consider a number of approaches to foster the cooperative stewardship of Fire Island among stakeholders in a manner that relies on regular and meaningful communication among parties, coordination in issue resolution, and cooperation in action. This effort would result in a more comprehensive and holistic approach to resource management and enhance opportunities to address Fire Island-wide resources such as land use and development and Fire Island's cultural landscape.

The NPS would pursue efforts to make Seashore sites and facilities more universally accessible for the visiting public and its employees. In some cases, these efforts could alter the character of the cultural landscape (e.g., the introduction of a boardwalk).

CULTURAL LANDSCAPES

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 1, the Carrington Estate structures would be rehabilitated for administrative use and the associated landscape would be rehabilitated to ensure safe circulation and access to the structures. This action would create conditions for the long-term preservation of the cultural landscape at the Carrington Estate, a beneficial impact. At the William Floyd Estate, cultural landscape features would be preserved, though they would continue to be impacted by encroaching vegetation. The absence of a more aggressive management strategy for addressing encroaching vegetation would have a negative effect on the William Floyd Estate's cultural landscape overtime and would compromise its protection and the ability of Seashore staff to interpret it over the long term.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from land-use and development efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Under Alternative 1, the NPS would continue to review applications for variances, exceptions, etc. and provide written responses indicating whether or not proposals conform to the Secretary's Standards for Zoning. Findings and recommendations are frequently not adequately considered by local authorities, and developments that are not in compliance with the Secretary's zoning standards are permitted to occur.

NPS would continue to have limited tools to respond in cases of non-compliance. In some communities, this has resulted in an erosion of community character, particularly in the form of overscale development, which cumulatively would continue to affect the overall character of Fire Island and its cultural landscape.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under Alternative 1, the Seashore's visitor experience would continue to be segmented, with visitors to Seashore facilities largely staying within those facilities, and visitors to and local residents of the communities largely staying within their individual communities. This pattern of visitation influences how people experience Fire Island, leaving them with an incomplete understanding and appreciation of the diverse and dynamic quality of the place and the larger Fire Island landscape. This could result in limited support for its long-term preservation and ultimately the loss of important character-defining features.

At the William Floyd Estate, the core of the visitor experience would continue to be the Old Mastic House. Self-guided and guided walks of the Lower Acreage would continue to be available. Concerns about ticks and exposure to vector-borne diseases (e.g., Lyme Disease) would continue to discourage many visitors from experiencing the Estate as a whole. The lack of a comprehensive understanding and appreciation of the Estate's cultural landscape would make securing its protection more difficult and could be considered a long-term, adverse impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS, MAINTENANCE, AND FACILITIES ACTIONS

Impacts associated with the Seashore operations, maintenance and facilities of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on cultural landscapes beyond what is described under this alternative.

Conclusions

Overall, the proposed actions associated with Alternative 1 would have localized adverse effects and would have a long-term beneficial impact on cultural landscapes considered to be fundamental resources within Fire Island National Seashore. Natural resource management activities proposed under this alternative would offer substantial benefits relative to protecting the integrity of the cultural landscapes. However, some of the actions necessary to achieve natural resource management objectives could result in short-term adverse impacts to the cultural landscape such as those associated with the management of non-native invasive species. The completion of Cultural Landscape Reports for the Fire Island Light Station and the William Floyd Estate would be of long term benefit to these cultural landscapes by providing the necessary data and treatment recommendations to preserve the resource. Under this alternative, development in the Community Development District inconsistent with the Secretary's zoning standards is likely to continue, resulting in a gradual erosion of community character specific to the district, the overall character of Fire Island in general, and a long-term adverse impact to Fire Island's cultural landscape as a whole.

Based on this information, the beneficial impacts of Alternative 1 on cultural landscapes would not be considered significant. The adverse impacts on cultural landscapes considered fundamental resources within the Seashore may not be immediately apparent, however as the gradual alteration of Fire Island's character defining features continues cultural landscapes may be less able to represent and convey the Seashore's history and interpretive themes. If no mitigating action is taken, these impacts are likely to become more significant over time.

CULTURAL LANDSCAPES

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts on cultural landscapes from natural resource management efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 2, the NPS would engage in an aggressive strategy to eliminate non-native invasive species and to restore native plant species. In general, this would ensure their protection and would be of long-term benefit to cultural landscapes of Fire Island and the William Floyd Estate. However, care would be required to ensure that cultural landscape values are not compromised while attempting to meet natural resource management objectives.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Also under this alternative, the cultural landscape at the William Floyd Estate would be rehabilitated consistent with the recommendations of the proposed cultural landscape report and treatment plan. Relevant missing structures and features would be identified and interpreted. The existing landscape features characteristic of the Lower Acreage (e.g., fields, marsh, the vista, ponds, lopped trees, etc.) would be rehabilitated. Roads and trails would be rehabilitated to support additional recreational use. These actions would improve conditions for the long-term protection of these cultural landscapes and the Seashore's ability to interpret them. In sum, these actions are likely to be of long-term benefit to the cultural landscape at the William Floyd Estate.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from land use and development efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Under Alternative 2, NPS would collaborate with others to encourage, support, and cooperate with Fire Island communities to assist in the identification and preservation of the distinctive character of individual Fire Island communities as well as Fire Island as a whole. Efforts to raise awareness of the cultural landscape and the character-defining features of Fire Island would contribute positively to the long-term protection of these resources. This alternative also calls for the revision of the Secretary's zoning standards to make them clearer and better enable their consistent application and enforcement. As noted under Elements Common to All, this is one area that would benefit from the involvement of a cooperative stewardship body. In combination, they are likely to improve the management of land use and development across Fire Island and be of long-term benefit in preserving Fire Island's cultural landscape.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Similar to Alternative 1, the physical connection between Seashore facilities and Fire Island communities would continue to be limited or even diminished. This perpetuation of separation would continue to have an impact on the visitor's ability to understand and appreciate Fire Island as a whole and could result in limited support for its long-term preservation and ultimately the loss of important character defining features.

At the William Floyd Estate, the proposed introduction of landscape vignettes (reintroduction of gardens, cultivated fields) in support of interpretive objectives could foster a greater understanding and appreciation of the Estate's history and overall cultural landscape. The introduction of landscape vignettes would be undertaken consistent with documentation provided by the proposed cultural landscape report. However, the landscape vignettes may represent different periods in the Estate's history (e.g., cultivated fields representing the 18th-century plantation period in the midst of the 20th-century landscape) which may also disrupt the continuity of the cultural landscape and confound the visitor's ability to understand it.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on cultural landscapes beyond what is described under this alternative.

Conclusions

Similar to Alternative 1, the proposed actions associated with Alternative 2 would have a long-term beneficial impact on cultural landscapes within Fire Island National Seashore. The completion of Cultural Landscape Reports for the Fire Island Light Station and the William Floyd Estate would enhance management and protection of the Seashore's cultural landscapes. Under this alternative, efforts to revise the Secretary's zoning standards and to work with Fire Island's communities to address the protection of community character are likely to improve the management of land use and development on Fire Island and offer a long-term benefit for Fire Island's larger cultural landscape. Also under this alternative, greater emphasis would be placed on rehabilitation of the cultural landscapes at the Fire Island Light Station and the William Floyd Estate. These efforts coupled with those related to improved management of land use and development on Fire Island offer greater potential to protect the Seashore's cultural landscapes than those proposed under Alternative 1.

Based on this information, the beneficial impacts of Alternative 2 on cultural landscapes would be considered significant. The rehabilitation of cultural landscapes at the William Floyd Estate and Fire Island Light Station would be readily apparent and would be of long term benefit in protecting the integrity of these resources and ensuring that they continue to represent and convey the Seashore's history and interpretive themes.

CULTURAL LANDSCAPES

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under this alternative, the NPS would prepare a Fire Island-wide Cultural Landscape Report (CLR) that would provide essential information for evaluating, protecting, and interpreting Fire Island's larger landscape and place cultural landscapes like the Fire Island Light Station and the Carrington Estate in their larger context. The island-wide CLR would evaluate existing conditions and identify and analyze contributing landscape characteristics within the dynamic coastal environment. Also under this alternative, the NPS would work to strengthen its relationship with the academic community, local and regional museums, historical societies, and others to expand opportunities for collaboration in undertaking research, inventories, preservation initiatives, and interpretation. These enhanced relationships should contribute to expanded awareness of Fire Island's cultural heritage and its relationship to its regional context. In sum, these efforts would result in a greater understanding of these cultural landscapes and would contribute to their long-term protection.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

The cultural landscape impacts associated with Alternative 3 are the same as those described under Alternative 2.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. Unlike Alternatives 1 and 2, under Alternative 3, there would be greater emphasis on experiencing Fire Island as a whole. In addition to experiencing the Seashore's sites and facilities, visitors would also be presented with the opportunity to learn more about Fire Island's history and development through touring the Fire Island communities and participating in community-based and/or jointly developed programs (e.g., lectures, concerts, walking tours, and exhibits). Further, visitors would be encouraged to learn more about Fire Island's regional context by experiencing sites on Long Island such as Wertheim NWR, the Long Island Maritime Museum, and the Suffolk County Museum, to name a few. This would contribute to an increased awareness of the resource values associated with Fire Island and the defining features of the larger landscape and increased support for its long-term protection.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on cultural landscapes beyond what is described under this alternative.

Conclusions

Overall, the proposed actions associated with Alternative 3 would have localized adverse effects and would have a long-term beneficial impact on cultural landscapes within Fire Island National Seashore. The completion of Cultural Landscape Reports for the Fire Island Light Station, the William Floyd Estate and Fire Island as a whole would enhance management and protection of the Seashore's cultural landscapes. As under Alternative 2, efforts under Alternative 3 to revise the Secretary's zoning standards and to work with Fire Island's communities to address the protection of community character would be likely to improve the management of land use and development on Fire Island and offer a long-term benefit for Fire Island's cultural landscape. Also under this alternative greater emphasis would be placed on rehabilitation of the cultural landscapes at the Fire Island Light Station and the William Floyd Estate. The NPS would work to unify the visitor's experience of Fire Island improving awareness of Fire Island's larger landscape. These efforts offer the greatest potential of the three proposed alternatives to consider Fire Island's cultural landscape holistically and ensure its protection.

Based on this information, the largely beneficial impacts of Alternative 3 on cultural landscapes would be considered significant. The rehabilitation of cultural landscapes at the William Floyd Estate and Fire Island Light Station would be readily apparent and would be of long-term benefit in protecting the integrity of these resources and ensuring that they continue to represent and convey the Seashore's history and interpretive themes. The completion of a Fire Island-wide Cultural Landscape Report opens opportunities to support and enable others to acknowledge, protect, and interpret the contributing features associated with the island's cultural landscape, the results of which would be readily apparent.

CULTURAL RESOURCES

Impacts on Historic Structures

Methodology

In order for a structure or building to be listed on the National Register, it must be associated with an important historic context, i.e., possess significance – the meaning or value ascribed to the structure or building, and integrity of those features necessary to convey its significance (i.e., location, design, setting, workmanship, materials, feeling, and association). The Fire Island Lighthouse was listed on the National Register of Historic Places in 1981; an update and boundary expansion to include the entire Fire Island Light Station as a district was listed in 2010. The Old Mastic House at the William Floyd Estate was listed on the National Register of Historic Places in 1980. Funds are currently being sought by the Seashore to update the National Register paperwork to include the entire William Floyd Estate. The Carrington House and Cottage were listed on the National Register by the New York State Historic Preservation Office (SHPO) in January 2014. Each of the National Register nominations delineates significant and contributing features and serves as the basis for the analysis of impacts in this section. In the absence of the updated paperwork for the William Floyd Estate, the 2006 Cultural Landscape Inventory will also be used as a basis for this analysis.

Regulations and guidelines related to Historic Structures include:

- Advisory Council on Historic Preservation (ACHP) implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800)
- Antiquities Act of 1906
- Historic Sites, Buildings, and Antiquities Act of 1935, as amended
- National Historic Preservation Act of 1966, as amended
- Executive Order 11593, "Protection and Enhancement of Cultural Environment,"
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- Secretary of the Interior Standards for the Treatment of Historic Properties (1996)

- NPS Management Policies 2006
- NPS Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources
- NPS Directors Orders (DO) #28 – Cultural Resources Management Guidelines

The resource-specific context for assessing significance of impacts on historic structures includes:

- The historic buildings and structures associated with the Fire Island Light Station, and the William Floyd Estate are considered to be fundamental resources of Fire Island National Seashore.
- The ability of a historic buildings and structures to continue to represent and convey historical events and themes determined to be fundamental to Fire Island National Seashore: these themes are related primarily to the environmental and human history of Fire Island, maritime history and economy, Colonel William Floyd (one of New York's signers of the Declaration of Independence) and the Floyd family's tenure as a reflection of the changing political, social, and economic history of Long Island.
- The degree to which the National Register significance and integrity of historic buildings and structures that are considered fundamental resources is retained as the plan is implemented.
- The degree to which proposed management of historic buildings and structures complies with section 110 of the National Historic Preservation Act regarding the preservation and use of historic properties to the maximum extent feasible.

HISTORIC STRUCTURES

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the natural resource management components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, NPS would undertake research and National Register documentation of historic properties at the William Floyd Estate, Sailors Haven, and the Carrington Estate. These efforts would serve to better inform management of the historic structures associated with these properties. At the William Floyd Estate, the Seashore would complete work on the stabilization of the Old Mastic House and continue to preserve and interpret the Estate's historic outbuildings. The historic caretaker's workshop would continue to serve as administrative space, a use consistent with its historic purpose. These actions would be of benefit to the Seashore's historic structures and would result in their long-term protection.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

No impacts associated with the land-use and development components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

No impacts associated with the Seashore experience, interpretation, education and outreach components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

No impacts associated with the transportation and access components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, the NPS would pursue efforts to make Seashore sites and facilities more universally accessible for the visiting public and its employees. The Seashore would also work to make Seashore facilities more energy efficient and sustainable. In some cases, these efforts could alter the character of a historic structure. The Seashore would seek alternatives to the alteration of historic structures for these purposes where possible.

HISTORIC STRUCTURES

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 1, historic structures would continue to be preserved and maintained at the Fire Island Light Station and the William Floyd Estate. The Carrington house and cottage would be rehabilitated and adaptively reused for administrative purposes. The continued maintenance and use of these structures would ensure their long-term preservation.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from land-use and development efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, in many cases historic structures located on non-federal lands within the Seashore would remain undocumented and may be affected by insensitive alterations, additions, demolition, or may be located in high-hazard areas. Such historic structures may be subject to permanent loss over time. This could gradually erode the context within which the federal historic structures exist, resulting in adverse impacts on the federal historic properties.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under this alternative, the NPS would rehabilitate the Sailors Haven Visitor Center consistent with the findings of the proposed National Register documentation. At the William Floyd Estate, orientation and sales space would continue to be located inside the Old Mastic House. These uses are not consistent with the historic use of the historic structure, detract from the visitor's experience of the Old Mastic House, and could have a long-term negative impact on the historic structure.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from Seashore operations, maintenance, and facilities efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Also under this alternative, the NPS would rehabilitate the Carrington House and Cottage and adaptively reuse them for administrative purposes. For several years, these structures had been left unused and minimally maintained. The rehabilitation and use of the structures would ensure their long-term preservation.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on historic structures beyond what is described under this alternative.

Conclusions

Overall, the proposed actions associated with Alternative 1 would have localized adverse impacts and would have a long-term beneficial impact on historic structures within Fire Island National Seashore. This is due to efforts to maintain and preserve the historic structures and the rehabilitation of the Carrington house and cottage. The use of spaces in the Old Mastic House for sales and orientation would continue to be inconsistent with the historic use of the structure and would have a minor, long-term impact on the structure's historic integrity. The lack of information pertaining to the historic structures that are located throughout the Fire Island communities and the potential for their loss or alteration may gradually diminish the larger context in which the Seashore's historic structures exist. This could have a long-term, adverse impact on historic structures within the Seashore.

Based on this information, the largely beneficial impacts of Alternative 1 on historic structures would not be considered significant. Under this alternative, the present preservation and maintenance regimens for the Seashore's historic structures and efforts to rehabilitate the Carrington house and cottage would be slightly detectable and historic structures would be minimally affected. The adverse impacts associated with continued use of the Old Mastic House for orientation and sales, and limited information about and protection of non-federal historic structures across Fire Island would not be immediately apparent and therefore would not be considered significant. Changes to the larger context of the Seashore's historic structures from loss and alteration of structures located throughout the communities would not be considered significant in the near term because of the incremental nature of the change. Over time, the continuing gradual alteration of context and setting could have a significant impact on the integrity of the Seashore's historic structures.

HISTORIC STRUCTURES

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. At the William Floyd Estate, the orientation and sales functions would be removed from the Old Mastic House and the remaining spaces would be refurnished to reflect their historic use. This proposed action would be of long-term benefit in the preservation and interpretation of the Old Mastic House. In addition, the Estate's historic outbuildings would be rehabilitated and interpreted. This proposed preservation treatment would also be of long-term benefit to the historic structures.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from land use and development efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, NPS would collaborate with others to encourage, support, and cooperate with Fire Island communities to assist in the identification and preservation of the distinctive character of individual Fire Island communities as well as Fire Island as a whole. Efforts to raise awareness of historic structures and recognition of their importance to Fire Island's historic use and development would contribute positively to the long-term protection of these resources. It would also benefit the federally managed historic structures by preserving some facets of their historic context.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Also under this alternative, the NPS would rehabilitate the Sailors Haven Visitor Center for continued visitor use. Documentation would also be completed to evaluate the structure's National Register eligibility. These proposed actions would support its preservation and be of long-term benefit to the historic structure. At the William Floyd Estate, tours of the Old Mastic House would be ticketed and scheduled to manage the flow and volume of visitors through the house. This proposed action would manage visitation to be consistent with the structures carrying capacity, thus minimizing impacts and being of long term-benefit to the Old Mastic House. In addition, the NPS would expand existing visitor facilities to accommodate flexible program space for visitor orientation as well as space for visitor contact and sales, moving these functions away from the historic Old Mastic House.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section. As in Alternative 1, under this alternative the NPS would rehabilitate the Carrington House and Cottage and reuse them for administrative purposes. For several years, these structures had been left unused and minimally maintained. Rehabilitation and reuse ensures their long-term preservation.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on historic structures beyond what is described under this alternative.

Conclusions

The proposed actions associated with Alternative 2 would have localized adverse impacts and would have a long-term beneficial impact on historic structures considered to be fundamental resources within the Seashore. Efforts to document and rehabilitate historic structures at Sailors Haven and the William Floyd Estate would be of long-term benefit to the Seashore's historic structures. Likewise, proposals to relocate non-historic functions from the Old Mastic House to a more appropriate location would also be considered of long-term benefit in terms of the protection of historic structures.

Based on this information, the beneficial impacts of Alternative 2 on historic structures would be considered significant. Under this alternative, proposed rehabilitation efforts, and the relocation of non-historic functions from historic buildings would be detectable and historic structures would be noticeably improved and better preserved by these actions. The proposed actions would enhance the ability of these fundamental and important resources to represent and convey historical events and themes and better ensure their historical integrity.

HISTORIC STRUCTURES

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

There would be no impacts on historic structures as a result of natural resource management proposals under Alternative 3.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 3, the NPS would work collaboratively with the New York SHPO and interested Fire Island communities to undertake a formal inventory of historic resources on non-federal lands within the boundary of the Seashore. The proposed efforts to inventory and document other historic properties on Fire Island could ultimately improve their prospects for long-term protection and would contribute to the preservation of the larger historic context of the federally-owned historic structures. This would be of long-term, benefit to the Seashore's historic structures.

As in Alternative 2, the orientation and sales functions would be removed from the Old Mastic house at the William Floyd Estate, and the remaining spaces would be refurnished to reflect their historic use. This proposed action would be of long-term benefit in the preservation and interpretation of the Old Mastic House. In addition, the Estate's historic outbuildings would be rehabilitated and interpreted. This proposed preservation treatment would also be of long-term benefit to the Seashore's historic structures.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from land use and development efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. Also, as in Alternative 2, under this alternative the NPS would collaborate with others to encourage, support, and cooperate with Fire Island communities to assist in the identification and preservation of the distinctive character of individual Fire Island communities as well as Fire Island as a whole. Efforts to raise awareness of historic structures and their importance to Fire Island's historic use and development will contribute positively to the long-term protection of these resources and to the preservation of the larger historic context of the federally owned historic structures. This would be of long-term benefit to the Seashore's historic structures.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. As in Alternative 2, under this alternative, the NPS would rehabilitate the Sailors Haven Visitor Center for continued visitor use. Documentation would also be completed to evaluate the structure's National Register eligibility. These proposed actions would support its preservation and be of long term benefit to the historic structure. At the William Floyd Estate, tours of the Old Mastic House would be ticketed and scheduled to manage the flow and volume of visitors. This proposed action would manage visitation to be consistent with the structures carrying capacity, thus minimizing impacts and being of long-term benefit to the Old Mastic House. In addition, the NPS would expand existing visitor facilities to accommodate flexible program space for visitor orientation as well as space for visitor contact and sales, thus removing these functions from the historic Old Mastic House.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Similar to Alternative 1, under this alternative, the NPS would rehabilitate the Carrington House and Cottage and adaptively reuse them for administrative purposes. The Seashore would use one or both of these structures to host an artist-in-residence program. For several years, these structures had been left unused and minimally maintained. Rehabilitation and reuse ensures their long-term preservation.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on historic structures beyond what is described under this alternative.

Conclusions

Overall, the proposed actions associated with Alternative 3 would have localized adverse impacts and would have a long-term beneficial impact on historic structures considered to be fundamental resources within Fire Island National Seashore. Proposals to rehabilitate and reuse or interpret historic structures at the Carrington Estate, Sailors Haven, and the William Floyd Estate all directly support their long-term protection and preservation. Likewise, proposals to relocate non-historic functions from the Old Mastic House to a more appropriate location would also be considered to be of long-term benefit from a historic structures standpoint. Efforts to encourage the recognition and protection of historic structures on non-federal lands within the Seashore would contribute to the protection of the historic context that helps define the Seashore's cultural resources. These efforts woud result in a long-term benefit relative to the preservation of historic structures on the federal tracts.

Based on this information, the largely beneficial impacts of Alternative 3 on historic structures would be considered significant. Under this alternative, proposed rehabilitation efforts and the relocation of non-historic functions from historic buildings would be detectable and historic structures would be noticeably improved and better preserved by these actions. The proposed actions would enhance the ability of these fundamental and important resources to represent and convey historical events and themes and better ensure their historical integrity.

CULTURAL LANDSCAPES

Impacts on Archeological Resources

Methodology

Certain important research questions about human history can be answered only by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions. An archeological site can be eligible for the National Register if the site has yielded, or may be likely to yield, information important in prehistory or history. An archeological site can be nominated to the National Register in one of three historic contexts or levels of significance: local, state, or national. An archeological overview and assessment was completed for the Seashore in 2005. That delineation of significant and contributing features is the basis for the analysis of impacts in this section.

Regulations and guidelines related to archeological resources include:

- Curation of Federally Owned and Administered Archeological Collections (36 CFR 79)
- Advisory Council on Historic Preservation (ACHP) implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800)
- National Historic Preservation Act of 1966, as amended
- Archeological and Historic Preservation Act of 1974, as amended
- Archeological Resources Protection Act of 1979, as amended
- Native American Graves Protection and Repatriation Act of 1990
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- Secretary of the Interior Standards for the Treatment of Historic Properties (1996)
- NPS Management Policies 2006

- NPS Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources
- NPS Directors Orders (DO) #28 – Cultural Resources Management Guidelines
- NPS Directors Orders (DO) # 28A – Archeology

The resource-specific context for assessing the significance of impacts under NEPA includes:

- The ability to provide meaningful information to the Seashore's archeological record and provide opportunities for archeological research.
- The degree to which the management of archeological resources complies with the National Historic Preservation Act.
- The degree to which the management of archeological resources is consistent with the recommendations of the 2005 Archeological Overview and Assessment prepared for Fire Island National Seashore.

ARCHEOLOGICAL RESOURCES

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the natural resource management components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the NPS would undertake the necessary research to set priorities and formulate a strategy for archeological resource management. Research would include work related to prehistoric archeological resources, resources at risk from coastal erosion, and submerged archeological resources. These proposed initiatives would enhance efforts to protect these resources and would be of long-term benefit to the archeological resources on Fire Island and the William Floyd Estate.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

No impacts associated with the land-use and development components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

No impacts associated with the Seashore experience, interpretation, education, and outreach components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

No impacts associated with the transportation and access components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, the NPS would construct a solar shade structure over some or all of the Ferry Terminal parking area. This may result in the disturbance of archeological resources located beneath the parking area.

ARCHEOLOGICAL RESOURCES

IMPACTS OF MANAGEMENT ALTERNATIVE 1

No Action

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on archeological resources beyond what is described under this alternative.

Conclusions

As described in "Impacts Common to All Alternatives", Alternative 1 would result in beneficial impacts to archeological resources and some localized, minimal, adverse impacts. These actions include the inventory and documentation of prehistoric and submerged archeological resources and an analysis of archeological resources that may be threatened by coastal erosion. These efforts to locate archeological resources would contribute to their long-term protection and would be considered a long-term benefit to archeological resources.

While the actions described under Alternative 1 would have a beneficial impact on archeological resources they do not represent a substantial change in how the Seashore manages its archeological resources. Therefore, these beneficial impacts would not be considered significant in the context of the Seashore's archeological record or opportunities for research, the preservation of archeological resources, or the recommendations of the 2005 Archeological Overview and Assessment. Adverse impacts associated with construction or other ground disturbing activity would be slightly detectable and highly localized, and therefore would not be considered significant in the context of preserving archeological resources. In cases of construction or other ground disturbing activity, the Seashore would undertake standard mitigation measures such as pre-construction surveys and monitoring during construction to best protect the integrity of archeological resources. Mitigating measures would be consistent with the recommendations of the 2005 Archeological Overview and Assessment and could contribute to opportunities for research.

ARCHEOLOGICAL RESOURCES

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 2, the NPS would undertake a comprehensive archeological resource management plan for the William Floyd Estate. This would enhance the Seashore's ability to consistently manage for the inventory, monitoring, protection and, as appropriate, interpretation of the archeological resources. This proposed action would be of benefit to the Seashore's archeological resources.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, a number of facilities would be identified for removal. At most locations (Sailors Haven, Talisman, and Wilderness), the sites were heavily affected by existing development and further activity would be unlikely to have an impact on archeological resources.

Also under this alternative, a new visitor orientation facility would be developed by expanding upon existing facilities at the William Floyd Estate, thus increasing the building footprint and possibly requiring the reconfiguration of the existing parking area. Though this is a previously disturbed site, there is still the potential to impact archeological resources. Further assessment would be required. This proposed action could have an adverse impact on the archeological resources in the project area.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from Seashore operations, maintenance, and facilities efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. At the William Floyd Estate, a consolidated maintenance facility would be developed on previously disturbed soils and would expand upon preexisting structures. This proposal may also result in adverse impacts to archeological resources.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on archeological resources beyond what is described under this alternative.

Conclusions

Under Alternative 2, some proposed actions may adversely impact archeological resources including the demolition of some existing structures and the rehabilitation and expansion of others, and the proposed construction of solar car ports at the Patchogue Ferry Terminal. These impacts would all be highly localized and are likely to be minor in their impact because so much of the proposed activity would occur in previously disturbed areas. The completion of a comprehensive archeological management plan at the William Floyd Estate would contribute to mitigating these impacts.

Alternative 2 would have a beneficial impact on archeological resources however the greatest benefits would be derived at the William Floyd Estate. On Fire Island they do not represent a substantial change in how the Seashore manages its archeological resources on Fire Island. However, the completion and implementation of a comprehensive archeological management plan for the William Floyd Estate could result in beneficial impacts that are significant in the context of preserving the Seashore's archeological record and opportunities for research, preserving archeological resources, and the recommendations of the 2005 Archeological Overview and Assessment. In cases of construction or other ground disturbing activity, the Seashore would undertake standard mitigation measures such as pre-construction surveys and monitoring during construction to best protect the integrity of archeological resources park-wide. Adverse impacts associated with construction or other ground disturbing activity would be slightly detectable and highly localized, and therefore would not be considered significant in the context of preserving archeological resources. Mitigating measures would be consistent with the recommendations of the 2005 Archeological Overview and Assessment and could contribute to opportunities for research. In addition, once completed, the Archeological Resource Management Plan for the William Floyd Estate would provide additional guidance for mitigating future impacts at the Estate.

ARCHEOLOGICAL RESOURCES

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. As under Alternative 2, the NPS would undertake a comprehensive archeological resource management plan for the William Floyd Estate. This would enhance the Seashore's ability to consistently manage for the inventory, monitoring, protection, and, as appropriate, interpretation of the archeological resources. This proposed action would be of benefit to the Seashore's archeological resources. In addition, under this alternative, NPS would work collaboratively with the SHPO and interested Fire Island communities to undertake a formal inventory of historic resources including archeological resources. NPS would also work with Fire Island communities to make them aware of archeological resources and encourage them to document and protect them. These actions would all be of long-term benefit to archeological resources throughout the Seashore.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. As under Alternative 2, a new visitor orientation would be developed by expanding upon existing facilities at the William Floyd Estate, thus increasing the building footprint and possibly requiring the reconfiguration of the existing parking area. Though this is a previously disturbed site, there is still the potential to impact archeological resources; further assessment would be required. This proposed action could have an adverse impact on the archeological resources in the project area.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from Seashore operations, maintenance, and facilities efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. As proposed under Alternative 2, under this alternative a consolidated maintenance facility would be developed at the William Floyd Estate on previously disturbed soils and would expand upon a preexisting structure. Likewise, the nearby curatorial storage facility would also be expanded resulting in similar impacts. This proposal could result in adverse impacts to archeological resources.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on archeological resources beyond what is described under this alternative.

Conclusions

Alternative 3 would result in both beneficial and adverse impacts on archeological resources. Of benefit would be the completion of a comprehensive archeological management plan at the William Floyd Estate; inventory and documentation of prehistoric and submerged archeological resources and an analysis of archeological resources that may be threatened by coastal erosion; and proposed work to support the inventory, documentation, and protection of archeological resources on non-federal lands on Fire Island. These efforts would contribute positively to the long-term protection of archeological resources at the William Floyd Estate and across Fire Island. Construction projects at the William Floyd Estate and proposed construction in the parking area of the Patchogue Ferry Terminal could result in adverse impacts to archeological resources that would require some mitigation in compliance with federal laws and policies.

Similar to Alternative 1, the actions described under Alternative 3 would have a beneficial impact on archeological resources they do not represent a substantial change in how the Seashore manages its archeological resources on Fire Island. However, the completion and implementation of a comprehensive archeological management plan for the William Floyd Estate and efforts to work with Fire Island communities to identify and protect archeological resources could result in beneficial impacts that are significant in the context of preserving the Seashore's archeological record and opportunities for research, preserving archeological resources, and the recommendations of the 2005 Archeological Overview and Assessment. In cases of construction or other ground disturbing activity, the Seashore would undertake standard mitigation measures such as pre-construction surveys and monitoring during construction to best protect the integrity of archeological resources park-wide. Adverse impacts associated with construction or other ground disturbing activity would be slightly detectable and highly localized, and therefore would not be considered significant in the context of preserving archeological resources. Mitigating measures would be consistent with the recommendations of the 2005 Archeological Overview and Assessment and could contribute to opportunities for research.

CULTURAL RESOURCES

Impacts on Museum Collections

Methodology

Museum collections (historic artifacts, natural specimens, and archival and manuscript material) may be threatened by fire, theft, vandalism, natural disasters, and environmental conditions, such as relative humidity, temperature, light, etc. The preservation of museum collections is an ongoing process of preventative conservation, supplemented by conservation treatment when necessary. The primary goal is preservation of artifacts in as stable a condition as possible to prevent damage and minimize deterioration. The Seashore's archives and collection are characterized in a 1991 Scope of Collections Statement. Recommendations for a Scope of Collections update were made in the 2006 Collection Management Plan prepared for the Seashore. The findings contained in these documents form the basis for the analysis of impacts in this section.

Regulations and guidelines related to museum collections include:

- Curation of Federally Owned and Administered Archeological Collections (36 CFR 79)
- Advisory Council on Historic Preservation (ACHP) implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800)
- Antiquities Act of 1906
- Historic Sites Act of 1935, as amended
- Museum Properties Management Act of 1955, as amended
- National Historic Preservation Act of 1966, as amended
- Archeological and Historic Preservation Act of 1974, as amended
- Archeological Resources Protection Act of 1979
- Native American Graves Protection Repatriation Act of 1990
- Executive Order 11593, "Protection and Enhancement of the Cultural Environment"
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- Secretary of the Interior Standards for the Treatment of Historic Properties (1996)
- NPS Management Policies 2006
- NPS Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources
- NPS Director's Orders (DO) #24 – Museum Collections Management
- NPS Director's Orders (DO) #28 – Cultural Resources Management Guidelines
- NPS Director's Orders (DO) # 28A – Archeology
- NPS Museum Handbook

The resource-specific context for assessing the significance of impacts on museum collections includes:

- The Seashore maintains a museum and archival collection that includes over 100,000 items that pertain to both the William Floyd Estate and Fire Island that has been recognized as a fundamental resource.
- The degree to which the Seashore's museum and archival collections are maintained in good condition and are readily available to the public consistent with regulations and guidelines related to museum collections, as described above.
- The degree to which the management of museum collections is consistent with the recommendations of the 2006 Collections Management Plan prepared for Fire Island National Seashore, as well as the Northeast Region and service-wide Collection Management Plans.

MUSEUM COLLECTIONS

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

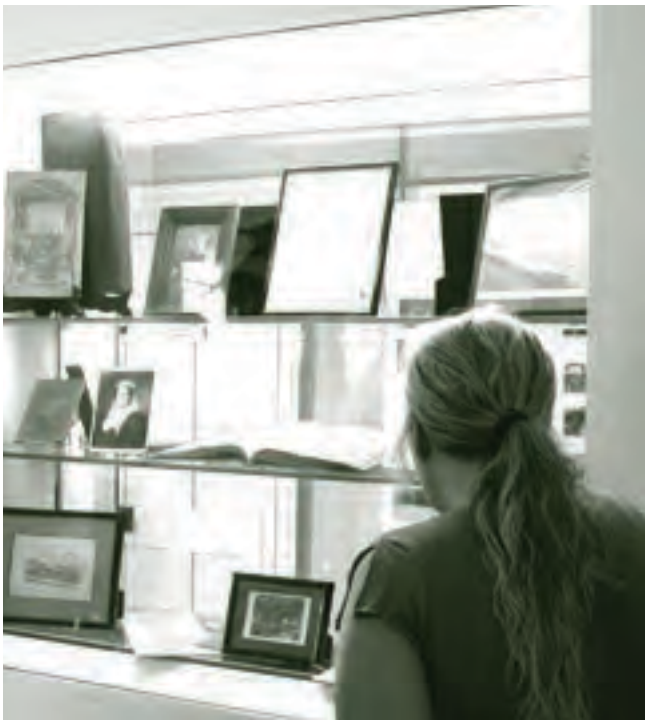
No impacts associated with the natural resource management components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the NPS would work to make the collection more readily available to the public and educational entities for research and interpretive use, including digitizing segments of the collection and making them available on-line. Increasing public awareness of the collection and making it available to the general public as well as researchers could result in both beneficial and adverse impacts. Promoting the understanding and appreciation of the collection is a benefit; on the other hand, increasing demand for its physical availability could result in increased wear on objects in the collection. The Seashore would need to update security and use procedures to address any significant changes in the pattern of use. At the William Floyd Estate, a historic furnishings implementation plan would be prepared to guide the placement and management of the furnishings on exhibit in the Old Mastic House, which would be of long-term benefit to the museum collection by ensuring its proper care and protection. Further, the NPS would continue to work with Floyd family descendants and others related to the site to enhance the Estate's collections.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

No impacts associated with the land-use and development components of the Elements Common to All Alternatives were identified.



▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under all alternatives, the Seashore would continue to offer special programs and temporary exhibits in support of interpretive objectives at the William Floyd Estate. Objects would continue to be displayed in secure, climate-controlled cases as required. Temporary exhibits would continue and would enable the Seashore to make segments of the collection available for viewing that otherwise would be unavailable. This would foster greater public understanding and appreciation of the Seashore's collection and could elicit greater public support for its protection.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

No impacts associated with the transportation and access components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

No impacts associated with the Seashore operations, maintenance, and facilities components of the Elements Common to All Alternatives were identified.

MUSEUM COLLECTIONS

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 1, the NPS would continue to house collections in their present locations, some of which are not climate controlled. The Seashore's curatorial facility would continue to function at capacity. Offers of additional museum objects and archival materials may need to be declined due to inadequate storage space and conditions. Workspace for conservation and research activities would continue to be at a premium. While largely stable, current conditions make the collection less accessible and more difficult to manage which overtime could result in long-term adverse impacts to the Seashore's museum collections.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach efforts associated with Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, the curatorial staff would continue to provide assistance and offer limited tours of the curatorial facility, as feasible. These efforts would contribute to enhanced understanding and appreciation of the Seashore's museum collections and overall would offer a net benefit relative to the long-term protection of the collection. Care would need to be taken to ensure that security and use protocols are in place to protect the collection. Opening up the present small curatorial space for guided tours could present a limited threat to the collection in terms of damage or theft.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on museum collections beyond what is described under this alternative.

Conclusions

Under Alternative 1 impacts to museum collections would have both beneficial and adverse impacts. Perpetuating existing collections storage conditions that fail to address storage, research, and workspace needs would make it increasingly difficult to maintain the collection, resulting in noticeable adverse impacts to museum collections.

The beneficial impacts of Alternative 1 on Museum Collections would not be considered significant because only a small portion of the items would be affected. The adverse impacts would not be significant in the short term, as there would be no substantive changes to the collections; however, over time, the lack of improvement in conditions regarding storage and use of the collections could result in significant impacts to museum collections.

MUSEUM COLLECTIONS

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. The existing interior space of the curatorial storage facility would be reorganized and refurnished to maximize use of the space. While this would expand and improve collections storage, workspace for conservation and research activities would continue to be at a premium. Objects from the collection would continue to appear in temporary exhibits and curatorial staff would continue to provide assistance to researchers. Care would need to be taken to ensure that security and use protocols are in place to protect the collection. These proposed actions would result in long-term benefits to museum collections in terms of their storage and protection. Long-term impacts would persist due to limitations on curatorial workspace and access for researchers.

IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education, and outreach actions associated with Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, the curatorial staff would continue to provide assistance to researchers and offer limited tours of the curatorial facility, as feasible. The Seashore would continue to mount temporary exhibits at the William Floyd Estate, but under this alternative, the exhibits would be housed in the proposed orientation facility. The proposed reorganization and refurnishing of the existing storage facility could improve conditions for guided tours, reducing concerns about potential theft or damage. These efforts would contribute to enhanced understanding and appreciation of the Seashore's museum collections and overall offer a net benefit. Care would need to be taken to ensure that security and use protocols are in place to protect the collection.

IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on museum collections beyond what is described under this alternative.

Conclusions

Under Alternative 2, impacts to museum collections would be both beneficial and adverse. Reorganizing and refurnishing the existing interior space of the curatorial storage facility to maximize the use of the space would expand and improve collections storage; however, workspace for conservation and research activities would continue to be at a premium. While there are significant benefits to the museum collection associated with improved storage, there would also continue to be long-term adverse impacts to museum collections because of limited workspace. The reorganization and refurnishing of the curatorial storage space could also improve the environment for guided tours, reducing the risk of theft and damage to museum collections. Updating temporary exhibit furnishings would also be of long-term benefit to the protection of museum collections.

Based on this information, the largely beneficial impacts of Alternative 2 on Museum Collections would be considered significant because there would be substantive improvements in the conditions for storage and use of the collections, consistent with the recommendations and applicable policies and guidelines. Similar to Alternative 1, the adverse impacts associated with this alternative – particularly the continued lack of workspace-- would not be considered significant over the short-term, but the continued absence of suitable workspace for the conservation and care of the collection will eventually result in a significant impact because museum objects and archival materials would continue to transported from the site in order to undergo conservation. Such actions could increase the odds of artifacts being lost or damaged in transit.

MUSEUM COLLECTIONS

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from cultural resource management efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, the NPS would work with individual and local groups possessing relevant museum and archival collections to encourage the conservation of those collections and consider ways to make them more available to a wider audience. Such efforts could include holding educational workshops and mounting temporary exhibits. These efforts would promote an awareness of the historical importance of these Fire Island-related collections, encourage their long-term protection, and make them available to the general public and researchers. Some of these privately held collections could be temporarily displayed at Seashore facilities. While these proposed actions would not directly impact the Seashore's present museum collection, they would enhance the protection of and public access to important related collections relevant to Fire Island. Overall, this would be of long-term benefit to the Seashore's museum collections.

Under Alternative 3, the existing storage facility would be reorganized and expanded to meet the Seashore's curatorial storage needs, including sufficient work and research space. This would enable the Seashore to provide climate-controlled storage to some of the objects presently stored elsewhere in the park. Appropriate work and research spaces would improve conditions for on-site curation of objects in the collection and provide a better, more secure environment for researchers. Finally, the larger reorganized space would provide an

improved environment for conducting guided tours of the collection facility. The collection would be further highlighted through the installation of exterior panels near the curatorial storage building that describe the scope and content of the collection. In sum, these proposed actions would be of long-term benefit to the Seashore's museum collections.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from Seashore experience, interpretation, education and outreach efforts associated with Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under Alternative 3, the curatorial staff would continue to offer limited tours of the curatorial facility, as feasible. The larger, reorganized curatorial storage space proposed under this alternative would provide an improved environment for conducting guided tours of the curatorial storage facility. The collection would be further highlighted through the installation of exterior panels near the curatorial storage building that describe the scope and content of the collection. As under Alternative 2, the Seashore would continue to mount temporary exhibits at the William Floyd Estate that would be housed in the proposed orientation facility. These activities encourage an awareness and appreciation of the Seashore's museum collection that could result in increased support for and public use of the collection. These proposed actions would be of long-term benefit to the Seashore's museum collection.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on museum collections beyond what is described under this alternative.

Conclusions

Under Alternative 3, impacts to museum collections would be of overall benefit to the Seashore's museum collections. The expansion and reorganization of the existing curatorial storage facility would expand and improve collections storage, as well as workspace for conservation and research activities. The expanded facility would also facilitate NPS efforts to work with Fire Island communities and others to identify, document, and protect Fire Island-related collections. The expansion and reorganization of the curatorial storage space could also improve the environment for guided tours, reducing the risk of theft and damage to museum collections. Updating temporary exhibit furnishings at the William Floyd Estate would also be of benefit to the protection of museum collections.

For these reasons, the beneficial impacts of Alternative 3 on Museum Collections would be considered significant.

Impacts on Wilderness

Methodology

With the passage of the Otis Pike Fire Island High Dune Wilderness Act (PL 96-585) on December 23, 1980, Congress established approximately 1,363 acres of wilderness and 18 acres of potential wilderness within Fire Island National Seashore. Subsequently, in October 1999, 17 of the 18 acres designated as potential wilderness were deemed to be in full compliance with wilderness standards and officially designated as wilderness; approximately one acre within the Seashore remains designated potential wilderness. Specifically, potential wilderness encompasses the areas where the boardwalk nature trail at Smith Point now stands and the adjoining Old Inlet area. The dune crossing and outhouse formerly located at Old Inlet were lost during Hurricane Sandy in October 2012 and will not be replaced. These areas now meet the standards for wilderness designation.

Fewer than 1,400 acres, the Otis Pike Fire Island High Dune Wilderness Area (Fire Island Wilderness) is one of the smallest wilderness areas managed by the NPS and is the only federally designated wilderness in New York State (Wilderness.net 2012). Any action proposed to take place within the Fire Island Wilderness, such as research or resource management, is subject to a minimum requirement analysis as described in the Minimum Requirements Decision Guide (developed by the interagency Arthur Carhart National Wilderness Training Center) and *NPS Management Policies 2006* (section 6.3.5). This concept is applied as a two-step process that determines (1) whether or not the proposed action is appropriate or necessary for administration of the area as wilderness and does not cause significant impact on wilderness resources and character, in accordance with the Wilderness Act; and (2) the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized.

The Interagency Wilderness Character Monitoring Team, which represents the Bureau of Land Management (BLM), the US Fish and Wildlife Service (USFWS), the National Park Service (NPS), U.S. Geological Survey (USGS), and U.S. Forest Service (USFS), offers an interagency strategy to monitor trends in wilderness character across the National Wilderness Preservation System in the handbook *Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System* (Landres et al. 2008). Based on the statutory language of the Wilderness Act, the interagency team identified four qualities of wilderness character that should be used in wilderness planning, stewardship, and monitoring in addition to a fifth component related to unique feature or qualities:

- Untrammeled—Wilderness is essentially unhindered and free from modern human control or manipulation
- Natural—Wilderness ecological systems are substantially free from the effects of modern civilization
- Undeveloped—Wilderness retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation
- Solitude or a primitive and unconfined type of recreation—Wilderness provides outstanding opportunities for solitude or primitive and unconfined recreation (Landres et al. 2008)
- Unique qualities of a particular wilderness area are recognized as a fifth component of wilderness character that must also be considered[11]. (www.wilderness.net)

These qualities are used in this EIS to evaluate the extent to which wilderness values are preserved, restored, or diminished under each alternative.

11 www.wilderness.net/NWPS/documents/FS/FS_Wilderness_Character_Characteristics.pdf

Regulations and guidelines related to Wilderness include:

- Wilderness Act of 1964
- National Historic Preservation Act of 1966, as amended
- Archeological and Historic Preservation Act of 1974, as amended
- Executive Order 13653: Preparing the U.S. for the Impacts of Climate Change
- Department of the Interior (DOI) Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources
- NPS Management Policies 2006
- Director's Orders 41 – "Wilderness Preservation and Management"
- Director's Orders 28 – "Cultural Resource Management Guideline."

The resource-specific context for assessing the significance of impacts on wilderness includes the following:

- The Fire Island Wilderness is a fundamental resource of Fire Island National Seashore.
- The degree to which the wilderness management complies with the provisions of Public Law 95-585, An Act to designate certain lands of the Fire Island National Seashore as the "Otis Pike Fire Island High Dune Wilderness."
- The degree to which the wilderness qualities are preserved, restored, or diminished under each alternative.
- The degree to which the unique features and qualities of the Fire Island Wilderness are acknowledged. The Fire Island Wilderness is the only federally designated wilderness area in the State of New York and occurs in the single largest metropolitan area in the United States.

WILDERNESS

IMPACTS COMMON TO ALL ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the Seashore would implement a number of activities to improve natural resource management. In particular, under Alternatives 2 and 3, the Seashore would develop a catalog of natural and cultural data and research needs and would develop a coordinated, comprehensive research and monitoring program to better understand and manage the broad range of natural resources within the Seashore boundary. Access to improved data could improve the ability of Seashore managers to maintain and/or restore ecological systems that would maintain the natural character of the Wilderness. Under all alternatives, continued management of non-native invasive species also would maintain natural character. Some natural resource monitoring and research activities may require the temporary placement of research instruments within the Wilderness area. All proposed natural resource management and research actions would be subject to the minimum requirement analysis and would be undertaken in a manner that reinforces wilderness character.

Under all alternatives, the NPS would minimize or reconfigure artificial lighting at Seashore facilities to better enable opportunities to enjoy the natural night sky. Under Alternatives 2 and 3, NPS would also undertake an evaluation of the Seashore's acoustic environment and explore opportunities to minimize the sounds associated with modern society, to the degree feasible. These proposed actions would occur on the edges of the Fire Island Wilderness and could result in maintaining or improving its natural character.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the NPS would evaluate remnant structures in the Fire Island Wilderness for eligibility for listing on the National Register of Historic Places. Any culturally significant resources that are discovered would be preserved and protected. Many of the cultural resources associated with the Fire Island Wilderness could be considered unique qualities within the context

of its wilderness character. They are a reflection of the historic uses that preceded the creation of the wilderness area and are an integral part of wilderness and can contribute to wilderness character. These proposed actions would serve to preserve some of the unique qualities of the Fire Island Wilderness.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Elements common to all alternatives related to land use and development would have no noticeable impact on the Fire Island Wilderness.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under all alternatives, the Seashore would continue to offer the opportunity for visitors to hike, collect beach plums and blueberries, hunt, and backcountry camp in the Fire Island Wilderness. Some traditional use by the federally recognized Shinnecock Indian Nation and the local, state-recognized Unkechaug tribe would continue to occur including collecting and ceremonial activities.

In addition, the Seashore would consider allowing horseback riding by permit in the Fire Island Wilderness. Although such a use has the potential to introduce nonnative invasive species (NPS 2006e), it is not anticipated that horseback riding would noticeably alter the Fire Island Wilderness ecosystem and would, therefore not detract from the natural character of the Fire Island Wilderness and would expand opportunities for unconfined recreation.

Impacts of visitor use would continue to result in foot traffic along existing pathways and dune crossings (as indicated by temporary signage) as well as through the Fire Island Wilderness independent of trails. The Seashore would continue to identify appropriate dune crossings and a through trail that in places follows the historic path of the Burma Road. The Smith Point West Nature Trail (boardwalk) would continue to be maintained, and the through trail would be minimally maintained to accommodate foot traffic. Visitor use of existing unpaved trails and/or vegetated areas outside of designated trails has the potential to reduce existing vegetation and increase the potential for erosion in those areas. Such impacts would impose a human influence on dune processes within the Fire Island Wilderness; however, such influence would be so slight that it would not noticeably detract from the untrammeled character of the Fire Island Wilderness.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Elements common to all alternatives related to transportation and access would have no noticeable impact on the Fire Island Wilderness.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

The Seashore would continue the use of temporary signage to address visitor safety and resource protection needs as necessary. Although such signage may detract slightly from the sense of solitude provided by the Fire Island Wilderness, its purpose would be to minimize or eliminate any human manipulation that could diminish the untrammeled and/or natural character of the Fire Island Wilderness. The Seashore would ensure that such signage is kept to a minimum and does not permanently impact any of the factors contributing to the wilderness character of the Fire Island Wilderness.

WILDERNESS

IMPACTS OF MANAGEMENT ALTERNATIVE 1

No Action

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts from the natural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from the cultural resource management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from the land-use and development components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from the Seashore experience component of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under this alternative, the Wilderness Visitor Center would continue to serve as the eastern gateway to the Fire Island Wilderness. The existing level of visitor use of the Fire Island Wilderness for camping would be maintained, which allows the following:

- No more than 36 people may camp in the Fire Island Wilderness zones and the Great South Beach zones combined.
- No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern zone
- No more than 24 individuals in no larger than groups of 8 per campsite in the Western zone
- Camping on the beach would be permitted annually from March 15 through Labor Day

Backcountry camping would be by permit only, and the number of permits, size and distribution of groups between the two zones would be monitored to ensure that a sense of solitude is maintained. Permit holders may elect to camp in the Wilderness or on the beach in front of the Wilderness. These limits were established in 1984 when the backcountry camping policy was developed and have seldom been met or exceeded; therefore, no additional adverse impacts would be expected beyond the minimal impacts identified in "Impacts Common to All Alternatives". Backcountry camping as currently permitted and practiced would continue to protect wilderness character and would be of long-term positive impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts from the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from the Seashore operations components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section above.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on the Fire Island Wilderness beyond what is described under this alternative.

Conclusions

Alternative 1 would have a long-term beneficial impact on the Fire Island Wilderness, because improved natural and cultural resource management would either maintain or improve the character of the Fire Island Wilderness. The Seashore would continue to post temporary signage to address resource protection and public safety needs. The introduction of temporary signage would have a short-term adverse impact on the undeveloped character of the Wilderness. On the other hand, the temporary signage could also offer a beneficial impact, in that it also protects resources and the untrammeled character of the Wilderness. In addition, under Alternative 1, the continued use of existing limits on camping within the Fire Island Wilderness and on the adjoining beach would be of long-term benefit, as it would maintain the qualities of solitude and unconfined recreation that contribute to wilderness character.

Based on this information, the largely beneficial impacts of Alternative 1 on the Fire Island Wilderness would not be considered significant. The proposed actions described above would result in no substantive changes and the conditions within the Fire Island Wilderness would continue to be consistent with applicable laws, regulations, and guidelines.

WILDERNESS

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts from natural resource management components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. Under this alternative, greater emphasis would be placed on the protection and restoration of ecological systems, patterns, and resources on federal lands. The

more aggressive approach to eradicating non-native invasive flora or restoration of natural features described under Alternative 2 could improve the untrammeled and natural character of the Fire Island Wilderness, and could result in increased beneficial impacts to the Fire Island Wilderness over current conditions.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from the cultural resource management components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from the land-use and development components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from the Seashore experience component of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under this alternative, the NPS would minimize development on the edges of the Fire Island Wilderness. The footprint of Seashore facilities at Watch Hill would be reduced, particularly, the campground would be removed from its present location. The Wilderness Visitor Center would be removed and replaced with a smaller structure. The new Wilderness visitor station would provide an outdoor orientation display and a restroom facility. These proposed actions would enhance the untrammeled and natural character and the overall sense of solitude associated with the Fire Island Wilderness and would represent a long-term beneficial impact.

Under this alternative, the existing level of visitor use of the Fire Island Wilderness for camping would be maintained, as described under Alternative 1. As noted above, these limits were established in 1984 when the primitive or wilderness camping policy was developed and have seldom been met or exceeded. Backcountry camping as currently permitted and practiced would continue to protect wilderness character and would offer a continued beneficial impact.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts from the transportation and access components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from the Seashore operations components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section above.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on the Fire Island Wilderness beyond what is described under this alternative.

Conclusions

Alternative 2 would have beneficial impacts on the Fire Island Wilderness because the Seashore would place greater emphasis on the restoration of ecological systems. The Seashore would also work to minimize development on the edges of the Fire Island Wilderness. These proposed actions would enhance the natural and untrammeled character of the Wilderness, resulting in beneficial impacts for the Fire Island Wilderness.

For these reasons, the largely beneficial impacts of Alternative 2 on the Fire Island Wilderness would be considered significant because the enhancements would go further than Alternative 1 in improving and maintaining wilderness character, and would help the NPS to more fully meet the goals and directives regarding management of wilderness.

WILDERNESS

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts from the natural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts from the cultural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts from the land use and development components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts from the Seashore experience, interpretation, education, and outreach component of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section above. In addition, under this alternative, the Wilderness Visitor Center would continue to serve as the eastern gateway to the Fire Island Wilderness. The levels of backcountry camping would be increased allowing for the following:

- No more than 72 people may camp in the Fire Island Wilderness zones and the Great South Beach zones combined. Camping on the beach is permitted annually from March 15 through Labor Day.
- In addition to those permitted to camp in the Wilderness from March 15 through Labor Day, no more than 36 people may camp on the beach.
- No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern Zone of the beach in front of the Fire Island Wilderness.
- No more than 24 individuals in no larger than groups of 8 per campsite in the Western Zone of the beach in front of the Fire Island Wilderness.
- No more than 36 people may camp in the Fire Island Wilderness zones year round.

- No more than 12 individuals in no larger than groups of 4 per campsite in the Eastern Zone of the Fire Island Wilderness.
- No more than 24 individuals in no larger than groups of 8 per campsite in the Western Zone of the Fire Island Wilderness.

The limits for backcountry camping within the Fire Island Wilderness as the same as those established in 1984 when the backcountry camping policy was established. The 1984 limits have seldom been met or exceeded. This alternative allows for up to 36 people to camp on the beach in front of the Wilderness by permit. Sufficient area exists to support this level of use without detracting from opportunities for solitude within the Fire Island Wilderness. Despite the greater number of possible permitted campers on any given night, the proposed distribution of campers and limitation on group size between the east and west zones of the Wilderness and the Great South Beach would sustain the quality of solitude and the natural and untrammeled character of the Fire Island Wilderness.

In addition, under Alternative 3, NPS would make improvements to the Wilderness Visitor Center including the installation of permanent exhibits orienting visitors to the Fire Island Wilderness. The proposed alterations to the Wilderness Visitor Center would improve the sense of entry to the Fire Island Wilderness and potentially increased visitor awareness of the wilderness values and their importance. The footprint of the building as currently experienced from the Fire Island Wilderness is unlikely to change and would not result in a change from current conditions. The long-term impact of these proposed actions is expected to be minimal.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS IMPACTS

Impacts from the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section above.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts from the Seashore operations, maintenance, and facilities components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section above.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on the Fire Island Wilderness beyond what is described under this alternative.

Conclusions

Alternative 3 would have beneficial impacts on the Fire Island Wilderness because improved natural and cultural resource management would either maintain or improve the character of the Fire Island Wilderness. In addition, under Alternative 3, the existing limits on backcountry camping would be increased allowing equal numbers to camp either in the Wilderness or on the beach. The number of people permitted to camp in the Fire Island Wilderness would not increase, the only increase would be on the beach. The distribution of campsites and limitations on group size would continue to be defined by eastern and western zones on both the beach and in the Wilderness. This would continue to limit any adverse impacts on campers by maintaining the overall sense of solitude and the natural and untrammeled character of the Wilderness. In addition, proposed new interpretive exhibits at the Wilderness Visitor Center would emphasize public awareness and appreciation of Wilderness values. Overall, the proposed actions under this alternative would be of benefit and would maintain the qualities of solitude and unconfined recreation that contribute to wilderness character.

Based on this information, the largely beneficial impacts of Alternative 3 on the Fire Island Wilderness would not be considered significant. Alternative 3 would continue to protect wilderness character and has some added benefits over Alternative 1 due to more emphasis on public education and awareness of wilderness values but does not substantially change the way the wilderness is managed and preserved.

Impacts on Transportation &Access

Methodology

Safe and efficient transportation and access in and around Fire Island National Seashore is important to an enjoyable Seashore experience, resource protection, and effective park operations. Travel to Fire Island often involves multiple forms of transportation, including some combination of private vehicle, public transportation (rail or bus transit), bicycle, private boat, or commercial ferry. The Fire Island Light Station and the Wilderness Visitor Center are both accessible by private vehicle and by bus while the Seashore's facilities at Sailors Haven, Talisman, and Watch Hill are primarily accessible by water. The vast majority of visitors to the William Floyd Estate arrive by private vehicle. On Fire Island, most people travel on foot as vehicular access is extremely limited. The Long Island roadway and transit systems are important for access to the existing ferry terminals and marinas and to the William Floyd Estate. The potential for the proposed alternatives to result in changes to transportation and access was evaluated by identifying projected increases or decreases in visitor use and the availability of the various modes of transportation, and determining whether or how these projected changes would affect overall access to and circulation within Fire Island National Seashore.

The resource-specific context for assessing the significance of impacts on transportation and access includes the following:

- The degree to which the "roadless" character of Fire Island is preserved and water-based transportation is the primary form of access to Fire Island which are among the fundamental values of the Fire Island National Seashore.
- The degree to which transportation routes to and from NPS facilities on Fire Island and Long Island are well known, well-marked, and easy and safe to navigate
- The degree to which NPS facilities are broadly accessible to all members of the public regardless of income or physical ability

TRANSPORTATION & ACCESS

IMPACTS COMMON TO ALL MANAGEMENT ALTERNATIVES

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the natural resource management components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the cultural resource management components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

No impacts associated with the land-use and development components of the Elements Common to All Alternatives were identified.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under each of the proposed alternatives, NPS would improve wayfinding to and throughout Fire Island and the William Floyd Estate including signs, maps, and other information that may be located on-line as well as at real-world locations such as regional airports, train stations, ferry terminals, Fire Island communities, and Seashore destinations. These proposed actions would enhance transportation and access to NPS sites and

facilities by providing clear directional signage and other navigation tools and would have a beneficial impact on transportation and access.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under each of the proposed alternatives, a variety of options for visitor access to Fire Island and the William Floyd Estate including bus, ferry, private boat, water taxis, and automobiles would continue to be available. Parking at Fire Island would continue to be limited to the Robert Moses State Park lot on the west side of Fire Island or the Smith Point County Park lot on the east side of Fire Island. Seashore resources near these lots are easily accessible from the parking areas; however those resources that are farther away, in the center of Fire Island, such as Talisman, Sailors Haven, and Watch Hill would only be accessible by water requiring the use of private boats, commercial ferries or water taxis. Ferry transportation to Fire Island would continue to range in cost from about $50 to $60 for a family of four including parking – cost prohibitive for some segments of the public.

Bicycle use on federal lands would continue to be limited to where and when vehicular access is permitted. There are currently no formal roads on Fire Island. Under all alternatives, the roadless character of Fire Island would be preserved and vehicular access would continue to be limited consistent with the Seashore's driving regulations. New York State does not permit the use of bicycles on the Robert Moses Causeway, though bicycle access is permitted on the William Floyd Parkway bridge. These practices contribute to protecting the roadless character of Fire Island; however, they limit the use of bicycles as an alternative form of transportation for accessing and traversing Fire Island. These practices would not have an appreciable impact on present transportation and access conditions at the Seashore.

Public boat docks would continue to be available at Sailors Haven, Talisman, and Watch Hill facilitating access by private boaters. The boat dock at Old Inlet was lost during Hurricane Sandy in October 2012 and will not be reconstructed. Though it represents a change, the loss of the dock at Old Inlet would not prohibit access by private boaters, as they would continue to be able to moor off shore. Sea-level rise and major storms would likely continue to interrupt access to Fire Island. Boat and dock facilities would need to be adapted over time in response to permit continued water-based access to Fire Island. These practices do not have an appreciable impact on present transportation and access conditions at the Seashore under normal conditions. However, water-based access would need to be regularly evaluated relative to the changing conditions presented by sea-level rise and may require mitigation.

At the William Floyd Estate, the vast majority of visitors would continue to arrive by car. Limited public transportation would continue to be available by public bus, though the closest bus stop is approximately one-half mile away from the Estate's public entrance. These practices do not have an appreciable impact on present transportation and access conditions at the Seashore.

Under all alternatives, both Fire Island and the William Floyd Estate would generally continue to be well served by the existing road and public transportation systems, though transportation costs could prove to be prohibitive for some segments of the visiting public. The effects of sea-level rise and storm events could have a long-term adverse impact on some facets of the transportation infrastructure and could result in periodic interruptions of service.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under all alternatives, the NPS would seek to improve accessibility to Seashore sites and facilities for people with disabilities. Where accessibility is not feasible, interpretive media would be employed to accommodate disabled visitors. Seashore staff would coordinate trips to Fire Island across Seashore divisions to maximize use of water-based transportation and to minimize vehicular use on Fire Island in support of Seashore goals. These practices would not have an appreciable impact on present transportation and access conditions at the Seashore.

TRANSPORTATION & ACCESS

IMPACTS OF MANAGEMENT ALTERNATIVE 1

No Action

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the natural resource management components of Alternative 1 were identified.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the cultural resource management components of Alternative 1 were identified.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

No impacts associated with the land-use and development components of Alternative 1 were identified.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with Seashore experience, interpretation, education, and outreach components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with transportation and access components of Alternative 1 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, the marinas at Sailors Haven and Watch Hill would remain open at their current capacity, supporting continued overnight access for private boaters in these locations.

At the William Floyd Estate, trails and unpaved roadways throughout the Estate would be retained and would remain unmarked. A trail map would continue to be available; however in the absence of marked trails, navigation in the Lower Acreage could be difficult for some visitors.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 1 would be the same as those described in "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact transportation and access within and near the Seashore. These actions include regular dredging of channels in Great South Bay, the 2011-2014 New York State Transportation Improvement Program (STIP), the New York Metropolitan Transportation Council 2010 – 2035 Regional Transportation Plan, the Long Island Comprehensive Regional Sustainability Plan 2035, and the Brookhaven 2030 Plan.

Routine dredging activities near Fire Island National Seashore are necessary to maintain channels within the Great South Bay to accommodate ferries and other large vessels. The Long Island Intracoastal Waterway Federal Navigation Project, which is currently being implemented by the USACE, would aid in these efforts and facilitate the use of the Great South Bay by the U.S. Coast Guard as well as a variety of recreational and commercial vessels. The project will expand (both in area and depth) the existing channels. Continued and enhanced dredging efforts within the Great South Bay will improve water access to Fire Island National Seashore by continuing to provide routes for ferries and other large vessels.

The NY Metropolitan Transportation Council, the Long Island Comprehensive Regional Sustainability Plan, and the Brookhaven 2030 Plan all express a region-wide desire to improve the transportation network and to expand the range of transportation options on Long Island. Depending on the transportation options implemented, this could enhance access to the William Floyd Estate and Fire Island. The 2011-2014 New York State Transportation Improvement Program (STIP) includes a variety of transportation projects throughout the state, several of which would have the potential to impact transportation and access related to Fire Island National Seashore. In particular, proposed improvements to infrastructure at the Ocean Beach Ferry Terminal on Fire Island and the Bay Shore ferry terminal on Long Island would enhance water access to Fire Island passenger services and freight; and the proposed

replacement of the William Floyd Parkway Bridge over Narrow Bay at Smith Point County Park would sustain public access and improve safety.

The impact of these past, present, and reasonably foreseeable future actions would be long-term beneficial. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term adverse effects of Alternative 1, would be long-term beneficial. Alternative 1 would contribute an imperceptible beneficial increment to the overall cumulative impact.

Conclusions

Overall, impacts to transportation and access as a result of implementation of Alternative 1 would generally be beneficial in effect. The natural and cultural resource management and land-use and development components of Alternative 1 would have no noticeable impacts on transportation and access. The Seashore experience, interpretation, and outreach; the transportation and the Seashore operations, maintenance and facilities elements of this alternative would result in beneficial impacts on access and transportation because accessibility of resources would be improved, especially for disabled visitors and wayfinding would largely be enhanced.

There would be no noticeable impacts on the "roadless" character of Fire Island, existing transportation routes, or universal accessibility (both physical and financial) of the Seashore. Based on this information and the character and extent of the overall transportation and access system throughout the Seashore as summarized above, the largely beneficial impacts of Alternative 1 would not be considered significant because although there would be some improvements, there would not be an overall change in the current transportation and access systems.

TRANSPORTATION & ACCESS

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under Alternative 2, greater emphasis would be placed on the protection and restoration of ecological systems, patterns, and resources on federal lands. Some of these efforts may result in restricted access to areas undergoing restoration for limited periods of time of varying length. Other areas may be made more accessible to visitors through the introduction of boardwalks, which allow for greater immersion in the natural environment while limiting resource degradation. To meet the Seashore's objectives for natural resource management under this alternative, greater emphasis would have to be placed on monitoring for carrying capacity to ensure that the level of public access does not negatively impact desired conditions. Efforts to address carrying capacity may result in periodic changes to what would be considered permissible in terms of public access. These actions would have a long-term adverse impact on transportation and access in some areas, particularly where existing visitor infrastructure is being removed or reduced to make way for natural resource restoration. However, the actions would also offer a long-term benefit in terms of creating new opportunities for access into the Seashore's natural areas through the use of boardwalks and other methods that enable access while minimizing resource degradation.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under Alternative 2, the NPS would retain and rehabilitate the cultural landscape of the William Floyd Estate. Consistent with the rehabilitation of the cultural landscape, the roads and trails associated with the Lower Acreage would be rehabilitated to support additional recreational use. This proposal would result in making these roads and trails more accessible for recreational as well as general public use and would thus have a long-term beneficial impact on transportation and access at the William Floyd Estate.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Under Alternative 2, the Seashore would develop updated master plans for Fire Island Light Station, Sailors Haven, Talisman, and Watch Hill. These master plans would include measures to address public access and site circulation. If implemented, these elements could enhance transportation and access at these locations within the Seashore and would be of long-term benefit to transportation and access at Fire Island National Seashore.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 2 would be consistent with those described in the "Impacts Common to All Alternatives" section. In addition, under Alternative 2, the scale of Seashore visitor facilities on Fire Island would be reduced over time.

The Sailors Haven marina would be removed at the end of its structural lifecycle. This would reduce the number of slips available to accommodate extended overnight stays by private boaters. Private boaters would continue to be able to moor off-shore and would have access to boat docks at Sailors Haven and Talisman for the purposes of picking up and dropping off passengers and gear. Reducing the number of available boat slips could increase congestion at the boat docks because more boats would be forced to moor offshore and drop passengers and gear off at the dock, possibly having an adverse impact on transportation and access at the Seashore's facilities.

Also under Alternative 2, the Seashore would explore the possibility of creating an off-site orientation exhibit related to the William Floyd Estate on the main thoroughfare within the village of Mastic Beach. The exhibit would provide a waypoint to visitors as they navigate their way through the village to the William Floyd Estate and would also raise awareness of the Estate within the surrounding community. This proposed action would be of benefit to transportation and access relative to the William Floyd Estate.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, the Seashore would collaborate with the Long Island Railroad (LIRR) and Suffolk County to promote the use of public transportation to get to Seashore destinations. This effort could reduce overall traffic levels and vehicle miles traveled (VMT) in the vicinity of mainland ferry terminals and could reduce the demand for parking.

Under Alternative 2, the NPS would work with others to expand opportunities for water-based facilities on Fire Island that can accommodate the movement of goods and services. This effort would make it more feasible to load and deliver freight to and from the docks, thereby reducing the need for trucks to carry materials on and off Fire Island. This would reduce vehicular use and enhance the roadless character of the island.

Under Alternative 2, the NPS would improve parking and circulation at the William Floyd Estate. The expansion and rehabilitation of the existing visitor facility and other proposed physical and programmatic changes at the William Floyd Estate would be likely to increase visitation to the Estate over the long term. Under this alternative, the existing parking lot would be reconfigured and could be expanded to accommodate the potential increase in visitors. In addition, the existing boardwalk would be realigned to provide better access between the visitor orientation facility and the Old Mastic House. Both of these enhancements would benefit transportation and access at the William Floyd Estate.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be the same as those described in "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact transportation and access within and near the Seashore. These actions include regular dredging of channels in Great South Bay, the 2011-2014 New York State Transportation Improvement Program (STIP), the New York Metropolitan Transportation Council 2010 – 2035 Regional Transportation Plan, the Long Island Comprehensive Regional Sustainability Plan 2035, and the Brookhaven 2030 Plan as described under Alternative 1. The cumulative impact of these actions would result in a long-term beneficial impact on transportation and access.

The cumulative impact of these actions, in combination with the long-term adverse effects of Alternative 2, would be long-term adverse. Alternative 2 would contribute an imperceptible adverse increment to the overall beneficial impact.

Conclusions

Overall, impacts to transportation and access associated with Alternative 2 would be beneficial and adverse.

Cultural landscape restoration efforts at the William Floyd Estate including the rehabilitation of the roads and trails of the Lower Acreage would benefit transportation and access at the Seashore by improving public access as would improvements to the parking and the circulation system. Master planning proposed for the Seashore's primary visitor facilities would also address site circulation and access making way for improvements that would have beneficial impacts on transportation and universal access. These beneficial impacts would be long-term in duration and within the context of preserving the "roadless" character of Fire Island, enhancing existing transportation routes, and improving universal accessibility (both physical and financial) of the Seashore would be considered significant.

Natural resource restoration projects could result in short-term adverse impacts to transportation and access by temporarily limiting or prohibiting public access during site restoration. The eventual removal of the marina at Sailors Haven would represent a noticeable change and would result in reduced overnight access for private boaters. Although these adverse impacts are likely to be highly visible to some user groups, they would not noticeably affect the "roadless" character of Fire Island, existing transportation routes, or universal accessibility (both physical and financial) of the Seashore and therefore would not be considered significant.

TRANSPORTATION & ACCESS

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

No impacts associated with the natural resource management components of Alternative 3 were identified.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

As under Alternative 2, under this alternative the NPS would retain and rehabilitate the cultural landscape of the William Floyd Estate. Consistent with the rehabilitation of the cultural landscape, the roads and trails associated with the Lower Acreage would be rehabilitated to support additional recreational use. This proposal would result in making these roads and trails more accessible for recreational as well as general public use.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Like Alternative 2, under this alternative the Seashore would develop updated master plans for Fire Island Light Station, Sailors Haven, Talisman, Watch Hill, and the Wilderness Visitor Center. These master plans would include measures to address public access and site circulation. If implemented, these elements could enhance transportation and access at these locations within the Seashore.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, under Alternative 3, the NPS would work with others to encourage a broad range of experiences including NPS sites and facilities, Fire Island communities, and related regional attractions (e.g., Long Island Maritime Museum, Wertheim NWR, and the Manor of St. George). The increased dispersion of visitors could reduce congestion near points of interest but may also increase visitor traffic in other locations.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, similar to Alternative 2, under this alternative the Seashore would make efforts to promote the use of public transportation, which could reduce overall traffic levels and vehicle miles traveled (VMT) in the vicinity of mainland ferry terminals and could reduce the demand for parking. As part of these efforts, the Seashore would convene an inter-community Bicycle Working Group to consider the specific benefits and impacts of expanding bicycle use as a lateral transportation option. The development of this group could result in improved transportation and access on Fire Island by further reducing reliance on motorized vehicles.

Under Alternative 3 the Seashore also would continue to maintain water access to Fire Island consistent with current conditions, as described under Alternative 1. The public docks at Watch Hill, Talisman, and Sailors Haven would be maintained, and the Sailors Haven and Watch Hill marinas would continue to operate at current capacities. As described under the other alternatives, private boats also would continue to be allowed to moor offshore, providing another option if the marinas are full. In addition, under Alternative 3 the Seashore would take steps to improve ferry service to Fire Island by expanding service during the shoulder season to specific destinations and expand lateral water taxi service.

As in Alternative 2, the NPS would improve parking and circulation at the William Floyd Estate. The expansion and rehabilitation of the existing visitor facility and other proposed physical and programmatic changes at the William Floyd Estate would be likely to increase visitation to the Estate over the long term. Under this alternative, the existing parking lot would be reconfigured and could be expanded to accommodate the potential increase in visitors. In addition, the existing boardwalk would be realigned to provide better access between the visitor orientation facility and the Old Mastic House. Both of these enhancements would benefit transportation and access at the William Floyd Estate.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would be the same as those described in "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact transportation and access within and near the Seashore. These actions include regular dredging of channels in Great South Bay, the 2011-2014 New York State Transportation Improvement Program (STIP), the New York Metropolitan Transportation Council 2010 – 2035 Regional Transportation Plan, the Long Island Comprehensive Regional Sustainability Plan 2035, and the Brookhaven 2030 Plan as described under Alternative 1. The cumulative impact of these actions would result in a long-term beneficial impact on transportation and access.

The cumulative impact of these actions, in combination with the long-term beneficial effects of Alternative 3, would be long-term beneficial. Alternative 3 would contribute an imperceptible beneficial increment to the overall beneficial impact.

Conclusions

Overall, impacts to transportation and access associated with Alternative 3 would be both adverse and beneficial. Cultural landscape restoration efforts and improvements to the parking and circulation system at the William Floyd Estate including the rehabilitation of the roads and trails of the Lower Acreage would benefit transportation and access at the Seashore by improving opportunities for public access and circulation. Master planning proposed for the Seashore's primary visitor facilities would also address site circulation and access, making way for improvements in that area and thus would have beneficial impacts.

Adverse impacts would also occur under this alternative. Actions related to seashore visitor experience could increase dispersion of visitors across Fire Island and to related regional destinations and could reduce congestion near points of interest but may also increase visitor traffic in other locations.

In summary, implementation of Alternative 3 would have both beneficial and adverse impacts on Transportation and Access at the Seashore. The beneficial impacts, when considered within the context of preserving Fire Island's "roadless" character, the provision of broad accessibility, and enhancing transportation routes to the Seashore, would be considered significant.

Implementation of Alternative 3 would also have long-term adverse impacts on transportation and access on the Seashore, however, within the context of preserving Fire Island's "roadless" character, providing for accessibility and enhancing transportation routes to the Seashore, they would not be considered significant because they would not be readily noticeable

Impacts on Visitor Use & Experience

Methodology

NPS Management Policies 2006 states that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks.

Part of the purpose of Fire Island National Seashore is to offer opportunities for the use and appreciation of the national seashore. Consequently, among the Seashore's management goals are the following:

- Through vigorous outreach and education, the Seashore will foster public understanding and appreciation of the purpose and significance of the national seashore and its natural and cultural resources, as well as the public's vital stewardship role in protecting Fire Island.
- The Seashore provides a wide variety of quality recreational and interpretive experiences for a broad range of audiences, emphasizing human interactions with the environment and the historical and cultural values of the Seashore.

Public scoping input and observation of visitation patterns combined with assessment of what is available to visitors under current management were used to estimate the impacts of the actions in the various alternatives in this document. The impact on the ability of the visitor to experience a full range of the Seashore's resources was analyzed by examining resources and objectives presented in the Seashore's foundation for planning statement and the Seashore's management goals. The potential for change in visitor use and experience proposed by the alternatives was evaluated by identifying projected increases or decreases in visitor uses and determining whether or how these projected changes would affect the desired visitor experience.

The resource-specific context for assessing the significance of impacts on visitor use and experience includes the following:

- The Seashore offers a wide range of experiences within a coastal environment to a large and diverse urban population in one of the most populous regions of the United States. Millions of people live within a day's travel to the Seashore and can experience a range of opportunities from solitude and communion with nature to more active recreation and social environments. This is a fundamental value of Fire Island National Seashore.
- The degree to which the Seashore may foster public understanding and appreciation of the purpose and significance of the national seashore and its natural and cultural resources, as well as the public's vital stewardship role in protecting Fire Island.

VISITOR USE & EXPERIENCE

IMPACTS COMMON TO ALL MANAGEMENT ALTERNATIVES

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the NPS would also undertake the restoration of the native vegetation, the bay shoreline, and other natural features that define the Sunken Forest as well as undertake efforts to improve the night sky by minimizing or reconfiguring artificial lighting at Seashore facilities. Under alternatives 2 and 3, the NPS would encourage and promote greater scholarly and scientific research, expand opportunities for public involvement in research and scholarship, model best practices in a number of areas to foster greater stewardship of Fire Island's resources, and place greater emphasis on evaluating, interpreting, and protecting its marine resources. All of these actions offer opportunities to enhance the visitor experience and provide new opportunities for visitor engagement

through interpretation and programmatic activities resulting in long-term beneficial impacts on visitor use and experience.

Fire Island's natural environment is the primary draw for both visitors and residents who come to experience this fragile barrier beach environment[12]. The common actions proposed here emphasize the long term protection of these resources, which would be likely to maintain current levels of visitation rather than result in any major impact to them. Likewise, current efforts to manage visitation through the use of boardwalks, requiring permits for certain activities, and other methods would be likely to minimize any issues related to carrying capacity. In the final analysis, these proposed actions are unlikely to have a substantial impact on the current level of Seashore visitation or carrying capacity.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Similar to what is described under natural resources under Alternatives 2 and 3, the NPS would encourage greater scientific and scholarly research and expand opportunities for public involvement in the research and stewardship of the Seashore's cultural resources on Fire Island and at the William Floyd Estate. The NPS would continue to preserve cultural resources on federal lands and actively interpret those associated with the William Floyd Estate and the Fire Island Light Station. All of these actions would offer opportunities to enhance the visitor experience and provide new opportunities for visitor engagement through interpretation and programmatic activities resulting in long-term beneficial impacts on visitor experience. These proposed actions are unlikely to have a noticeable impact on the current level of visitation or carrying capacity at the Seashore's cultural sites.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Elements common to all alternatives related to land use and development would have no noticeable impact on visitor use and experience.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under all alternatives the NPS would continue to seek to broaden the diversity and geographic scope of its visitation. It would increase educational outreach, particularly through the use of new and developing technologies and social media. The NPS would commit to being a role model for sustainability and would consider its general practices and specific actions as opportunities to educate the public. The NPS would collaborate with others to improve directional signage to ferry terminals and park facilities on Long Island and would provide more opportunities to orient the visitor to Fire Island. Visitor research would be undertaken at regular intervals and in partnership with Fire Island communities and adjoining recreation areas. The impact of these actions on visitor numbers and composition would vary by alternative and, in some cases, would depend on how aggressively the actions were undertaken.

The common actions associated with educational outreach and on-site programming, directional signage, and park orientation would likely have a long-term beneficial effect on the composition of park visitation to Fire Island by attracting a wider audience to the Seashore, though they would be unlikely to result in a noticeable change in total visitation numbers.

At the William Floyd Estate, the NPS would work to make the Estate an educational destination for a diversity of audiences and would expand programs and events using a variety of methods and media. The NPS would engage in an outreach initiative to elevate the profile of the Estate locally, regionally, and nationally and would develop connections to related local, regional, and national sites (e.g., the Manor of St. George, Suffolk County Historical Society, and the homes of other Signers of the Declaration of Independence, etc.). As noted above, the effects of these actions proposed for the William Floyd Estate would vary in response to how aggressively they are undertaken. These actions would likely have a long-term beneficial impact on both the composition of visitation and the total visitation to the site. The NPS already has visitor management strategies (e.g., limiting the number and size of tours of the Old Mastic home) in place that enable it to adequately address carrying capacity issues at the Estate as they occur. If the frequency of carrying capacity issues were to increase, other techniques for managing visitor access to the property would need to considered and employed.

12 Forty percent of visitors surveyed in the Seashore's 2008 Visitor Use Survey indicated that their primary reason for coming to Fire Island National Seashore was the beach and over 75% indicated that they had participated in beach activities on this or a previous visit to Fire Island. (National Park Service, 2008f)

All of these proposed actions would maintain or expand upon existing visitor opportunities and would serve to further enhance interpretive and educational programming by expanding and improving program content and taking advantage of alternative methods to deliver content. They would be of long-term benefit to the visitor experience at Fire Island National Seashore.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Public transportation access to Fire Island would continue through the existing network of public transit, bus, and ferry service. Access to Fire Island by private vehicle would continue to be limited, and the NPS would continue to work with others to maintain the roadless character of Fire Island and keep driving on the island to a minimum. Parking at Robert Moses State Park on the west side of Fire Island and Smith Point County Park on the east side would continue to be available to visitors arriving by private vehicle, enabling pedestrian access to Fire Island Lighthouse and the Fire Island Wilderness and Wilderness Visitor Center. Bicycles would continue to be allowed only on federal tracts where and when vehicles are permitted but there would be no Fire Island-wide recreational bicycle trail. These continuing actions do not represent a change in the status quo.

During the scoping phase of the planning process, concerns were raised about ferry and water taxi fares, indicating that they may be cost prohibitive for some segments of the population – particularly lower-income families and local school districts. The high cost of water taxi service contributes to the difficulty of experiencing Fire Island as a whole, and may influence the composition of the Seashore's audience. In recent years, ferry service providers have put larger ferries into service. While the larger ferries have enabled more visitor access, under some circumstances they are also generating some carrying capacity concerns, as visitors overwhelm some parts of Fire Island. This has reportedly been a concern in some of the Fire Island communities, though it has not been reported at Seashore facilities.

The vast majority of visitors to the William Floyd Estate would continue to arrive by private vehicle. A public bus stop is located within one-half mile of the main visitor entrance to the property; however, it does not appear to be a popular option. Under all alternatives, NPS would work in collaboration with the local community to ensure that directional signage guiding visitors to and from the William Floyd Estate is installed. Other media and technologies would also be considered to improve the ease and safety of navigating to and from the Estate. Improving the travel experience to and from the Floyd Estate could have a positive effect on visitation there – particularly by encouraging repeat visitation. While visitation numbers could rise as a result of the proposed transportation and access improvements, the net impact is likely to be a minor increase in visitation.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

In all alternatives, the NPS would ensure that structures, grounds, and facilities on Fire Island and at the William Floyd Estate are made universally accessible to the greatest degree feasible. In the event that creating universal access is infeasible, other means (e.g., the use of interpretive media) would be used to accommodate visitors with disabilities. This would enable disabled visitors to have greater access to Seashore resources. Greater universal access is likely to have a minimal, though beneficial, impact on visitor numbers and composition. Carrying capacity would not be affected by this proposal. Greater universal access would expand visitor opportunities and improve access to interpretive and educational programming.

VISITOR USE & EXPERIENCE

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 1 would be similar to those described in the "Impacts Common to All Alternatives" section. Also under this alternative, Suffolk County Vector Control would continue to manage mosquitoes within Smith Point County Park, in private communities located within the boundaries of Fire Island, and areas adjoining but not in the William Floyd Estate on Long Island. Mosquito management on federal lands within the Seashore would emphasize public health and safety over human comfort. Some areas of the Seashore would continue to experience uncomfortable volumes of

mosquitoes during some times of the year, which would continue to influence visitation patterns to those areas.

Recreational fishing and shell fishing would continue to be permitted consistent with state and local regulations, while the federal policy prohibiting commercial fishing and shell fishing would continue. Continuing these current management practices is unlikely to result in any noticeable impacts on visitation, visitor opportunities, or interpretive and educational programming at Fire Island National Seashore, nor would they result in any impacts related to carrying capacity.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 1 would be similar to those described in the "Impacts Common to All Alternatives" section. The effort to rehabilitate the Carrington Estate house and cottage would not influence visitation in that area, as the property would not be open to the public. Under this alternative, cultural resource management actions would have no noticeable impact on visitation, visitor opportunities, or interpretive and educational programming at Fire Island National Seashore, nor would they present any impacts related to carrying capacity.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

No impacts associated with the land-use and development components of Alternative 1 were identified.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach component of Alternative 1 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, on Fire Island the visitor experience would remain somewhat segmented, with visitors to Seashore facilities largely staying within those facilities and visitors to and local residents of Fire Island communities largely staying within their individual communities. Visitor facilities and the types of recreational activity would remain unchanged. The actions proposed under this alternative would not appreciably change the visitor experience and would result in negligible to no impact on the composition or total numbers associated with park visitation.

At the William Floyd Estate, the visitor experience would continue to be centered on the Old Mastic House tour, which would be available seasonally. Thematically relevant programs and nature walks would continue to be offered year-round as staffing and conditions permit. The lack of an indoor orientation space would continue to discourage visitation by school groups that have harbored concerns about exposure to Lyme Disease and other vector-borne illnesses due to the large population of deer and Lone Star ticks often present at the Estate. The actions proposed under this alternative would result in no noticeable impacts on visitation, visitor opportunities, or interpretive and educational programming at the Estate.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact visitor use within the Seashore. These actions and initiatives include: the Long Island Regional Comprehensive Sustainability Plan 2035; the Long Island South Shore Estuary Reserve Comprehensive Management Plan; the Great South Bay Hard Clam Restoration Project; and the Brookhaven 2030 plan.

In the Long Island Regional Comprehensive Sustainability Plan 2035 prepared by the Long Island Regional Planning Council, one primary area of emphasis is the protection and enhancement of the quality of life on Long Island. Efforts to retain or expand upon open space, public parks and beaches, and local agriculture are highlighted as high-priority initiatives. In addition, addressing water quality, improving transportation systems, and reducing the region's environmental footprint are also important emphases. As a major public park with diverse recreational offerings, Fire Island National Seashore would clearly contribute

to maintaining the region's quality of life. Likewise, other facets of the Long Island sustainability plan (e.g., improving water quality, regional transportation systems, and reducing the region's environmental footprint) would contribute positively to the Seashore's management goals and objectives pertaining to visitor use and experience. The early scoping documents associated with the Brookhaven 2030 plan identify priorities that are similar to the Long Island Sustainability Plan, though it particularly highlights improving the William Floyd Parkway as a gateway to Fire Island National Seashore. It would also contribute positively to visitor use and experience at the Seashore.

With its emphasis on improvements to water quality, expansion of public use and enjoyment of the South Shore Estuary Reserve (SSER), and increasing education, outreach, and stewardship, the Long Island South Shore Estuary Reserve Comprehensive Management Plan offers an agenda that supports the protection and use of the Great South Bay, a shared resource. As such, the SSER plan would also contribute positively to the Seashore's management goals and objectives pertaining to visitor use and experience.

The Great South Bay Hard Clam Restoration Working Group was convened by the Suffolk County Executive in 2008 and was tasked with: (1) Ensuring adequate enforcement of hard clam harvest laws, regulations, and codes in Great South Bay; (2) Establishing interim hard clam harvest management recommendations for the Great South Bay; and (3) Developing a long-term, science-based, sustainable management plan for the hard clam population of Great South Bay. The resulting Great South Bay Hard Clam Restoration Project calls for a multi-pronged approach to harvest management and efforts to address the environmental factors (e.g., water quality) that are negatively impacting hard clam growth and survival. Shellfishing could be limited in some areas of Great South Bay (including areas within the Seashore boundary) for the duration of the Hard Clam Restoration Project which would result in a long-term adverse impact to this type of visitor use. However, failing to constrain this type of use over the period necessary to restore sustainable populations of hard clams to the bay could result in the permanent loss of this visitor use opportunity.

These past, present, and reasonably foreseeable future actions would result in a net long-term benefit to visitor use related to Fire Island National Seashore. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term minor and adverse effects of Alternative 1, would be long-term beneficial. Alternative 1 would contribute an imperceptible long-term minor adverse increment to the overall beneficial impact.

Conclusions

Overall, impacts to visitor use associated with Alternative 1 would result in both beneficial and adverse impacts. Scientific and scholarly research initiatives related to natural and cultural resource management would be of significant benefit to visitor use through better informing resource management and interpretation. Mosquito management would continue to focus exclusively on human health and safety rather than human comfort which would result in short term, adverse impacts to visitor use in some areas of the Seashore during certain times of year. The continuing lack of an indoor program space at the William Floyd Estate would result in adverse impacts to visitation due to continued concerns about exposure to ticks.

The cumulative impact would be long-term beneficial, and Alternative 1 would contribute an imperceptible long term minor adverse increment to the overall beneficial cumulative impact.

Based on this information, the largely beneficial impacts of Alternative 1 on visitor use and experience would not be considered significant in the context of providing a wide range of experiences to a large, diverse, urban population and fostering public understanding and appreciation of Fire Island. The impacts of some proposed actions that are considered Common to All Alternatives would be readily detectable and beneficial but most actions would not result in noticeable impacts. In general, the adverse impacts on visitor use and experience would not be considered significant. Visitor use and experience would be minimally affected under this alternative. However, conditions at the William Floyd Estate that have influenced visitation as described above have resulted in impacts to visitor use and experience that could be considered significant particularly in the context of fostering public understanding and appreciation of the Seashore.

VISITOR USE & EXPERIENCE

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, greater emphasis would be placed on the protection and restoration of natural ecological systems, patterns, and resources.

The NPS would employ public education and outreach as a tool to foster stewardship of Fire Island's resources and would provide educational programs, demonstration projects, and other efforts to engage visitors and residents. Efforts to restore native plant species would extend beyond federal lands through collaborative projects and technical assistance to Fire Island communities, state and county parks, and others. More intensive resource management activities on Fire Island may result in restrictions on visitor use in some areas. On the other hand, expansion of educational opportunities to engage in scientific research and monitoring may enable visitor access in areas that were previously inaccessible or largely unvisited.

Under this alternative, natural resource management actions may result in altering patterns of visitation but are not likely to impact overall visitor use or visitor numbers. The natural resource actions proposed in this alternative, in concert with related actions associated with visitor facilities, could have a noticeable impact on visitation. In areas identified to be restored to their natural state, the carrying capacity of that area would change, and the way in which visitors access and experience them would need to be modified in response. The overall visitor experience at Fire Island National Seashore sites and facilities would be noticeably changed, with greater opportunities for interaction with the natural environment.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. As in Alternative 1, cultural resource actions would largely emphasize the preservation and interpretation of cultural resources on federal lands, particularly the William Floyd Estate and the Fire Island Light Station. Under this alternative curatorial storage would be reorganized to allow for a greater efficiency. The reorganization of the curatorial storage facility is expected to make the Seashore's museum and archival collection more easily accessible, but it is not expected to result in more than a minor increase in public and scholarly use of the collection. Conditions for the periodic tours of the curatorial storage facility would be improved as a result of these actions and thus improve this facet of the visitor experience.

Under Alternative 2, at the William Floyd Estate the interiors of the Old Mastic House would be reorganized, resulting in the removal of the exhibit area and the sales space from the historic structure and refurnishing those spaces for use in the interpretation of the home. Missing historic features would be marked and interpreted to help visitors better understand the history of the Estate. The Lower Acreage would be rehabilitated, and portions of the landscape would be restored as "landscape vignettes" to allow for the interpretation of different periods in the Estate's history (e.g., planting a single cultivated field, recreating a garden).

As these changes occur, they are likely to inspire a spike in visitation at the Estate as visitors come to experience a particular new feature. This would likely be a short-term benefit to the Estate's visitation that would expose more people to the site and possibly broaden its visitation over the long term. The Seashore has visitor management strategies (e.g., limiting the number and size of tours of the Old Mastic home) in place that enable it to adequately address carrying capacity issues at the Estate as they occur. If the frequency of carrying capacity issues were to increase, other techniques for managing visitor access to the property would need to be considered and employed.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, visitors would continue to enjoy access to and interpretation of cultural resources at the William Floyd Estate and the Fire Island Light Station, while the visitor experience in other areas of the Seashore would center on close contact with and immersion in the natural landscape. Clearly organized access routes would minimize the disturbance of natural resources, with access to some areas restricted and some different types of uses that are "lighter on the land" encouraged. Physical connections between Seashore sites and the Fire Island communities would continue to be limited or even diminished. These proposed actions would have a long-term impact on the visitor experience that may be perceived by some as beneficial and by others as adverse.

Orientation to Fire Island would occur using outdoor interpretive panels at the ferry terminals on Long Island and at gateway kiosks located near Robert Moses State Park on the west side and Smith Point County Park on the east side. Information on Fire Island would also be available on line and via applications (apps) for other digital media. Over time a number of visitor facilities would be removed or reduced in size, allowing their locations to be restored or to revert to a natural state. These facilities include the Sailors Haven Marina, the restrooms and beach walk on the west end of Talisman, and the Wilderness Visitor Center. These proposed actions could result in a modest decrease in visitation as the composition and diversity of facilities and related services at each affected location is altered. Private boaters would be among the most affected by the proposed changes, as the number of available boat slips would be greatly reduced. Private boats would still be permitted to moor off-shore, but the overall visitor experience would represent a noticeable departure from current conditions.

Life-guarded beaches remain at Sailors Haven and Watch Hill, though there would no longer be lifeguards posted at Talisman. A water trail would be established on the bay side of Fire Island that would offer a guide or brochure, and occasional guided experiences offered by Seashore staff. Guided canoe trips would continue to be offered from Watch Hill. As in Alternative 1, beach camping in front of the Fire Island Wilderness would be permitted so that individuals seeking a camping permit for the Wilderness could choose to camp overnight on the beach or within the Wilderness Area. The number of permits and the size of the groups would be consistent with current practices and would not have an impact on the visitor experience.

The gradual removal or reduction of facilities and rehabilitation of natural areas on Fire Island is likely to have a long-term impact on park visitation in terms of visitor numbers, which are likely to decline moderately in response to more limited facilities. The composition of visitor audience may also potentially become more homogenous, although educational outreach to different audiences, particularly underserved communities, could have a mitigating effect, potentially making the composition of the visitor audience more diverse. As the nature of the visitor experience changes, visitor access would have to be managed to protect the rehabilitated natural landscape, which could require the establishment of new standards and monitoring protocols to address carrying capacity. The proposed removal or reduction of facilities would change how visitors experience Fire Island National Seashore and could present new opportunities for interpretive, educational, and recreational engagement.

The elimination of the already-limited lifeguard protection at Talisman is likely to have negligible to no impact on visitation numbers or the composition of the visitor audience. Private boaters would continue to be the principal users of this facility, as there is presently limited public ferry service to this location. Carrying capacity is unlikely to be a major issue in terms of resource degradation, although heavy weekend visitation can mar the experience of those who come to Talisman expecting a more isolated experience. The introduction of a water trail offering both self-guided and guided experiences could attract different types of visitors and thereby have a minor impact on the composition of visitors, but it is likely to have negligible or no impact on visitor numbers. The relocation of the Seashore's campground to a location with reduced mosquito exposure may result

in an increased demand for campsites. Finally, allowing Wilderness permittees the choice of sleeping on the beach versus in the Wilderness would not increase the numbers of people or sizes of groups presently having access to the Fire Island Wilderness area; therefore there is no anticipated impact on visitation to the beach in front of the Wilderness or to the Fire Island Wilderness. Likewise, concerns about carrying capacity in this context are expected to be negligible.

At the William Floyd Estate, the NPS would build upon existing visitor infrastructure including restrooms and an orientation kiosk to develop an indoor flexible program space and an adjoining, covered outdoor space. The NPS would work in collaboration with the village of Mastic Beach to install an orientation exhibit at an off-site, village-based location. The introduction of "landscape vignettes" – restoring segments of the landscape (e.g., a cultivated field) to help visitors understand the historic uses of the property – could occur in the Lower Acreage as well as in the historic core. Interpretive programming would emphasize regional and community connections to the Estate, and a strong emphasis would be placed on working with area school districts to tie on-site school programs to the state curriculum.

Interpretive tours of Old Mastic would be scheduled and ticketed to manage the volume and flow of visitors through the house. Visitors would also have the opportunity to explore other structures and features within the historic core, see an exhibit at the expanded curatorial facility, and walk along the historic system of roads and trails to learn about the Estate's grounds.

These proposals for the William Floyd Estate, particularly developing indoor/ outdoor program space that separates visitors from the more tick-populated area of the open lawn and offering more opportunities for evening and year-round programming, would likely have a long-term beneficial impact on the number of visitors touring the site and participating in programs. There would likely also be a long-term benefit in the composition of visitors through encouraging the return of local school districts to the Estate and potentially attracting more local and repeat visitation to the site.

The introduction of an orientation exhibit in the Village of Mastic Beach could serve as an important way point, enabling visitors to better make their way along densely developed neighborhood streets to the Estate. The placement of the orientation exhibit within the village may also make local residents more aware of the presence of the Estate in their own community. The off-site orientation exhibit is likely to have a beneficial impact, though the improved signage proposed under Transportation and Access is likely to have the greater impact in directing visitors to the Estate.

The introduction of new interpretive elements, like the landscape vignettes, and interpretation of other missing historic features (as described under the impacts of cultural resources actions) would be likely to inspire a spike in visitation at the Estate as visitors come to experience a particular new feature. This would likely be of short-term benefit to the Estate's visitation but would expose more people to the site and possibly broaden its visitation over the long term. The Seashore has visitor management strategies (e.g., limiting the number and size of tours of the Old Mastic home) in place that enable it to adequately address carrying capacity issues at the Estate as they occur. If the frequency of carrying capacity issues were to increase, other techniques for managing visitor access to the property would need to considered and employed.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. Also under this alternative, the NPS would collaborate with the Long Island Railroad, Suffolk County Transit, and the ferry companies to aggressively promote the use of public transportation to access Fire Island and the William Floyd Estate.

As noted above, under this alternative the NPS would reduce the number of overnight boat slips that would be available for the use of private boaters as there would no longer be boat slips available at Sailors Haven. Private boaters would continue to be able to drop off passengers and gear at the dock and anchor offshore.

Efforts to promote the use of public transportation would not be likely to impact visitation directly but may increase public awareness of Fire Island National Seashore which would in turn have an impact on park visitation. As public transportation campaigns occur, Fire Island National Seashore is likely to see a short-term uptick in visitation numbers and possibly visitation composition. However, this is not likely to be sustained over the long term.

Based on the Seashore's 2008 visitor survey, 27 percent of the park's visitors arrived by private boat. Reducing the number of boat slips on Fire Island is likely to have a long-term adverse impact on visitation by private boaters and overall park visitation. The number of private boats anchoring off shore would likely increase well beyond the large numbers of boaters who currently do so on busy summer weekends. This could present a carrying capacity issue in terms of resource protection (e.g., more anchors, resulting in damage to marine resources), visitor experience (crowding), and visitor safety. The NPS would explore the creation of a formal mooring system to mitigate these issues.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, an increase in staffing is proposed to address the demands presented in the implementation of this alternative including increased focus on research, monitoring, resource protection, and education related to natural resources.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact visitor use within the Seashore. These actions and initiatives include: the Long Island Regional Comprehensive Sustainability Plan 2035; the Long Island South Shore Estuary Reserve Comprehensive Management Plan; the Great South Bay Hard Clam Restoration Project; and the Brookhaven 2030 plan as described under Alternative 1.

These actions would result in a net long-term benefit to visitor use related to Fire Island National Seashore. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term moderate and adverse effects of Alternative 2, would be long-term beneficial. Alternative 2 would contribute a long-term minor adverse and beneficial increments to the overall beneficial impact.

Conclusions

Overall, impacts to visitor use associated with Alternative 2 would result in both beneficial and adverse impacts. Proposed removal of visitor facilities and restoration of natural areas could be of long-term benefit to the visitor experience, although these proposed changes may also be viewed as adversely impacting the experience of some segments of the visiting public. Under this alternative, the way that visitors experience many of the Seashore's sites and facilities on Fire Island would change and could be viewed positively by some and negatively by others. Improvements to museum storage and rehabilitation and expansion of visitor facilities at the William Floyd Estate would be of long-term benefit to visitor use and experience.

The cumulative impact would be long-term beneficial, and Alternative 2 would contribute a long-term adverse and beneficial increments to the overall beneficial cumulative impact.

Based on this information, the beneficial and adverse impacts of Alternative 2 on visitor use and experience would be considered significant. Many of the proposed actions described above would result in readily detectable and substantive impacts. The changes proposed would be readily perceived by the public and would have an influence on how they experience the Seashore. They would in some ways alter the wide range of experiences available to the public and would have a significant impact on how the public understands and appreciates Fire Island. Visitor use and experience would be largely beneficially affected under this alternative.

VISITOR USE & EXPERIENCE

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship Between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. As in Alternative 2, public education and engaging the public in resource management activities would be employed to foster stewardship of Fire Island's natural resources and to encourage best practices among Island residents and visitors. Under this alternative, tick and mosquito management protocols would be revised to enable the Seashore to implement a proactive management strategy in areas of high use and high risk of exposure to reduce the human health risk. The natural resource actions proposed under this alternative would have negligible or no impact on visitor use and experience.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, the Seashore's primary management emphasis would remain on cultural resources associated with federal lands. However, greater emphasis is placed on cultural resources on federal lands within the Seashore – not just Fire Island Light Station and the William Floyd Estate.

This alternative also calls for collaborating with the NYSHPO and providing technical assistance to Fire Island communities to identify, interpret, and protect cultural resources on non-federal lands across the island. Greater knowledge and recognition of cultural resources and their interpretation Fire Island-wide could result in increased "heritage tourism" visitation to Fire Island communities and a greater dispersal of visitors across multiple destinations on the island. Though it presents a new programming opportunity, it is likely to attract a fairly narrow, niche audience and should not result in any issues associated with carrying capacity.

As noted above, the Fire Island Light Station and the William Floyd Estate have protocols in place for managing visitors to their historic buildings. In Fire Island communities, particularly those with high day-use visitation, a higher profile for their heritage resources could have a long-term impact on their visitation in terms of either numbers or composition. For some of these communities, carrying capacity has been identified as a particular issue. If these changes result in an expansion of visitor numbers to these communities, an already challenging carrying capacity situation could be exacerbated. If changes result not in an expansion of visitor numbers, but in changes to the composition of their visitation, then there would likely be little impact on carrying capacity. Carrying capacity in the private communities is beyond the scope of the Seashore's management responsibilities and authorities and would be addressed by the communities themselves.

Alternative 3 also calls for the expansion and reorganization of the curatorial storage building to provide greater workspace for researchers and enabling more opportunities for the public to view the collections. This would make the collection more accessible to the scholarly community and the public. Scholars and other members of the public seeking access to the Seashore's collections represent a very small percentage of the Seashore's visitation. With greater accessibility, the number of people seeking access to the Seashore's collection would likely grow. This action would have a long-term beneficial impact on Seashore visitor use and experience. NPS museum and archival management protocols for access to and use of the collection would continue to be employed and would keep any issues related to carrying capacity at a negligible level.

The analysis for the impacts of the cultural resources components for the William Floyd Estate under this alternative would be the same as those described under Alternative 2.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, NPS would offer technical assistance and other support to encourage the identification and preservation of the distinctive character of Fire Island's communities. This could result in an enhanced visitor experience and more educational and interpretive opportunities for Seashore visitors. Though it presents a new programming opportunity, it is likely to attract a fairly narrow, niche audience and should not result in any issues associated with carrying capacity.

The analysis for the impacts of the land-use and development components for the William Floyd Estate under this alternative would be the same as those described under Alternative 2.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, the visitor experience would draw on regional connections to encourage visitors to seek out related resources on Long Island to enhance their understanding of Fire Island National Seashore (e.g., Wertheim National Wildlife Refuge, Long Island Maritime Museum, the Manor of Saint George, etc.).

Interpretation would explore the historical relationship of human settlement to the natural systems of Fire Island, Great South Bay, and the south shore of Long Island. The natural ecologies here have been influenced, manipulated, and changed by humans over the course of time and have likewise influenced human adaptation to this landscape. This is a relationship that will continue into the future. Seashore development, management activities, and practices would serve as educational opportunities to explore the principles of sustainability and good stewardship in a fragile, dynamic coastal environment.

Under this alternative, the major visitor service areas within the Seashore would be retained and programming opportunities would be expanded. For example, the deck at the Patchogue Ferry Transportation Center would become the venue for dockside visitor programming during the shoulder seasons; indoor and outdoor exhibits at Fire Island Light Station would be augmented to interpret the cultural landscape; and a sheltered group program area would be developed at Sailors Haven. The NPS would also work collaboratively with one or more partners to develop a residential environmental education program—a small-scale, formal program that is a destination for day-use and overnight participants of all ages and backgrounds to learn about the ecology of Fire Island. As under Alternative 2, the NPS would undertake the development of a canoe/ kayak water route that would offer a water trail guide or brochure and occasional guided experiences.

Under this alternative, the number of people permitted to camp in either the Wilderness Area or the beach would increase. No more than 72 people may camp in the Fire Island Wilderness zones and the Great South Beach zones combined. As is currently the case, no more than 36 people would be permitted to camp in the Fire Island Wilderness and group size and distribution would be dictated by zone. Up to 36 people would be permitted to camp on the beach with constraints on season, group size, and distribution by zone.

The activities proposed under this alternative that involve public outreach, collaborative programming, improvements to interpretive exhibits, and the development of new facilities that expand programming options at Seashore facilities would be likely to increase visitation numbers, broaden the visitor audience, and expand interpretive, educational, and recreational opportunities for visitors. These represent long-term beneficial impacts to visitation, visitor audience, and visitor opportunities at NPS facilities. Shorter-term benefits would likely occur at related sites on Long Island or in the Fire Island communities when occasional special events, exhibits, or programs take place. In general, NPS facilities can accommodate large volumes of visitation. However, at some related sites and in some Fire Island communities, increased visitation resulting from a special event, exhibit, or program may require that steps be taken to address carrying capacity to minimize resource degradation and ensure a high-quality visitor experience.

Permitting no more than 72 people to camp in the Fire Island Wilderness zones and on Great South Beach combined doubles the number of people who have traditionally been permitted to engage in backcountry camping in or in proximity to the Wilderness. Making more camping permits available in the Wilderness and on the beach may increase backcountry visitation. Sufficient area exists to support this level of use without detracting from opportunities for solitude within the Fire Island Wilderness. Despite the greater number of possible permitted campers on any given night, the proposed distribution of campers and limitation on group size between the east and west zones of the Wilderness and the Great South Beach would sustain Wilderness character.

The analysis for the impacts of Seashore experience, interpretation, education, and outreach components to visitor use and experience for the William Floyd Estate under this alternative are the same as those described under Alternative 2.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. As in Alternative 2, the NPS would work with others to improve bus and non-motorized connections to Fire Island and enhance visitor awareness of train and bus connections. The NPS would also convene an inter-community Bicycle Working Group to consider the specific benefits and impacts of increasing the use of bicycles as a lateral transportation option, particularly during the shoulder seasons. The Working Group would produce recommendations on how to best accommodate cycling and what level of bicycling would be feasible on Fire Island.

The NPS would work with the ferry companies currently servicing the Seashore and others to improve ferry service to NPS sites by expanding service during shoulder season to specific destinations. The Seashore would work with ferry operators and others to explore the possibility of providing a subsidy to reduce fares or offering a waiver – particularly for underserved schools or low-income families. The NPS would work with the ferry companies and other stakeholders to explore ways to expand lateral water taxi service and try to make it more affordable.

As in Alternative 2, efforts to promote the use of public transportation would not be likely to impact visitation directly but may increase public awareness of Fire Island National Seashore, which would in turn have an impact on Seashore visitation. As public transportation campaigns occur, Fire Island National Seashore is likely to see a short-term benefit relative to its visitation numbers and the possibly its visitation composition. However, this is not likely to be sustained. Efforts oriented toward considering expanded bicycle use during the shoulder seasons would be geared more toward their practical use as a form of transportation for Fire Island workers rather than their recreational use and would not be expected to impact visitation. Making water-based access more affordable for local school districts and low-income families would be of long-term benefit to visitor experience and use at the Seashore, as it could increase visitation to some Fire Island facilities – particularly Sailors Haven and Watch Hill-- and enable the Seashore to broaden its visitation.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. Similar to Alternative 2, a modest increase in staffing is proposed to augment educational outreach and the coordination of an expanded volunteer program. Staffing related to educational outreach and the expansion of the volunteer program would be of long-term benefit to the Seashore in its efforts to diversify visitation, improve visitor opportunities and foster stewardship.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact visitor use and experience within the Seashore. These actions and initiatives include the Long Island Regional Comprehensive Sustainability Plan 2035, the Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Great South Bay Hard Clam Restoration Project, and the Brookhaven 2030 plan as described under Alternative 1.

These actions would result in a net long-term benefit to visitor use and experience related to Fire Island National Seashore. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term minor and adverse effects of Alternative 3, would be long-term and beneficial. Alternative 3 would contribute long-term minor adverse and beneficial increments to the overall beneficial impact.

Conclusions

Overall, impacts to visitor use associated with Alternative 3 would result in both beneficial and adverse impacts. Cultural resource management actions could result in greater knowledge and recognition of cultural resources and their interpretation Fire Island-wide and increased "heritage tourism" visitation to Fire Island communities. This could also result in a greater dispersal of visitors across multiple destinations on the island. Expanding and reorganizing the curatorial storage building could be of significant benefit, as it would enable more opportunities for the public to view the collections. This would make the collection more accessible to the scholarly community and the public.

The activities proposed under this alternative that involve public outreach, collaborative programming, improvements to interpretive exhibits, and the development of new facilities that expand programming options at Seashore facilities, would be of benefit in terms of visitation numbers, a broader visitor audience, and expanded interpretive, educational, and recreational opportunities for visitors. Because of the potential network that may emerge through collaborative programming, the impacts of these proposals may actually be more regional in scope. Under Alternative 3, the existing limits on backcountry camping would be increased allowing equal numbers to camp either in the Wilderness or on the beach. The number of people permitted to camp in the Fire Island Wilderness would not increase, the only increase would be on the beach. The distribution of campsites and limitations on group size would continue to be defined by eastern and western zones on both the beach and in the Wilderness. This would have no to negligible adverse impact on the Wilderness character.

The proposed actions related to the William Floyd Estate under this alternative are the same as those described under Alternative 2. These actions would largely be of long-term benefit to visitor use and experience at the William Floyd Estate.

The cumulative impact would be long-term beneficial, and Alternative 3 would contribute short-term minor adverse and beneficial increments to the overall beneficial cumulative impact.

Based on this information, the beneficial impacts of Alternative 3 on the visitor use and experience would be considered significant in the context of providing a wide range of experiences to a large, diverse, urban population and in fostering an understanding and appreciation of Fire Island in the visiting public. Many of the proposed actions described above would result in readily detectable and substantive impacts. Visitor use and experience would be largely beneficially affected under this alternative. The adverse impacts of Alternative 3 would be negligible and would not be considered significant relative to providing a wide range of experiences or fostering understanding and appreciation of Fire Island in the visiting public.

Impacts on Socioeconomic Environment

Methodology

Fire Island and Suffolk and Nassau counties serve as the affected area for socioeconomic analysis. The Seashore and its many natural, cultural, and recreational resources and visitor opportunities are an important contributor to the regional tourism industry and an integral part of the local socioeconomic environment. Visitors to the Seashore actually reside in or must travel through these areas to visit the park. The overwhelming majority of the direct and induced socioeconomic impacts due to the proposed alternatives are expected to occur within this region.

Socioeconomic impacts were determined based on literature review, analysis of available data, applied logic, and professional expertise and judgment. The factors considered to identify and assess potential socioeconomic impacts include economic data, historic visitor use data, the effects of the alternatives on expected future visitor use and visitor experience, and proposed future development and management within the Seashore. Consideration is also given to the potential effects of the proposed actions on community character and on land use and development. A mostly qualitative analysis is sufficient to compare the effects of alternatives for decision-making purposes. However, the estimated costs of development projects provide basic quantitative measures of the direct economic impacts on the affected environment. Estimated changes in the Seashore's base budget and staffing levels also provide quantitative data.

The Seashore is composed of two separate and distinct units. On Fire Island, the barrier island running parallel to the south shore of Long Island in Great South Bay, the Seashore encompasses several major sites and facilities. Fire Island is accessible by vehicle at its eastern and western-most boundaries via bridges, causeways, and roadways traversing Shirley/ Mastic and West Islip, respectively. Ferries depart for Fire Island from four Long Island locations including Bay Shore, Sayville, and two locations in Patchogue. Located on the south shore of Long Island in the town of Brookhaven, the William Floyd Estate borders the village of Mastic Beach. Most visitors traveling to the William Floyd Estate drive through the central business district of the village. These communities provide a range of goods and services for the visiting public, housing for Seashore employees and other workers employed in tourism-related businesses,

and also serve as the base of operations for construction firms, vendors, and other firms providing Seashore support functions.

The resource-specific context for assessing the significance of impacts on the socioeconomic environment includes the following:

- The degree to which NPS provides for the stewardship of the coastal environment and its cultural and natural systems, while recognizing that Fire Island is part of a larger ecological, social, economic, and cultural context.
- The degree to which land-use and development practices promote ecological health and environmental quality on Fire Island and acknowledge and respect community character and the continued presence of Fire Island's communities.
- The degree to which visitation trends, Seashore operations, and construction activities affect the local and regional economy.

SOCIOECONOMIC ENVIRONMENT

IMPACTS COMMON TO ALL MANAGEMENT ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the NPS would continue to engage in baseline research, inventory and monitoring, and management of natural resources in the Seashore and would expand upon existing efforts to address marine resources within the Seashore boundary. Efforts to preserve the Sunken Forest and other maritime forests on Fire Island would also continue.

The results of the Community Character analysis undertaken in 2010 indicated that the preservation of the natural environment was an important facet of community character on Fire Island. Under Alternatives 2 and 3, the NPS would seek to engage in cooperative stewardship of the Seashore's resources and encourage a holistic, multilateral approach to preserving Fire Island's natural environment. This would be of long-term benefit in preserving Fire Island's overall character as well as that of its individual communities.

There are no natural resource management actions proposed under Elements Common to All Alternatives that would have an impact on land use and development or the local and regional economy.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Elements common to all alternatives related to cultural resource management would have no noticeable impact on the socioeconomic environment.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Under all alternatives, there are a number of proposals related to coastal land use and shoreline management that would be likely to have an impact on land use and development and on community character. These proposals are not likely to have a noticeable impact on the local or regional economy.

Under all alternatives, the NPS would adopt the Tentative Federally Supported Plan associated with the Fire Island to Montauk Point (FIMP) Reformulation Study. Under Alternatives 2 and 3, the NPS would engage in a multilateral effort to develop a Coastal Land Use and Shoreline Management Plan and continue to pursue land protection strategies such as employing retained use and occupancy and conservation easements. Cooperative stewardship would be fundamental to the future success of these proposed undertakings, which could have a long-term benefit in preserving the character of Fire Island and promoting land-use and development strategies that would enhance the resiliency of the island communities.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Elements common to all alternatives related to Seashore experience, interpretation, education, and outreach would have no noticeable impact on the socioeconomic environment.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under all alternatives, the Seashore would continue to emphasize water-based transportation to Fire Island and to maintain its roadless character. Driving on Fire Island would continue to be strictly limited. These actions would continue to be of benefit to the long-term preservation of the overall character of Fire Island and its communities. Also under all alternatives, a number of strategies would be employed to improve wayfinding to and from the William Floyd Estate. Vehicular traffic to the Floyd Estate would continue to be directed through Mastic Beach's central business district. The continuation of these actions would have a beneficial impact on the local and regional economy.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under Alternatives 2 and 3, the NPS would engage local and regional stakeholders in the cooperative stewardship of Fire Island National Seashore. To accomplish this, the NPS would propose the creation of a regular forum for communication, cooperation, and collaboration in managing Fire Island. The plan identifies two different proposals for creating such a forum.

The Fire Island National Seashore Advisory Commission model would be purely advisory and could make recommendations to the Superintendent relative to the application of the federal zoning standards and other Fire Island-wide matters. Under the Management Partnership model, participating stakeholders would

play a planning and advisory role, but would not have any regulatory authority except as it pertains to their individual missions and mandates.

Either of the two would have the potential to improve decision-making processes related to the application of federal zoning standards on Fire Island by making them more transparent and inclusive. They would also enhance opportunities to recognize and protect the character of Fire Island and its distinctive communities. The common denominator in each of these models is that they present an opportunity to build a multi-lateral consensus around a vision for Fire Island and better enable a collaborative approach for attaining it. These actions would be of long-term benefit in the management of land use and development on Fire Island and the protection of the island's overall character.

The proposed actions would not have a noticeable impact on the local and regional economy.

SOCIOECONOMIC ENVIRONMENT

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the Natural Resource Management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Management of the Seashore's cultural resources would remain unchanged. Under this alternative, cultural resource management activities would continue to focus exclusively on the federal lands in general, and on the Fire Island Light Station, Carrington Estate, and the William Floyd Estate in particular.

There would be no noticeable impact to land use and development, Fire Island character, or the local or regional economy.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the Land-Use and Development components of Alternative 1 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, the Seashore would continue to rely on existing land-use regulations that apply to the Community Development District, including federal zoning standards. These regulatory tools have limitations and have not been evenly employed, resulting in imperiled coastal properties and a gradual yet continuous erosion of Fire Island's overall character as well as that of some of its communities. The land-use and development actions proposed under Alternative 1 would have a long-term, adverse impact on land use and development and Fire Island character. The proposed actions would not have a noticeable impact on the local or regional economy.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under this alternative, the park experience would remain somewhat segmented on Fire Island, with visitors to Seashore facilities largely staying within those facilities and visitors and local residents of communities largely staying within their individual communities. Current efforts to raise awareness of the Seashore would continue. The NPS would continue to offer a broad slate of visitor programs at selected locations on a limited schedule as funding and staffing permit. The Seashore's informational website, social media presence, exhibits, signage, and publications would continue to be available.

Under this alternative, visitation to Fire Island is expected to remain at current levels. The median for annual Seashore visitation between 2002 and 2012 was approximately 616,000. In 2012, the NPS issued a major report on the effect of visitor spending at national park units on the local, state, and national economy.[13] The 2012 report evaluated the impacts of visitation to Fire Island on the regional economy based on the Seashore's visitation at the time which was 483,000 recreational visits. At this level of visitation, the Visitor Spending Effects (VSE)

13 Cullinane Thomas, C., C. Huber, and L. Koontz. 2014. 2012 National Park visitor spending effects: Economic contributions to local communities, states, and the nation. Natural Resource Report NPS/NRSS/EQD/NRR—2014/765. National Park Service, Fort Collins, Colorado. (www.nature.nps.gov/socialscience/docs/NPSVSE2012_final_nrss.pdf)

model projected total visitor spending within the region to be approximately $ 19 million with the potential to directly and indirectly support about 206 jobs.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the Transportation and Access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore Operations, Maintenance, and Facilities components of Alternative 1 would be similar to those described in the "Impacts Common to All Alternatives" section. The Seashore's 2012 budget was approximately $4.9 million, a significant proportion of which was dedicated to personnel. The Seashore employs approximately 65 Full-Time Equivalents – a combination of year-round and seasonal employees that translates into approximately 109 jobs.

If level funding of the Seashore's operating budget were to continue, staffing and expenditures related to Seashore operations, maintenance, and facilities could remain the same or decline. There would be no noticeable impact to land use and development, Fire Island character, or the local or regional economy.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact the socioeconomic environment within and near the Seashore. These actions include the 2011-2014 New York State Transportation Improvement Program (STIP), the New York Metropolitan Transportation Council 2010 – 2035 Regional Transportation Plan, the Long Island Comprehensive Regional Sustainability Plan 2035, the Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Great South Bay Hard Clam Restoration Project, and the Brookhaven 2030 plan.

The NY Metropolitan Transportation Council, the Long Island Comprehensive Regional Sustainability Plan, the Long Island South Shore Estuary Reserve Plan, and the Brookhaven 2030 Plan all express a region-wide desire to enhance the regional environment and economy and to improve the quality of life for local residents. The regional transportation plan calls for a nearly $50 billion program to improve the transportation system in the metro New York area – including Long Island – between 2010 and 2035. The 2011-2014 New York State Transportation Improvement Program (STIP) includes a variety of transportation projects throughout the state, several of which could affect access and circulation related to Fire Island National Seashore. In particular, proposed improvements to infrastructure at the Ocean Beach Ferry Terminal on Fire Island and the Bay Shore ferry terminal on Long Island would enhance water access to Fire Island passenger services and freight; and the proposed replacement of the William Floyd Parkway Bridge over Narrow Bay at Smith Point County Park would sustain public access and improve safety. Collectively, these improvements would cost over $16 million to undertake.

In the Long Island Regional Comprehensive Sustainability Plan 2035 prepared by the Long Island Regional Planning Council, another primary area of emphasis is promoting economic strength on Long Island. Efforts to increase economic activity and competitiveness were highlighted among the high- priority initiatives. A 2003 Suffolk County report analyzing the impacts of Atlantic beach economy estimated over 11.3 million visits to area beaches each year with about 2.2 million (20 percent) of them being visitors to Fire Island (including the communities).

With its emphasis on improvements to water quality, expansion of public use and enjoyment of the South Shore Estuary Reserve (SSER), sustaining and expanding the estuary-related economy, and increasing education, outreach, and stewardship, the Long Island South Shore Estuary Reserve Comprehensive Management Plan offers an agenda that supports the protection and use of the Great South Bay, a shared resource. As such, the SSER plan would also reinforce the preservation of the character of Fire Island and contribute to the local and regional economy.

The Great South Bay Hard Clam Restoration Working Group was convened by the Suffolk County Executive in 2008 and was tasked with: (1) Ensuring adequate enforcement of hard clam harvest laws, regulations, and codes in Great South Bay; (2) Establishing interim hard clam harvest management recommendations for the Great South Bay; and (3) Developing a long term, science-based, sustainable management plan for the hard clam population of Great South Bay. The resulting Great South Bay Hard Clam Restoration Project calls for a multi-pronged approach to harvest management and efforts to address the environmental factors (e.g. water quality) that are negatively impacting hard clam growth and survival.

Shellfishing could be limited in some areas of Great South Bay (including areas within the Seashore boundary) for the duration of the Hard Clam Restoration Project, resulting in long-term adverse impacts to segments of the local economy.

These actions would result in a long-term beneficial impact on the socioeconomic environment related to Fire Island National Seashore. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term minor and adverse effects of Alternative 1, would be long-term beneficial. Alternative 1 would contribute imperceptible minor adverse and beneficial increments to the overall beneficial impact.

Conclusions

Overall, impacts to the socioeconomic environment associated with Alternative 1 would result in both beneficial and adverse impacts. Under Alternative 1, benefits to community character and land use and development would be derived from the preservation of natural resources and maintaining the roadless character of the island and water-based transportation. The NPS would continue current practices to address land use and development issues on Fire Island which would result in noticeable adverse impacts on the overall character of Fire Island and on land use and development over time. There are no proposed actions under this alternative that would have a noticeable impact on the local or regional economy.

The cumulative impact would be long-term beneficial, and Alternative 1 would contribute imperceptible long term minor adverse and beneficial increments to the overall beneficial cumulative impact.

Based on this information, the largely beneficial impacts of Alternative 1 on the socioeconomic environment would not be considered significant. The impacts of some actions under consideration would be readily detectable and beneficial. However, most actions would not result in substantive impacts that would change how the Seashore operates within its regional context, its protection of ecological health and environmental quality and the overall character of Fire Island, or its influence on the local or regional economy. The socioeconomic environment would be minimally affected under this alternative. The adverse impacts as described above would be considered significant over the long term relative to land use and development and the overall character of Fire Island. This would result from the failure to adequately address land-use and development practices which could result in incremental erosion of ecological health and environmental quality as well as the overall character of Fire Island.

SOCIOECONOMIC ENVIRONMENT

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the Natural Resource Management components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, natural area restoration efforts proposed under this alternative could alter visitation patterns and may have an impact on visitor numbers and audience composition. A reduction in visitation could have an adverse impact on the local and regional economy.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

As in Alternative 1, the management of the Seashore's cultural resources within Fire Island National Seashore would remain largely unchanged. Under this alternative, cultural resource management activities would continue to focus exclusively on the federal lands in general, and on the Fire Island Light Station, Carrington Estate, and the William Floyd Estate in particular.

Under Alternative 2, at the William Floyd Estate the interiors of the Old Mastic House would be reorganized resulting in the removal of the exhibit area and the sales space from the historic structure and refurnishing those spaces for use in the interpretation of the home. Missing historic features would be marked and interpreted to help visitors better understand the history of the Estate. The Lower Acreage would be rehabilitated and portions of the landscape would be restored as "landscape vignettes" to allow for the interpretation of different periods in the Estate's history (e.g., planting a single cultivated field, recreating a garden). These changes are likely to inspire a spike in visitation at the Estate as visitors come to experience a particular new feature. This would likely be a short-term benefit to the Estate's visitation that would expose more people to the site and possibly broaden its

visitation over the long term. These projected changes in visitation are likely to be of long-term benefit to the local and regional economy.

There would be no noticeable impact to land use and development or Fire Island character.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. Under this alternative, the NPS would offer technical assistance to Fire Island communities to identify and preserve their distinctive character and that of Fire Island as a whole. This could raise awareness of the relevance of these features and may produce land-use and development guidelines or other strategies that would be of long-term benefit to protecting the overall character of Fire Island and its distinctive communities.

Also under this alternative, the NPS would work to revise land-use regulations to address inconsistencies, provide better procedural guidance, and more clearly define the role of the NPS. Alternatives to traditional zoning (performance-based measures, etc.) would also be considered. These proposed actions could improve the content and processes related to the federal zoning standards by making them more transparent and easier to use.

The NPS would also pursue the realignment of the federal dune district to make it consistent with the state-delineated CEHA district as appropriate. In effect, this would better address development proposals on Fire Island and be of long-term benefit in managing land use and development, promoting the long-term resilience of Fire Island communities and preserving the overall character of the island.

In general, these actions would have a long-term beneficial impact on managing land use and development and preserving the overall character of Fire Island.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under Alternative 2, the number of visitor facilities on Fire Island would be reduced in most locations including Sailors Haven, Talisman, and the Wilderness Visitor Center. The Sailors Haven marina would be removed at the end of its structural lifecycle though the area would continue to be served by ferry. Lifeguarded beaches would remain at Sailors Haven and Watch Hill. In addition, the NPS would also expand educational and interpretive outreach to a wide range of audiences and communities in the region.

As noted in the Impacts to Visitor Use & Experience section, these proposed changes would likely reduce visitation to these sites and facilities. On the other hand, the increased educational and interpretive outreach could result in periodic boosts in visitation that would offset the loss that could be attributed to the reduction of visitor facilities. A decline in visitation to Fire Island would result in a corresponding long-term adverse impact on the regional economy.

The reduction in the availability of overnight boat slips would likely drive a number of private boaters to other public and private marinas on Fire Island and on the south shore of Long Island. This could result in long-term impacts on the local economy, particularly sectors that serve the boating community.

With fewer services at these locations, adjoining communities that offer amenities like restaurants and stores (e.g., Cherry Grove) may experience more visitation. This would be likely to result in more local sales and revenue.

At the William Floyd Estate, the NPS would rehabilitate and expand existing facilities to create a visitor orientation facility that would provide a versatile and safe indoor orientation and program space for a variety of audiences. Interpretive and educational programming would emphasize regional and community connections with a strong emphasis on outreach to local schools. A variety of programs would be developed that would encourage repeat visitation. Rehabilitation of the cultural landscape and the introduction of landscape vignettes (e.g., a garden, cultivated fields) would generate visitor interest. Improvements like the visitor orientation facility, increased outreach to local schools and other audiences, and an emphasis on attracting repeat visitation could be of long-term benefit in terms of increased visitation and broader audiences. This would be of long-term benefit to the local economy.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. Also under this alternative, the NPS would work with local and regional transit agencies to promote the use of public transportation while raising public awareness of

Fire Island as a destination. This type of public outreach could result in modest increases in visitation numbers that could offset the impacts of other actions and benefit the local tourist economy.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, under this alternative a number of facilities would be newly constructed, rehabilitated, or demolished. A proportion of the estimated construction-related expenditures would be spent on Long Island, contributing directly to local sales and resulting in short-term benefits to the local and regional economy.

In addition, up to six additional full-time equivalents (FTE) may be required to implement this alternative. Positions related to natural resource management, cultural resource management, educational outreach, and planning and community outreach would be needed.

Under this alternative, the Seashore's operating budget would grow modestly as would staffing and expenditures related to Seashore operations, maintenance, and facilities. This would be of long-term benefit to the local and regional economy.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact the socioeconomic environment within and near the Seashore. These actions include the 2011-2014 New York State Transportation Improvement Program (STIP), the New York Metropolitan Transportation Council 2010 – 2035 Regional Transportation Plan, the Long Island Comprehensive Regional Sustainability Plan 2035, the Long Island South Shore Estuary Reserve Comprehensive Management Plan; the Great South Bay Hard Clam Restoration Project, and the Brookhaven 2030 plan.

These actions would result in a long-term beneficial impact on the socioeconomic environment related to Fire Island National Seashore. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term minor and adverse effects of Alternative 2, would be long-term beneficial. Alternative 2 would contribute minor adverse and beneficial increments to the overall beneficial impact.

Conclusions

Overall, impacts to the socioeconomic environment associated with Alternative 2 would be largely localized though some impacts may affect the regional tourist economy and would range from long-term beneficial to long term and adverse. Under Alternative 2, long-term benefits to community character and land use and development would be derived from the preservation of natural resources; coastal land use and shoreline management planning; maintaining the roadless character of the island and water-based transportation; and pursuing a cooperative stewardship model of governance. A number of land-use and development proposals, including technical assistance to Fire Island communities seeking to identify and preserve their distinctive community character; and revisions to land-use regulations including alternatives to traditional zoning, would be of long term benefit to the overall character of Fire Island and to the management of land use and development. Proposed changes related to the Seashore experience, particularly the reduction or removal of visitor facilities and the Sailors Haven marina on Fire Island could result in a minor reduction in visitation which could have a long-term adverse impact on the regional tourist economy. On the other hand, proposed changes at the William Floyd Estate including the rehabilitation of existing buildings to create a visitor orientation facility and rehabilitation of the cultural landscape and other historic features, could increase visitation to that property with the corresponding benefits that may accrue to the local and regional economy. Proposed construction under this alternative would be of short-term benefit to the local and regional economy. Proposals to expand the park staff to meet the implementation requirements under this alternative would be of long-term economic benefit.

The cumulative impact would be long-term beneficial, and Alternative 2 would contribute minor adverse and beneficial increments to the overall beneficial cumulative impact.

Based on this information, the beneficial impacts of Alternative 2 on the socioeconomic environment would be considered significant. Many of the proposed actions described above would result in readily detectable and substantive impacts that would improve the stewardship of seashore resources with greater appreciation of their regional context. They would result in land use and development practices that better address ecological health, environmental quality, and community

character to a greater degree than under Alternative 1. Conversely, the adverse impacts of Alternative 2 on the socioeconomic environment would not be considered significant. The socioeconomic environment would be largely beneficially affected under this alternative.

SOCIOECONOMIC ENVIRONMENT

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the Natural Resource Management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" and "Impacts of Alternative 1" sections.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under Alternative 3, the Seashore's focus would expand to consider cultural resources in a greater Fire Island-wide context. The NPS would complete a Cultural Landscape Report that considers the entire area of Fire Island encompassed by the National Seashore including both federal and non-federal lands. This would not only provide important contextual information that would inform the management of cultural resources on federal lands, but it could also serve as a useful source of data for Fire Island communities, the towns, and the county in their efforts to identify and protect the features that define the overall character of Fire Island and its distinctive communities. To a similar end, NPS would collaborate with the NYSHPO and interested local communities to undertake a formal inventory of historic resources on Fire Island.

The analysis of the impacts of cultural resources components for the William Floyd Estate under this alternative would be the same as that described under Alternative 2.

These proposed actions would be of long-term benefit to identifying and protecting Fire Island's overall character. Proposals related to the William Floyd Estate are likely to have a beneficial impact on the local and regional economy.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section and under Alternative 2.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under Alternative 3, the interpretive emphasis is expanded to consider the natural and cultural heritage of Fire Island as a whole as well as its regional context. Visitors would be encouraged to visit and participate in programming and events at related sites and museums on Long Island that expand upon the themes of Fire Island. The NPS would also expand programming for the shoulder season (e.g., proposed residential environmental camp). These proposed actions could result in minor growth in visitation to Fire Island National Seashore and a corresponding long-term benefit to the regional economy.

The analysis for the impacts of Seashore experience, interpretation, education, and outreach components to the socioeconomic environment for the William Floyd Estate under this alternative are the same as those described under Alternative 2.

These proposed actions would not have a noticeable impact on land-use development or Fire Island character.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. As under Alternative 2, under this alternative the NPS would work with local and regional transit agencies to promote the use of public transportation while raising public awareness of Fire Island as a destination. This type of public outreach could contribute to increases in visitation numbers and benefit the local economy.

In addition, NPS would work with ferry concessioners to expand service during the shoulder season to specific destinations on Fire Island and would also explore the possibility of providing a subsidy to reduce fares or offering a waiver – particularly for underserved school districts and low-income families. These actions could also contribute to increasing visitation numbers, which would result in a corresponding long-term benefit to the regional economy.

These proposed actions would not have a noticeable impact on land use and development or Fire Island character.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would be similar to those described in the "Impacts Common to All Alternatives" section. In addition, under this alternative a number of facilities would be newly constructed or rehabilitated. A proportion of the construction-related expenditures as estimated would be spent on Long Island, contributing directly to local sales and short-term benefits to the local and regional economy.

In addition, up to two additional full-time equivalents (FTE) may be required to implement this alternative. Positions related to natural resource management, and planning and community outreach would be needed.

Under this alternative, the Seashore's operating budget would grow modestly as would staffing and expenditures related to Seashore operations, maintenance, and facilities. This would be of long-term benefit to the local economy.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have the potential to impact the socioeconomic environment within and near the Seashore. These actions include the 2011-2014 New York State Transportation Improvement Program (STIP), the New York Metropolitan Transportation Council 2010 – 2035 Regional Transportation Plan, the Long Island Comprehensive Regional Sustainability Plan 2035, the Long Island South Shore Estuary Reserve Comprehensive Management Plan, the Great South Bay Hard Clam Restoration Project, and the Brookhaven 2030 plan.

These actions would result in a long-term beneficial impact on the socioeconomic environment related to Fire Island National Seashore. The cumulative impact of these actions, in combination with the long-term beneficial and the long-term minor and adverse effects of Alternative 3, would be long-term beneficial. Alternative 3 would contribute a largely beneficial increment to the overall beneficial impact.

Conclusions

Overall, impacts to the socioeconomic environment associated with Alternative 3 would largely affect the local communities though some impacts may affect the regional tourist economy and would range from long-term beneficial to long term and adverse. Under Alternative 2 long-term benefits to community character and land use and development would be derived from the preservation of natural resources, coastal land use and shoreline management planning, maintaining the roadless character of Fire Island and water-based transportation, and pursuing a cooperative stewardship model of governance. A number of land-use and development proposals including technical assistance to Fire Island communities seeking to identify and preserve their distinctive community character, and revisions to land-use regulations including alternatives to traditional zoning would be of long-term benefit to the overall character of Fire Island and on the management of land use and development. Proposed changes related to the Seashore experience, particularly the greater emphasis on the natural and cultural heritage of Fire Island and its regional context and expanding shoulder season programming would result in increased visitation and would be of long-term benefit to the regional economy. Proposed construction under this alternative would be of short-term benefit to the local and regional economy. Proposals to expand the park staff to meet the implementation requirements under this alternative would be of long-term benefit economically.

The cumulative impact would be long-term beneficial, and Alternative 3 would contribute a beneficial increment to the overall cumulative beneficial impact.

Based on this information, the beneficial impacts of Alternative 3 on the socioeconomic environment would be considered significant. Many of the proposed actions described above would result in readily detectable and substantive impacts that would improve the stewardship of seashore resources with greater appreciation of their regional context. They would result in land use and development practices that better address ecological health, environmental quality, and community character to a greater degree than under either Alternative 1 or Alternative 2 because of their emphasis on a more holistic approach to resource management and interpretive outreach to related sites and museums on Long Island. The adverse impacts of Alternative 3 on the socioeconomic environment would not be considered significant. The socioeconomic environment would be largely beneficially affected under this alternative.

Impacts on Seashore Operations

Methodology

For the purposes of this analysis, Seashore operations refers to the quality and effectiveness of the administrative and physical infrastructure and the ability to maintain the infrastructure used in the operation of the Seashore. The recognition of the need for a practical approach to cooperative stewardship – the communication, collaboration, and cooperation among the many stakeholders having management responsibilities on Fire Island -- has led to the exploration of several organizational models. The potential impacts of the proposed organizational models on Seashore operations are also considered in this analysis. This analysis also considers staffing proposed under each alternative.

The resource-specific context for assessing the significance of impacts on the seashore operations includes the following:

- Degree to which the NPS partners with the public, Fire Island communities, state and local government, and others in the stewardship and preservation of Fire Island's natural and cultural resources and its distinctive character.
- Degree to which the Seashore would operate within the constraints of the unit-specific budget and number of staff positions that have been allocated by Congress and the NPS Director's Office.
- Degree to which facilities are developed to be environmentally sensitive and sustainable and can be adapted to the changing environment as influenced by climate change and sea-level rise.
- Degree to which the Seashore provides a safe, healthy, and accessible environment for visitors, residents, and NPS employees.

SEASHORE OPERATIONS

IMPACTS COMMON TO ALL MANAGEMENT ALTERNATIVES

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the NPS would also continue to engage in research initiatives, planning, monitoring, public education, and public outreach. Under Alternatives 2 and 3, NPS would expand its management emphasis to include the marine areas within the Seashore boundary to be consistent with recent NPS initiatives calling for enhanced marine stewardship. These efforts would require staff time and oversight that exceeds the Seashore's current capacity and could have a long-term adverse impact on park-wide operations and management.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Under all alternatives, the impacts associated with cultural resource management proposals would be similar to those described under natural resource management. The NPS would also continue to engage in research initiatives, planning, public education, and public outreach. These efforts would require staff time and oversight that exceeds the Seashore's current capacity and could have a long-term, adverse impact on park-wide operations and management.

Also, under all alternatives, the Carrington House and Cottage would be rehabilitated and adaptively reused for administrative purposes. The house and cottage would be placed on the Seashore's List of Classified Structures and would be managed as a cultural resource. Although already part of the Seashore's inventory of structures, the Carrington House and Cottage had previously received little attention. These structures would be returned to the inventory of structures requiring regular maintenance and utility services, creating a long-term impact on the Seashore's budget and operations.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Under all alternatives, the NPS would continue to be engaged in planning and management proposals related to FIMP. Public education and outreach would also continue to be important relative to land-use and development proposals. All of these continuing and proposed initiatives would require substantial involvement of Seashore staff and may require the addition of specialized staff or consultants. Requirements for staff time could exceed the Seashore's current capacity and could have a long-term adverse impact on park-wide operations and management.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Under all alternatives, educational outreach, collaboration with sites related to the William Floyd Estate, and the increased use of social media for public information, orientation, and wayfinding would be elements common to all alternatives. These proposed actions would require staff time and oversight that exceeds the Seashore's current capacity and could have a long-term adverse impact on park-wide operations and management.

Under Alternatives 2 and 3, the NPS would pursue development of solar shade structures over some or all of the Ferry Terminal parking area. This action would be consistent with the clean energy objectives proposed in the Seashore's Climate Friendly Park Action Plan. This proposed action could expand the Seashore's inventory of structures and may require specialized maintenance, but these impacts could be offset by the long-term benefits of reduced energy costs and a smaller carbon footprint.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Under Alternatives 2 and 3, the Seashore would coordinate the transportation of seashore personnel to encourage the use of water-based transportation and reduce the use of vehicles on Fire Island. This proposed action could result in benefits in terms of operational costs and energy efficiency.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Under Alternatives 2 and 3, the NPS would foster cooperative stewardship to improve communication, coordination, and cooperation among those responsible for the management of Fire Island. To that end, two organizational models are proposed for consideration as ways to institute and support cooperative stewardship. They include:

- Fire Island National Seashore Advisory Commission
- Fire Island Management Partnership.

These organizational models are described in greater detail in Chapter Two. From an operations and management standpoint, each model would require the commitment of some additional Seashore staff time. The level of staff involvement could vary appreciably based on which model advances and how it is finally structured. All staff support to the Fire Island National Seashore Advisory Commission would be provided by the Seashore. In the case of the Management Partnership, the administrative structure could vary significantly as would the degree of Seashore staff involvement. The creation of a cooperative stewardship organizational structure would have a long-term impact on the Seashore's administration and could exceed its current staffing capacity in terms of FTE and required skill sets.

It is important to note that even in the absence of a formal organizational structure, a commitment to cooperative stewardship would have a similar impact on the Seashore's administration. However, the returns derived from the practice of cooperative stewardship in terms of more firmly established and collaborative approach to protecting Fire Island would be of long-term benefit relative to Seashore operations.

In that vein, under all alternatives, the Seashore would continue to work through partners, cooperators, and concessioners to advance its management objectives. The NPS would continue to participate in the Fire Island Law Enforcement, Safety, and Emergency Council (FILSEC).

It would also continue to work with the Fire Island Lighthouse Preservation Society to preserve and interpret Fire Island Light and would seek to develop a similar working relationship with a future partner at the William Floyd Estate. The Seashore would prepare a Commercial Services Plan to establish priorities and guide decision making as it pertains to seeking out partners and concessioners to operate and manage visitor facilities. These practices would enable the Seashore to manage a diversity of resources and serve a broader public while reducing direct impacts to the Seashore's operations and maintenance functions. The continuation of these practices would be of long-term benefit to the Seashore's operations and maintenance.

Under all alternatives, the NPS would take advantage of recurrent maintenance schedules to opportunistically evaluate and upgrade Seashore facilities to address any issues related to sustainability, operational efficiency, or universal accessibility. Overtime, this would enable the Seashore to achieve the objectives outlined in its Climate Friendly Parks Action Plan and reduce its carbon footprint, realize operational cost savings, and provide greater universal access. This proposed strategy would be of long-term benefit to the Seashore's operation and maintenance.

Also under all alternatives, the NPS would continue to provide some staff housing, though the number of units could vary per alternative. Fire Island National Seashore operates within one of the most expensive housing markets in the country. In 2010, the median home value in Suffolk County was $424,000 and the median rent was $1,461. Opportunities for affordable seasonal housing on Long Island and Fire Island are limited. This is coupled with the fact that transportation access to Fire Island can be restrictive particularly when accommodating regularly scheduled work hours. The continued provision of staff housing would make it possible to attract qualified seasonal labor and to address operational needs and efficiencies. This would be of long-term benefit to Seashore operations.

Finally, under all alternatives, the NPS would work to ensure that the Seashore's landward and marine boundaries are properly delineated and marked using physical markers, analog maps, and digital media (e.g., NOAA's digital charts and GPS). Clarifying the Seashore's boundary would better enable the park to address jurisdictional issues pertinent to a number of management initiatives and collaborative opportunities. This proposed action would be of long-term benefit to the Seashore's operation and maintenance.

SEASHORE OPERATIONS

IMPACTS OF MANAGEMENT ALTERNATIVE 1

Continuation of Current Management Practices (No Action)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the Natural Resource Management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the Cultural Resource Management components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 1 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 1 would include those described in the "Impacts Common to All Alternatives" section. In addition, under

Alternative 1, the William Floyd Estate maintenance area, which also serves the east end of Fire Island, would continue to consist of a collection of small sheds located in the park support area of the property. In their current configuration, the sheds do not offer sufficient indoor workspace to complete many maintenance and preservation tasks. The continued reliance on this poorly configured maintenance facility results in operational inefficiencies (e.g., tasks that require an indoor space must be transported to and from the primary maintenance facility located 30 minutes away) and would continue to have an adverse impact on Seashore operations.

Also under this alternative, the Kismet Fire House, an NPS-owned structure, would be returned to the Seashore's inventory upon the expiration of its lease in 2014. The structure would then have to be maintained by the Seashore. This proposed action would have a long-term, adverse impact on Seashore operations.

The proposals described under Elements Common to All Alternatives, added to the current management responsibilities described under this alternative, would exceed the current capacity of the Seashore staff.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on Seashore operations, maintenance, and facilities beyond what is described under this alternative.

Conclusions

Overall, impacts associated with Alternative 1 would be highly localized, long-term, and adverse relative to Seashore operations, maintenance, and facilities. In general, most of the impacts are associated with the combined effects of proposals found under common to all alternatives and under Alternative 1 in that they would be likely to have a long-term impact on the capacity of the Seashore staff in terms of FTE, knowledge, and skills. Also under Alternative 1 the inventory of buildings that must be maintained by the Seashore grows with the rehabilitation of the Carrington House and cottage and the expiration of the lease on the Kismet Fire House. There would be no corresponding increase in operating funds to address the long term maintenance of these facilities. Finally, the continued reliance on the maintenance sheds at the William Floyd Estate would continue to impact operational efficiencies at the Seashore.

Based on this information, the beneficial impacts of Alternative 1 on the Seashore operations would not be considered significant. The adverse impacts would be considered significant because of the degree to which they are likely to exceed existing park budget and staffing constraints. They would also be unable to provide for efficient indoor work space at the William Floyd maintenance complex.

SEASHORE OPERATIONS

IMPACTS OF MANAGEMENT ALTERNATIVE 2

Enhancing Natural Resource Values

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. Under this alternative, the NPS would focus management efforts on the restoration of the natural landscape as feasible. The Seashore would undertake a more aggressive program to eradicate non-native species, and increase educational outreach and programming. These efforts would require the support of additional staff, cooperators, and/or volunteers and could have long-term impacts on Seashore operations.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. At the William Floyd Estate, the cultural landscape would be rehabilitated with the possible reintroduction of some cultivated fields. There would be no noticeable impact to the Seashore's operations, maintenance and facilities.

▸ IMPACTS RELATED TO LAND-USE AND DEVELOPMENT ACTIONS

Impacts associated with the land-use and development components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, under this alternative, the NPS would engage in community outreach and technical

assistance in support of identifying and preserving the distinctive character of Fire Island communities. The NPS would also revise land-use regulations to address inconsistencies, provide better procedural guidance, and more clearly define the NPS role. The implementation of these proposed actions would require substantial staff involvement and would have a long-term impact on Seashore operations.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 2 would include those described in the "Impacts Common to All Alternatives" section. In addition, under this alternative a number of visitor facilities would be removed to make way for restoration of natural areas, including structures at Talisman, Sailors Haven, and the Wilderness Visitor Center. The Wilderness Visitor Center would be replaced with a smaller -scale, multi-function structure and a covered outdoor program space would be constructed at Sailors Haven. An electronic vehicle entrance gate would be installed near the Wilderness visitor facility to manage vehicular access at the east end of Fire Island National Seashore.

Also under this alternative, lifeguards would continue to staff the ocean beaches at Sailors Haven and Watch Hill; however there would no longer be lifeguards at Talisman. The Seashore would delineate a bayside water trail along the shore of Fire Island. Seashore staff would offer periodic water trail excursions and would oversee the development and distribution of brochures, guides, and digital media regarding the trail.

Under Alternative 2, the NPS would also develop and install orientation panels at the Long Island ferry terminals. An orientation panel specific to the William Floyd Estate would also be installed at an off-site location within the Village of Mastic Beach. Also at the William Floyd Estate, existing visitor facilities would be rehabilitated and expanded to create an indoor flexible program space and an adjoining covered outdoor space.

The proposed removal of a proportion of the infrastructure and facilities on Fire Island could result in savings relative to labor, energy, transportation costs, and materials, but those savings would be somewhat offset by the smaller structures proposed in their stead and the modification of facilities proposed for the William Floyd Estate. Likewise, while Talisman would no longer be protected as a life-guarded swimming beach, the proposed water trail would require additional staff time. In effect, these proposals would result in a long-term impact on Seashore operations.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTION

Impacts associated with the transportation and access component of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 2 would be the same as those described in the "Impacts Common to All Alternatives" section.

In addition, under Alternative 2, the NPS would build upon the existing maintenance shop at the William Floyd Estate park support area to develop a consolidated preservation maintenance facility. Maintenance functions would now be consolidated in a single building that would enable indoor work to be performed on site. This maintenance facility would continue to serve the east end of Fire Island as well as the William Floyd Estate. The development of this consolidated facility would address the operational inefficiencies associated with the current maintenance scenario and would be of long-term benefit to park operations, maintenance, and facilities.

Also under Alternative 2, the NPS would reduce the number of available Seashore housing units on Fire Island. In general, the rents charged to park tenants cover the cost of maintenance and utilities so this would not necessarily result in a noticeable impact to the Seashore's maintenance costs. However, the reduction in available housing units could have an impact on the Seashore's ability to attract and retain qualified seasonal and year-round staff which could have a long-term adverse impact on Seashore operations.

Under this alternative, the NPS would narrow the number of services provided by private concessioners on Fire Island and would assume responsibility for the management of the campground at Watch Hill. The NPS would expand the Seashore staffing to meet operational needs in areas of resource management, educational outreach, planning and community outreach, and visitor and resource protection. The Seashore would also work to expand its corps of volunteers to perform a wide

variety of functions. Within the context of Alternative 2, these proposed actions would enable the Seashore to improve the delivery of services, retain and reinvest the proceeds derived from campground operations, and provide the level of staffing necessary to meet the requirements of the plan. These proposals would largely be of long-term benefit to Seashore operations.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on Seashore operations, maintenance, and facilities beyond what is described under this alternative.

Conclusions

Overall, operations impacts associated with Alternative 2 would largely be localized and would have both beneficial and adverse impacts on Seashore operations, maintenance, and facilities. Most of the adverse impacts related to Alternative 2 would be associated with changes to staffing composition and workloads. In terms of benefits, the improvements to the maintenance facility at the William Floyd Estate and the proposed additions to the Seashore staff would address operational needs and improve operational efficiencies. As noted previously, there would be some benefits to Seashore operations, maintenance, and facilities associated with Elements Common to All Alternatives including the proposed installation of solar shade structures at the Patchogue Ferry Terminal parking area, and the coordination of personnel transportation to and from Fire Island.

Based on this information, the beneficial impacts of Alternative 2 on the Seashore operations would be considered significant and would result in expanded use of partners to achieve objectives, and facility improvments making them more ecologically sensitive and sustainable. In the case of improvements to the William Floyd Estate maintenance facility, maintenance activities requiring indoor workspace could be carried out with much greater efficiency. The adverse impacts would be considered significant as they are likely to exceed existing park budget and staffing constraints to a greater degree than under Alternative 1.

SEASHORE OPERATIONS

IMPACTS OF MANAGEMENT ALTERNATIVE 3

Recognize the Relationship between Human Use and Nature (Preferred Alternative)

Impact Analysis

▸ IMPACTS RELATED TO NATURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the natural resource management components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO CULTURAL RESOURCE MANAGEMENT ACTIONS

Impacts associated with the cultural resource management components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. Also under Alternative 3, the NPS would expand the existing curatorial storage facility to address workspace and storage needs for the Seashore's collections. This would nearly double the size of the existing facility, but the installation of energy efficient lighting and heating would mitigate the impact to the Seashore's budget and operations.

▸ IMPACTS RELATED TO LAND USE AND DEVELOPMENT ACTIONS

Impacts associated with the land use and development components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section. As in Alternative 2, under this alternative, the NPS would engage in community outreach and technical assistance in support of identifying and preserving the distinctive character of Fire Island communities. The NPS would also revise land-use regulations to address inconsistencies, provide better procedural guidance, and more clearly define the NPS role. The Seashore would also offer trainings for its management partners and relevant local boards regarding the application of the Secretary's zoning standards. The implementation of these proposed actions would require substantial staff involvement and would have a long-term minor impact on Seashore operations.

▸ IMPACTS RELATED TO SEASHORE EXPERIENCE ACTIONS

Impacts associated with the Seashore experience, interpretation, education, and outreach components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section and similar to many of those identified under Alternative 1. In addition, under this alternative, the NPS would expand its programming during the shoulder season to include dockside programming at the Patchogue Ferry Terminal and the reintroduction of a residential environmental education program that would make use of existing park housing and facilities. The residential environmental education program would be operated by a cooperator. These proposed actions would require additional staff involvement and would have a long-term impact on Seashore operations.

Similar to Alternative 2, the NPS would develop covered outdoor program areas at the Patchogue Ferry Terminal and at Sailors Haven. The NPS would also develop and install an orientation panel specific to the William Floyd Estate at an off-site location within the Village of Mastic Beach. Also at the William Floyd Estate, existing visitor facilities would be rehabilitated and expanded to create an indoor flexible program space and an adjoining covered outdoor space. These proposed structures would be in addition to the Seashore's existing inventory and would require additional time, labor and materials to maintain and would have a long-term impact on Seashore operations, maintenance, and facilities.

Also similar to Alternative 2, the NPS would develop a water trail along the bayside of Fire Island. Under this alternative, the trail would be managed by a concessioner or cooperator that would offer water trail excursions and develop related brochures, guides, and digital media. Under this alternative, this proposal would not have a noticeable impact on Seashore operations.

▸ IMPACTS RELATED TO TRANSPORTATION AND ACCESS ACTIONS

Impacts associated with the transportation and access components of Alternative 3 would be the same as those described in the "Impacts Common to All Alternatives" section.

▸ IMPACTS RELATED TO SEASHORE OPERATIONS ACTIONS

Impacts associated with the Seashore operations, maintenance, and facilities components of Alternative 3 would include those described in the "Impacts Common to All Alternatives" section and would also include those described under Alternative 1.

Also under this alternative, the NPS would expand the Seashore staffing to meet operational needs in areas of resource management, and planning and community outreach. The Seashore would also work to expand its corps of volunteers to perform a wide variety of functions. Under Alternative 3, these proposed actions would enable the Seashore to provide the level of staffing necessary to meet the requirements of the plan and would largely be of long-term benefit to Seashore operations.

As in Alternative 2, the NPS would build upon the existing maintenance shop at the William Floyd Estate maintenance area to develop a consolidated preservation maintenance facility. Maintenance functions would now be consolidated in a single building that would enable indoor work to be performed on site. This maintenance facility would continue to serve the east end of Fire Island as well as the Floyd Estate. The development of this consolidated facility would address the operational inefficiencies associated with the current maintenance scenario and would be of long-term benefit to park operations, maintenance, and facilities.

Cumulative Impacts

There are no related regional plans or initiatives that are expected to have a cumulative impact on Seashore operations, maintenance, and facilities beyond what is described under this alternative.

Conclusions

Overall, the impacts on Seashore operations associated with Alternative 3 would range from long-term and beneficial to long-term and adverse. Most of the impacts related to Alternative 3 would be associated with changes to staffing composition and workloads. Benefits would be realized from the improvements to the maintenance facility at the William Floyd Estate, the reconfiguration of Seashore housing, and the proposed additions to the Seashore staff would address operational needs and improve operational efficiencies, as well as the proposed installation of solar shade structures at the Patchogue Ferry Terminal parking area, and the coordination of personnel transportation to and from Fire Island.

Based on this information, the beneficial impacts of Alternative 3 on the Seashore operations would be similar to Alternative 2 and would be considered significant. Proposed actions would result in expanded use of partners to achieve objectives, and facility improvements that make them more ecologically sensitive and sustainable. In the case of improvements to the William Floyd Estate maintenance facility, maintenance activities requiring indoor workspace could be carried out with much greater efficiency. The adverse impacts would be considered significant as they are likely to exceed existing park budget and staffing constraints to a slightly greater degree than under Alternative 1.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

Management Alternative 1

Under Alternative 1 (No Action), existing conditions may have resulted in unavoidable adverse impacts. The location of the Seashore's headquarters and primary maintenance facility on the edge of the Patchogue River would continue to impact the floodplain, as would most facilities on Fire Island. On non-federal lands within the Seashore boundary, cultural resources would remain undocumented and unprotected. Under this alternative, these resources could be exposed to unavoidable adverse impacts associated with natural processes including climate change and sea-level rise, as well as land use and development actions.

Management Alternative 2

Under Alternative 2, although the number of facilities on Fire Island would be reduced, the remaining facilities would continue to impact the floodplain resulting in an unavoidable adverse impact. The location of the Seashore's headquarters and primary maintenance facility on the edge of the Patchogue River would also continue to impact the floodplain.

Management Alternative 3

Under Alternative 3, existing conditions may have resulted in unavoidable adverse impacts. The location of the Seashore's headquarters and primary maintenance facility on the edge of the Patchogue River would continue to impact the floodplain, as would most facilities on Fire Island.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited period of time.

Management Alternative 1

Under Alternative 1 no actions would be taken that would result in the consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses for a period of time. Thus, there would be no irreversible or irretrievable commitments of natural resources in the park by the NPS.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The park would continue to conduct appropriate cultural resource management in accordance with the Secretary's Standards and NPS policies.

Management Alternative 2

Under Alternative 2, no actions would be taken as a result of this alternative that would result in the consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses for a period of time. Thus, there would be no irreversible or irretrievable commitments of natural resources in the park by the National Park Service.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The park would continue to conduct appropriate cultural resource management in accordance with the Secretary's Standards and NPS policies.

Management Alternative 3

Under Alternative 3, no actions would be taken that would result in the consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses for a period of time. Thus, there would be no irreversible or irretrievable commitments of natural resources in the park by the NPS.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The park would continue to conduct appropriate cultural resource management in accordance with the Secretary's Standards and NPS policies.

5: Consultation & Coordination

SUMMARY OF THE PLANNING PROCESS: The National Park Service takes an interdisciplinary approach to planning. The planning team for the Fire Island National Seashore was composed of individuals skilled in the areas of natural resource management, coastal geology, cultural resource management, land-use planning, community planning, landscape architecture, law enforcement, visitor services, park operations and facility management. The planning team also consulted with technical staff from within the NPS and from other agencies in the areas of climate change and sea-level rise, marine resources, coastal processes, and historic resources.

Leading into the planning process, several research projects were undertaken to provide information with which to make decisions for the Seashore's future. In anticipation of the planning process, a number of white papers were prepared that summarized current conditions and the status of research on a wide range of scientific topics including the bay shoreline, breach management, coastal geomorphology, marine resources, water quality, and white-tailed deer. Scientific research was on going throughout the planning process and new findings were considered as they became available. Other research undertaken in support of the planning process included an analysis of the character of Fire Island's built environment and its distinctive communities; an analysis of the application of land use regulations on Fire Island; a visitor-use survey; and a water-based transportation analysis. An administrative overview of the William Floyd Estate was also prepared to inform the planning process. The information generated by these research projects was incorporated into planning.

PLANNING PROCESS

Project Scoping

The planning process was initiated in May 2006 with an internal scoping meeting held for the Seashore staff. On June 13, 2006 a Notice of Intent to Prepare a GMP/EIS was published in the Federal Register (Volume 71, Number 113). Notification of public meetings was accomplished through local media through the use of press releases, paid public notices and paid advertising. The public was also made aware of public meetings through postings on the Seashore's website and through its e-newsletter.

From the end of July through mid-December 2006, a series of 15 public scoping meetings were held to seek public input for the planning process. Of those 15 meetings, eight were organized as public open houses during which there were no formal presentations and planning team members were available to answer questions and accept comments. Poster boards describing the planning process and Fire Island National Seashore were available at each open house. Public comments could be made in writing on large format paper or submitted on individual comment cards. Two formal public scoping meetings were held in September 2006 – one at Mastic Beach and the other in Patchogue. These meetings offered a presentation providing an overview of the planning process and a formal opportunity to comment and ask questions.

The remaining five meetings were organized around specific stakeholder groups, including members of the Fire Island Association, seasonal community residents, the scientific community, environmental organizations, and other government agencies. At each session,

participants were also offered the opportunity to submit additional comments via U.S. post, electronic mail, or on the NPS Planning, Environment and Public Comment (PEPC) site. The formal public scoping period ended on January 12, 2007.

Foundation for Planning

As the name implies, the Foundation for Planning forms the underlying basis for the planning process and includes the park's purpose, significance, fundamental resources and values, and interpretive themes. The Foundation for Planning was developed during two workshops that were held in February and June 2007. The February 2007 workshop was internal and involved park staff and representatives from the Northeast Regional and Washington offices. It focused on the development of draft materials that would be shared at the second workshop. The June 2007 workshop involved key park partners in a wide-ranging discussion of the nature of partnership and the concept of cooperative stewardship. Participants also were invited to review and comment on the drafts of the Seashore's purpose and significance statements and its fundamental resources and values. Finally, in December 2007 a number of Seashore partners were assembled to participate in an Interpretive Themes workshop to identify the core concepts and messages to be conveyed by the Seashore.

The results of the public scoping process and the Foundation for Planning workshops provided the basis for GMP Newsletter #1, which was released to the public in winter 2008. The newsletter was mailed to approximately 5,500 households and organizations and was also made available on-line through the Seashore's website. The planning team received approximately 45 sets of comments related to this newsletter – most of which offered additional issues to be addressed by the GMP.

Fire Island National Seashore's Foundation for Planning may be found in Chapter One of this GMP.

Alternatives Development

The next phase of planning was dedicated to the development of preliminary alternatives. From January 2008 to February 2010, the planning team engaged in a number of workshops and briefings oriented toward different components of the plan. Workshops involved representation from Seashore staff, key stakeholders from both the public and private sector, consulting subject matter experts, and other NPS technical specialists. Workshops ranged in size from 20 to 42 participants; briefings reached anywhere between four and 30 participants. The topical areas addressed included:

- Visitor Experience and Transportation (January 2008)
- Sustainability (January 2008)
- Marine Resources (March 2008)
- William Floyd Estate (June 2009)
- Law Enforcement/ Public Safety (September 2009)
- Natural Resources (October 2009)
- Fire Island Wilderness (October 2009)
- Cultural Resources (January 2010)

Workshop participants examined many of the issues raised during the public scoping sessions and offered a wide variety of options for consideration. The input from these sessions greatly influenced the development of preliminary alternatives for Fire Island National Seashore.

In April 2010, GMP Newsletter #2 – Preliminary Alternatives was released for public review. A reprint of Newsletter #2 was released for a second distribution through the Fire Island News in August 2010 to ensure that the summer community of renters and day-trippers also had an opportunity to review the proposed alternatives and provide public comment. Nearly 10,000 copies of the newsletter were mailed or distributed through the Fire Island News. The newsletter was also available on-line at the Seashore's website.

Three public meetings were held in association with the release of Newsletter # 2. The first was a formal public meeting at the Seashore's Ferry Terminal in Patchogue in June 2010; an open house was held at the Fire Island Pines community center in August 2010; and finally, a formal public meeting was held at the Woodhull School on Fire Island in October 2010. Each of these meetings was well attended, with between 20 and 80 participants. The planning team also received approximately 300 sets of written comments.

The planning team continued developing and refining the management alternatives throughout 2011. In March 2011, a focus group session was convened to consider questions related to the current state of land-use and development regulations and shoreline management and to examine organizational models that could further cooperative stewardship. Also in March, a workshop devoted to refining management alternatives for the William Floyd Estate was held in Mastic Beach. In September 2011, GMP Newsletter # 3 was made available

and highlighted preliminary alternatives specific to the William Floyd Estate. Twelve sets of written comments were received in response.

Draft General Management Plan

The draft general management plan environmental impact statement is made available for public review for 90 days. During that time, the team will solicit public comment and hold public meetings that will be publicized in local media outlets. The NPS will review and evaluate all comments received on the draft GMP/EIS. The results of the public and agency comments will be incorporated into a final GMP/EIS that will be made available to the public for a 30-day no-action period, after which a Record of Decision may be prepared to document the selection of an alternative as the approved GMP for the Seashore.

A Wilderness Management Plan was approved in 1983. As part of the current GMP planning process, proposals for the Fire Island Wilderness are described in the Common to Action Alternatives section of Chapter Two and evaluated in Chapter Four. The Wilderness Management Plan, now referred to as a Wilderness Stewardship Plan (WSP), was updated to be consistent with the proposals in the GMP. The draft Wilderness Stewardship Plan that appears in Appendix D will undergo review concurrently with the draft GMP/EIS.

The draft and final GMP/EISs are programmatic statements presenting an overview of potential impacts relating to each management option. Once an alternative has been selected as the approved GMP, the implementation of specific actions may be subject to further compliance requirements.

Notifications and Formal Consultation

In September 2008 letters regarding the plan preparation were sent to Native American tribes historically associated with southern Long Island in general, and Fire Island and the William Floyd Estate in particular. The tribes contacted included the federally recognized Shinnecock Nation and the state-recognized Unkechaug Indian Nation. The Unkechaug Indian Nation has specific historical ties to the William Floyd Estate and the Floyd Family. Newsletters were also sent to tribes with this initial consultation letter in September 2008 and in April 2010. Representatives of the Unkechaug Indian Nation participated in the June 2009 and the March 2011 workshops regarding the William Floyd Estate.

Consultation with the U.S. Fish and Wildlife Service (USFWS) was initiated in December 2007 regarding the status of threatened and endangered species in the area. According to USFWS, there are five federally listed endangered, threatened, and candidate species that are known or are likely to occur in the Seashore. According to the New York State Department of Environmental Conservation (NYS DEC) website and New York Natural Heritage Program data, the project area contains rare plants and animals and significant natural communities. The NPS will continue consultation with USFWS and NYS DEC as site-specific plans are advanced to implement the general management plan.

COMPLIANCE WITH FEDERAL AND STATE LAWS AND REGULATIONS, POLICIES, AND MANDATES

As with all units of the National Park System, the management of the Fire Island National Seashore is guided by the 1916 Organic Act (which created the National Park Service); the General Authorities Act of 1970; the act of March 27, 1978 relating to the management of the National Park System; and other applicable federal laws and regulations, such as the Endangered Species Act and the National Historic Preservation Act. Actions are also guided by the National Park Service Management Policies 2006 and the Seashore's legislation (see Appendix A). The applicable laws, regulations, and policies most pertinent to the planning and management of the park are described below. Fire Island National Seashore will be managed in accordance with these laws and policies, regardless of which alternative is ultimately implemented.

Climate Change

A number of executive and departmental orders and National Park Service policies and strategies guide the agency's response to climate change. Executive Order 13653 entitled "Preparing the United States for the Impacts of Climate Change" calls for the "integration of climate science in policies and planning of government agencies." U.S. Department of the Interior (DOI) Secretarial Order No. 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources" establishes a DOI-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts on tribes and on the

land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages. The director of the National Park Service issued supplemental guidance applying NPS *Management Policies* (2006) in March 2012 and specific guidance relative the climate change considerations for cultural resources in 2013. The 2010 The National Park Service Climate Change Response Strategy articulates overarching goals and objectives to protect natural and cultural resources through four integrated components: science, adaptation, mitigation, and communication. NPS Climate Change Response Strategy, coupled with two implementation plans – the Climate Change Action Plan and the Green Parks Plan – put the federal directives for climate change adaptation and mitigation into practice.

Natural Resource Management Requirements

▸ AIR QUALITY/SCENIC VIEWS

The Clean Air Act (42 USC 7401 et seq.) requires federal land managers to protect air quality, and National Park Service *Management Policies* address the need to analyze air quality during park planning. States are responsible for the attainment and maintenance of national ambient air quality standards developed by the U.S. Environmental Protection Agency (EPA) for several pollutants: inhalable particulate matter, sulfur dioxide, nitrogen oxides, ozone, carbon monoxide, and lead. Elevated concentrations of these pollutants can have adverse impacts on park resources and visitors. Three air quality categories (I, II, and III) have been established for the national park system areas. The ambient air quality standard for the area covering Fire Island National Seashore is designated Class II, meaning that the state may permit a moderate amount of new air pollution, as long as neither ambient air quality standards nor the maximum allowable increases over established baseline concentrations are exceeded. Current laws and policies require that the air quality in the park meet national ambient air quality standards and that healthful indoor air quality at National Park Service facilities be ensured. Although the NPS has very little direct control over air quality in the air shed encompassing the parks, managers will cooperate with the State of New York, regional governments, and the EPA to monitor air quality and ensure that it is not impaired.

▸ COASTAL ZONE

New York State's Coastal Area has been divided into four geographic regions: Long Island, New York City, Hudson Valley, and Great Lakes. Fire Island National Seashore is situated in areas designated as Significant Coastal Fish and Wildlife Habitats within the Long Island coastal zone management area. All proposed activities for the sites must be consistent with the state's policies per the Coastal Zone Management Act of 1972, which is the primary federal statute for protecting the nation's coastal areas.

In accordance with the federal Coastal Zone Management Act of 1972, as amended, New York State passed the Coastal Erosion Hazard Area Act (Article 34 of NYS Environmental Conservation Law) in 1981. This state law regulates activities in areas designated as coastal erosion hazard areas. CEHA boundaries are depicted on maps prepared in accordance with the act. The entire Atlantic Ocean shoreline of New York is mapped as being within the hazard area, with different designations within the area called out for different management requirements. The landward boundary of the CEHA is referred to as the CEHA line; it was mapped for Fire Island in 1997, and implementation of the law on Fire Island began in 2001.

The act regulates construction, modification, restoration, or placement of a structure, as well as any action that materially alters the condition of the land, such as grading, excavation, and dredging. On Fire Island, CEHA is administered by the NYS DEC in the town of Islip, and separately by the villages of Saltaire and Ocean Beach, and by the town of Brookhaven, after having their local codes approved by DEC. CEHA permits are required by each administering agency for proposed projects within the CEHA area.

▸ SPECIES OF SPECIAL CONCERN

Laws and policies in effect for the protection of species of special concern include the Endangered Species Act of 1973 (as amended) and National Park Service policies on invasive species. Section 7 of the Endangered Species Act requires that when a project or proposal by a federal agency has the potential to affect a known candidate, threatened, or endangered plant or animal species, that agency must enter into formal consultation with the U.S. Fish and Wildlife Service. National Park Service management policies direct the NPS to give the same level of protection to state-listed species as to federally listed species. The laws and policies require that federally listed and state-listed threatened and endangered species and their habitats be sustained and that populations of native species that have been severely reduced in or extirpated from the park be restored where feasible and sustainable.

▸ WILDLAND FIRE

Laws and policies in effect regarding fire management require that all fires burning in natural or landscaped vegetation in parks be classified as either wildland fires or prescribed fires. Fire management is guided by Director's Orders 18: Wildland Fire Management and Reference Manual 18. All wildland fires are to be effectively managed, considering resource values to be protected and the safety of firefighters and the public, using the full range of strategic and tactical operations as described in the park's approved fire management plan. Prescribed fires are ignited by park managers to achieve resource objectives and are to include monitoring programs to determine whether specified objectives are met.

▸ WATER RESOURCES, FLOODPLAIN, AND WETLANDS

Laws and policies in effect for the protection of water resources include the Federal Water Pollution Control Act, as amended; the Clean Water Act of 1977; the Water Quality Act of 1987; Executive Order 11988: "Floodplain Management"; and Executive Order 11990: "Protection of Wetlands." Law and mandates require that: (1) surface water and groundwater be restored or enhanced; (2) National Park Service and National Park Service–permitted programs and facilities be maintained and operated to avoid pollution of surface water and groundwater; (3) natural floodplain values be preserved or restored; (4) the natural and beneficial values of wetlands be preserved and enhanced; and (5) long-term and short-term environmental effects associated with the occupancy and modification of floodplain be avoided.

Cultural Resource Management Requirements

Cultural resource management activities are guided by National Park Service *Management Policies* 2006 and Director's Order 28: the National Park Service Cultural Resource Management Guideline. Laws and policies in effect for the protection of cultural resources include: the Antiquities Act of 1906; the National Historic Preservation Act of 1966, as amended; Executive Order 11593 – "Protection and Enhancement of the Cultural environment;" the Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (2008); and the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

▸ CULTURAL LANDSCAPES

In addition to those listed above, laws and policies in effect for the protection of cultural landscapes include the *Secretary of the Interior's Standards for Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes*. Law and policies require that cultural landscapes inventories be conducted to identify landscapes potentially eligible for listing in the National Register of Historic Places and to assist in future management decisions for landscapes and associated resources, both cultural and natural. The management of cultural landscapes focuses on preserving the landscape's physical attributes, biotic systems, and use when they contribute to its historical significance.

▸ HISTORIC STRUCTURES

In addition to those listed above, laws and policies in effect for the protection of historic structures include the Historic Sites, Buildings, and Antiquities Act of 1935, as amended. Law and policies require that historic structures be inventoried and their significance and integrity evaluated under National Register criteria. The qualities that contribute to the listing or eligibility for listing of historic properties on the National Register of Historic Places are to be protected in accordance with the Secretary of the Interior's Standards, unless it is determined through a formal process that disturbance or natural deterioration is unavoidable.

ARCHEOLOGICAL RESOURCES

In addition to those listed above, laws and policies in effect for the protection of archeological resources include: Director's Order 28A: Archeology; the Archeological and Historic Preservation Act of 1974, as amended; the Archaeological Resources Protection Act of 1979, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*. Law and policies require that archeological sites be identified and inventoried and their significance determined and documented.

MUSEUM COLLECTIONS AND ARCHIVES

In addition to those listed above, laws and policies in effect for the protection of museum collections and archives include: the National Park Service *Museum Handbook* and the Museum Properties Management Act of 1955, as amended. Law and policies require that all museum collections (objects, specimens, and manuscript collections) be identified, inventoried, catalogued, documented, preserved, and protected; and provision is made for their access and use for exhibits, research, and interpretation. The qualities that contribute to the significance of the collections are protected in accordance with established standards.

ETHNOGRAPHIC RESOURCES

Certain contemporary American Indian and other communities are permitted by law, regulation, or policy to pursue customary religious, subsistence, and other cultural uses of National Park Service resources with which they are traditionally associated. To the extent permitted by law, the National Park Service will take care to protect resources in a way that will accommodate their religious value. All agencies, including the National Park Service, are required to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and to avoid adversely affecting the physical integrity of these sacred sites. Other federal agencies, state and local governments, potentially affected American Indian and other communities, interested groups, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation are to be given opportunities to become informed about and comment on anticipated NPS actions at the earliest practicable time. All agencies are required to consult with tribal governments before taking actions that affect federally recognized tribal governments.

Park Operations Requirements

ACCESSIBILITY

Section 504 of the Rehabilitation Act of 1973 and federal guidelines published in accordance with the Americans with Disabilities Act of 1990 define specific access requirements for persons with disabilities to parking facilities, pathways, and buildings. The accessibility requirements apply to government facilities (Title II) and to private entities that provide public accommodations (Title III). Accordingly, park managers are to strive to ensure that disabled persons are afforded the same experiences and opportunities enjoyed by other visitors to the greatest extent practicable. Special, separate, or alternative facilities, programs, or services are to be provided only when existing ones cannot reasonably be made accessible.

RIGHTS-OF-WAY AND TELECOMMUNICATION INFRASTRUCTURE

The Telecommunications Act of 1996 directs all federal agencies to assist in the national goal of achieving a seamless telecommunications system throughout the United States by accommodating requests by telecommunication companies for the use of property, rights-of-way, and easements to the extent allowable under each agency's mission. The National Park Service is legally obligated to permit telecommunication infrastructure in the parks if such facilities can be structured to avoid interference with park purposes. Law and policies also require that park resources and/or public enjoyment of the park not be denigrated by nonconforming uses. Telecommunication structures are to be permitted in the park to the extent that they do not jeopardize the park's mission and resources.

SUSTAINABLE DESIGN/DEVELOPMENT

Sustainability can be described as the result of managing units of the National Park System in ways that do not compromise the environment or its capacity to provide for present and future generations. Federal laws, executive orders, and executive memoranda, direct the National Park Service's policies and strategies related to sustainability. They include Executive Order 13123: "Greening the Government through Efficient Energy Management;" Executive Order 13101: "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition;" and the National Park Service *Guiding Principles of Sustainable Design*. Principles have

been developed and are followed for interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. The National Park Service strives to reduce energy costs, eliminate waste, and conserve energy resources by using energy-efficient and cost-effective technology. Park managers also strive to incorporate energy efficiency into the decision-making process during the design and acquisition of buildings, facilities, and transportation systems, emphasizing the use of renewable energy sources.

Socioeconomic Requirements

▸ ENVIRONMENTAL JUSTICE

Executive Order 12898: "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires federal agencies to consider the impact of their actions on minority and low-income populations and communities, as well as the equity of the distribution of benefits and risks of those actions.

SECTION 106 COMPLIANCE REQUIREMENTS FOR UNDERTAKINGS

Section 106 of the National Historic Preservation Act requires that federal agencies with direct or indirect jurisdiction take into account the effect of undertakings on National Register listed or eligible properties and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Section 106 consultation with the New York State Historic Preservation Office (SHPO) was initiated via formal correspondence in November 2007 followed by newsletter mailings in February 2008 (Progress Report), April 2010 (Preliminary Alternatives), and September 2011 (William Floyd Estate alternatives). In January 2010, representatives of the NY SHPO toured areas of Fire Island and participated in a cultural resource management workshop to consider issues and opportunities associated with the identification, protection, and interpretation of cultural resources across the island. As implementation of the GMP proceeds, the NPS will continue to fulfill its responsibilities under Section 106 for actions that have the potential to affect historic properties by following the process and requirements in 36 CFR 800 and the November 2008 Programmatic Agreement among the National Conference of State Historic Preservation Officers, the Advisory Council on Historic Preservation, and the National Park Service (Department of the Interior) on a site-specific basis.

The following table identifies future actions under the preferred alternative that would likely require review under Section 106 of the National Historic Preservation Act and under the Programmatic Agreement.

TABLE 5-1: SUMMARY OF ACTIONS REQUIRING REVIEW UNDER SECTION 106

Standard Review Process under Section IV of 2008 Programmatic Agreement
Construct addition for Curatorial Storage Facility
Install solar shade structure over some or all of the Ferry Terminal Parking area
Construct sheltered group program space at Sailors Haven
Rehabilitate and adaptively reuse Carrington House and Cottage for administrative purposes
Rehabilitate the cultural landscape at the William Floyd Estate
Introduce landscape vignettes at the William Floyd Estate
Rehabilitate and expand existing visitor service facilities at the Floyd Estate
Rehabilitate and expand existing maintenance structure at the Floyd Estate
Streamlined Activities under Section III.C of 2008 Programmatic Agreement
Improve universal access to structures, grounds, and facilities
Update or expand interpretive waysides at Fire Island Light
Complete stabilization of the Old Mastic House at the William Floyd Estate

List of Draft General Management Plan Recipients *(Agencies, Organizations & Institutions)*

Appalachian Mountain Club
Atlantique Property Owners Association
Babylon (town)
Bay Shore Historical Society
Bellport (village)
Bellport-Brookhaven Historical Society
Blue Point Company
Brookhaven Baymen's Association
Brookhaven (town)
Chamber of Commerce of the Mastics-Moriches-Shirley, Inc.
Cherry Grove Community Association
Cherry Grove Property Owners Association
Coastal Research and Education Society of LI, Inc.
Corneille Estates Association
Davis Park Association
Dowling College
Dunewood Property Owners Association
Earth Island Institute
Environmental Defense Fund
Fair Harbor Association
Fire Island Association
Fire Island Fire Chiefs Council
Fire Island Law Enforcement and Safety Council
Fire Island Lighthouse Preservation Society
Fire Island Pines Property Owners Association
Fire Island Wilderness Committee
Fire Island Year Round Residents Association
Four Harbors Audubon Society
Greater Patchogue Historical Society
Great South Bay Audubon Society
Great South Bay Restoration Alliance
Greater Patchogue Chamber of Commerce
Group for the East End
Islip (town)
Kismet Community Association
Lonelyville Property Owners Association
Lonelyville Tax Payers Association
Long Island Association
Long Island Beach Buggy Association
LI Convention and Visitors Bureau
Long Island Paddlers
Long Island Power Authority
Long Island Regional Planning Board
Long Island Shorefront Defense Committee
Long Island Sierra Club
Long Island State Parks and Recreation Commission
Long Island Studies Institute at Hofstra University
Long Island Traditions, Inc.
Mastic Beach (village)
Mastic Beach Property Owners Association
Moriches Bay Historical Society
Nassau Hiking & Outdoor Club
National Audubon Society
National Marine Fisheries Service
National Parks & Conservation Association
Natural Resources Defense Council
Natural Trails and Waters Coalition
New York League of Conservation Voters
New York Marine Trades Association
New York New Jersey Trail Conference
NYS Department of Environmental Conservation (DEC)
NYS Department of State – Coastal Resources Division
NYS Department of State – South Shore Estuary Reserve
NYS Office of Parks, Recreation & Historic Preservation (OPRHP)
New York Sport Fishing Federation
NY State Historic Preservation Office (SHPO)
Ocean Bay Park Association
Ocean Beach Historical Society
Ocean Beach (village)
Ocean Beach Association

Parks and Trails New York
Patchogue (village)
Pattersquash Duck Club
Point O' Woods Association
Point O' Woods Historical Society
Post-Morrow Foundation, Inc.
Preservation League of New York
Robbins Rest Association
Saltaire (village)
Saltaire Citizen's Advisory Association
Sayville Ferry Service
Sayville Historical Society
Seatuck Environmental Association
Seaview Association
Shinnecock Nation (federally-recog.)
Sierra Club, Long Island Group
Smith Point County Park
Society for the Preservation of Long Island Antiquities (SPLIA)
South Shore Audubon
South Shore Estuary Reserve
Stony Brook University
Suffolk County Archeological Society
Suffolk County Historical Society
Suffolk County – Executive Offices
Suffolk County – Parks Department
Suffolk County – Planning Department
Summer Club Condominium
Unkechaug Nation at Poospatuck Reservation (state-recog)
United Four Wheel Drive Association
United Mobile Sportfishermen, Inc.
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency (EPA)
U.S. Geological Survey (USGS)
Water Island Association
William Floyd School District

List of Preparers, Partners, Consultants & Advisers

TEAM MEMBERS

Northeast Region

Ellen Carlson, Project Manager
Natalya Apostolou, Cartographer/GIS Specialist
Robin Lepore, Coastal Management Specialist (retired)
Patricia Rafferty, Coastal Ecologist

Fire Island National Seashore

K. Christopher Soller, Superintendent
Diane Abell, Landscape Architect/ Park Planner (retired)
Michael Bilecki, Chief of Resource Management
Lena Boesser-Koschmann, Chief Ranger (former)
Paul Czachor, Supervisory Park Ranger (retired)
Steven Czarniecki, Chief of Cultural Resources (retired)
James Dunphy, Chief of Facilities Management
Roger Huguenin, Administrative Officer (retired)
Kathy Krause, Chief of Interpretation
Jay Lippert, Chief Ranger (retired)
Sean McGuinness, Former Deputy Superintendent (retired)
Chris Olijnk, Site Manager, William Floyd Estate
Jen Panko, Administrative Officer (retired)
Michael Reynolds, Former Superintendent
Paula Valentine, Public Information Specialist (retired)

Consultants

Shapins Belt Collins
Ann Moss, Landscape Architect (Principal)
Thomas Gibney, Landscape Architect
Justin Atherton-Wood, Landscape Architect
Kathryne Hoogerwerf, Landscape Designer/ Graphic Artist

Vanasse Hangen Brustlin, Inc

Laura Castelli, Transportation Engineer

Tim Davis, PWS, Senior Environmental Scientist

Chris Frye, Senior Environmental Scientist

Scott Smizik, Environmental Planner

Kimberly Threlfall, Environmental Scientist

Rita Walsh, Senior Preservation Planner

Carol Weed, Senior Archeologist

Tricia Wingard, Project Manager

Others

Larry Lowenthal, Consulting Historian and Planner

Marjorie Smith, Consulting Planner

National Park Service Reviewers & Advisers

NORTHEAST REGION

Mark Alexander, PChief, NER Line Item Construction and Transportation Branch

Karl Beard, NYS Director, NER Rivers, Trails and Conservation Assistance

Michael Caldwell, Regional Director

Dave Clark, Environmental Compliance (retired)

Delia Clark, Community Engagement, NPS Conservation Study Institute

Sheila Colwell, Wildlife Biologist

David O. Conover, CESU SUNY Stony Brook

Allen Cooper, Chief of Park Planning and Special Studies

Richard Crisson, Historical Architect (retired)

Tom Dyer, Chief, Cultural Resources (retired)

Mary Foley, Chief Scientist (retired)

Robert Fudge, Chief of Interpretation and Education (retired)

Howard S. Ginsberg, CESU USGS-Patuxent Unit

William Griswold, Archeologist

John W. Hammond, Historical Landscape Architect, Olmsted Center for Landscape Preservation

Elizabeth Hoermann, Education Specialist (retired)

Louis Hutchins, Regional Historian (former)

Elizabeth Igleheart, National Register Coordinator (retired)

Jacquelyn Katzmire, Regional Environmental Coordinator

Robert Kirby, Superintendent, Gettysburg National Military Park (retired)

Megan Lang, Community Planner

Robert W. McIntosh, Associate Regional Director, Planning, Construction, and Facility Management (retired)

Nora Mitchell, Executive Director, NPS Conservation Study Institute (retired)

Terrence Moore, Chief, Park Planning & Special Studies (retired)

Bob Page, Chief, Olmsted Center for Landscape Preservation

John Piltzecker, Associate Regional Director, Planning, Facilities & Conservation Assistance (former)

Barbara Pollerine, Chief of Interpretation & Education

Dennis R. Reidenbach, Regional Director (former/ retired)

Charles T. Roman, Research Coordinator North Atlantic Coast

Chuck Smythe, Northeast Region: Regional Ethnographer (former)

Brian Strack, Associate Regional Director, Planning, Facilities & Conservation Assistance

H. Brian Underwood, CESU USGS-Patuxent Unit

Peggy Albee Vance, Program Manager, Historic Architecture (retired)

Gay Vietzke, Deputy Director for Operations

Paul Weinbaum, Regional Historian (retired)

Fire Island National Seashore

Jason Flynn, Park Ranger

Steve Henderson, Park Interpreter (retired)

Kaetlyn Kerr, Biology Technician

Mary Laura Lamont, Park Interpreter

John Mahoney, Special Park Uses Coordinator

Walt Martens, Maintenance Foreman

Jordan Raphael, Biologist

Lindsay Ries, Wildlife Biologist

Elizabeth Rogers, Park Interpreter

Irene Rosen, Park Interpreter

Kristen Santos, Park Interpreter

Denise Steinmacher, Park Interpreter

John Stewart, Deputy Chief Ranger

Jon Swindle, Law Enforcement Ranger

Assateague Island National Seashore

Rick Barrett, Facility Manager (retired)

Ish Ennis, Maintenance Mechanic Supervisor (retired)

Governors Island National Monument

Patti Reilly, Superintendent

Lowell National Historical Park

Celeste Bernardo, Superintendent

Washington Office

Karl Brookins. NPS Water Resources Division/ Ocean and Coastal Resources Branch

Jeffrey Cross, NPS Water Resources Division/ Ocean and Coastal Resources Branch

Beth Johnson, Deputy Associate Director, NRSS (retired)

Cliff McCreedy, Marine Management Specialist

Shawn Norton, NPS Environmental Leadership Coordinator

Gary Oye, National Wilderness Program Manager (former)

Rick Potts, National Wilderness Program Manager (former)

Julia Washburn, NPS Education Council

Denver Service Center

Ron Treants, Project Specialist/ Architect

PARTNERS, CONSULTANTS, AND OTHER SPECIALISTS

Partners

Davis Park Ferry Company

Eastern National

Fire Island Association

Fire Island Ferries

Fire Island Lighthouse Preservation Society

Fire Island Wilderness Committee

Fire Island Year Round Residents

Friends of Fire Island National Seashore

Friends of Watch Hill

Robert Moses State Park

Sayville Ferry Service

South Shore Estuary Program

Suffolk County, New York

Town of Brookhaven, New York

Town of Islip, New York

Consultants & Other Specialists

Anita Barberis, Appalachian Mountain Club

Bill Bobenhausen, FAIA, Sustainable Design Collaborative

Pam Boyle, Friends of Watch Hill

Alexander Brash, National Parks & Conservation Association/ Northeast Region

Paul M. Bray, PM Bray LLC

Wally Broege, Suffolk County Historical Society

Gordon Brosdal, William Floyd School District

Tom Carrano, Town of Brookhaven, Division of Environmental Protection

Paul Casciano, William Floyd School District

Frank Castelli, Suffolk County, Division of Water Quality Protection & Restoration

Paul Cataldo, LEED AP, US Green Building Council, LI Chapter

William Chaleff, Chaleff & Rogers Architects

Karen Chytalo, NYS DEC, Marine Habitat Protection

Janet Clark, Long Island Convention & Visitor Bureau

Kathy Curran, Suffolk County Historical Society

Mike Deering, Long Island Power Authority

Ed DeGennaro, Mastic Peninsula Historical Society

Michael Dyer, John A. Volpe Transportation Systems Center, US DOT

Mike Eagan, South Bay Paddle Wheel Cruises

Greg Edinger, Program Ecologist, New York Natural Heritage Program, NYS DEC

Jeff Fulmer, South Shore Estuary Reserve (formerly)

Dennis Gartland, Robert Moses State Park

David Genaway, Town of Islip, Planning Department

Teri Germano, Mastic-Moriches-Shirley Community Library (retired)

Dave Griese, Fire Island Lighthouse Preservation Society

Bill Hamilton, Brookhaven Baymen's Association

Dave Henson, DVM, Friends of Fire Island National Seashore

Steve Hess, Las Virgenes Homeowners Association (SAMO)

George Hoag, Friends of Fire Island National Seashore

Jeff Kassner, Town of Brookhaven, Division of Environmental Protection

Luke Kaufman, Fire Island Ferries

Bob LaRosa, Fire Island Lighthouse Preservation Society

Diane Larsen, Long Island Railroad

Carl LoBue, The Nature Conservancy

Mike Lubrano, Mastic Peninsula Historical Society

Joseph Maiorana, Mastic-Moriches-Shirley Community Library

Elizabeth Martin, NY SHPO – Historic Preservation Assistance

Kevin McAllister, Peconic Bay Keepers

Warren McDowell, Fire Island Tide

Robert McKay, Society for the Preservation of Long Island Antiquities

Mel Morris, Brookhaven National Laboratory

Anton Nelessen, A Nelessen Associates, Inc.

Sara Newkirk, The Nature Conservancy (formerly)

Charles Norris, Norris & Norris Associates

Elyse O'Brien, Suffolk County, Department of Environment and Energy

Elizabeth O'Connor, Sea Kayaking Skills & Adventures

Haley Peckett, John A. Volpe Transportation Systems Center, US DOT

Mark Peckham, NY SHPO

Paul Pontieri, Village of Patchogue

Paul Rogalle, Town of Brookhaven, Planning Department

Derek Rogers, Smith Point County Park

Kerri Rosalia, Mastic-Moriches-Shirley Community Library

Barbara Russell, Town Historian, Town of Brookhaven

Tamara Sadoo, Suffolk County, Division of Water Quality Protection & Restoration

Patricia E. Salkin, Touro College Jacob D. Fuchsberg Law Center

Douglas Schmid, Western Suffolk County BOCES

Cornelia Schlenk, NY Sea Grant

Eileen Schwinn, Eastern Long Island Audubon Society

Bertram E. Seides, The Ketcham Inn Foundation, Inc.

Matthew Sherman, Davis Park Ferry Company

Charles L. Siemon, Siemon and Larsen, P.A.,

Lou Siegel, South Shore Estuary Program

Woody Smeck, Superintendent, Santa Monica Mountains NRA

Mark Smothergill, Mastic-Moriches-Shirley Chamber of Commerce

Nancy Solomon, Long Island Traditions

Ken Stein, Fire Island Concessions/ Sayville Ferry Service

Gerry Stoddard, Fire Island Association

Dr. John Strong, Long Island University (Emeritus)

James Tripp, Environmental Defense Fund

Frank Turano, SUNY/ Stony Brook

Peggy Unger, Western Suffolk County BOCES

Beth Wahl, William Floyd Community Summit

Chief Harry Wallace, Unkechaug Nation

Michelle Williams, USFWS – Long Island Complex (Wertheim NWR)

Tom Williams, Cornell Cooperative Extension

Susan Wischhusen, Mastic-Moriches-Shirley Rotary Club

Alexandra Wolfe, Society for the Preservation of Long Island Antiquities

Joe Zysman, Fire Island Wilderness Committee

Community Representatives

Joseph (Harry) Baker, Village of Saltaire

Susan Barbash, Dunewood

Walter Boss, Fire Island Pines

Thomas Chorba, Atlantique

Forrest Clock, Lonelyville

Frank Cuneo, Fair Harbor

Bob DeBona, Mastic Beach Property Owners Association

Amanda Fabian, Fair Harbor

Jerry Feder, Fair Harbor

Erica Fried, Fair Harbor

Kevin Gillespie, Fire Island Year Round Residents

Suzy Goldhirsch, Seaview (President, Fire Island Assoc)

Scott Hirsch, Island Mermaid, Ocean Beach

Bartley Horton, Ocean Bay Park

Jerry Jerome, Dunewood

Irving Like, Fire Island Association

Joe Loeffler, Ocean Beach

John Lund, Davis Park

Justin McCarthy, Point O Woods

Mario Posillico, Village of Saltaire

Natalie Rogers, Ocean Beach

Claire Siegel, Blue Point Beach

Bob Spencer, Davis Park

Bea Thornberg, Fair Harbor

Eric von Kuersteiner, Pines Commercial Properties, Fire Island Pines

APPENDIX A: Legislative History

LEGISLATIVE HISTORY OF
FIRE ISLAND
NATIONAL SEASHORE

INCLUDING:

PUBLIC LAW 88-587 (All) FIIS Enabling Legislation (1964)
PUBLIC LAW 89-244 (All) William Floyd Estate (1965)
PUBLIC LAW 94-578 (Part) Increase Appropriations (1976)

PUBLIC LAW 95-625 (Part) Boundary Changes & Dune District (1978)
PUBLIC LAW 96-585 (All) High Dune Wilderness Designation (1980)
PUBLIC LAW 98-482 (All) FIIS Land Acquisition (1984)

FIRE ISLAND
NATIONAL SEASHORE
120 Laurel Street
Patchogue, N.Y. 11772
(516) 289-4810

PUBLIC LAW 88-587
88th Congress
September 11, 1964

AN ACT

TO ESTABLISH THE FIRE ISLAND NATIONAL SEASHORE, AND FOR OTHER PURPOSES

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That

Fire Island National Seashore Establishment

(a) for the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features within Suffolk County, New York, which possess high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban population, the Secretary of the Interior is authorized to establish an area to be known as the "Fire Island National Seashore".

Boundaries

(b) The boundaries of the national seashore shall extend from the easterly boundary of Robert Moses State Park eastward to Moriches Inlet and shall include not only Fire Island proper, but also such islands and marshlands in the Great South Bay, Bellport Bay, and Moriches Bay adjacent to Fire Island as Sexton Island, West Island, Hollins Island, Ridge Island, Pelican Island, Pattersquash Island, and Reeves Island and such other small and adjacent islands, marshlands, and wet lands as would lend themselves to contiguity and reasonable administration within the national seashore and, in addition, the waters surrounding said area to distances of one thousand feet in the Atlantic Ocean and up to four thousand feet in Great South Bay and Moriches Bay, all as delineated on a map identified as "Fire Island National Seashore No. OGP-0002", dated June 1964. The Secretary shall file said map with the Federal Register, and it may also be examined in the offices of the Department of the Interior.

SECTION 2

Acquisition of land.
78 Stat. 928
78 Stat. 929

(a) The Secretary is authorized to acquire, and it is the intent of Congress that he shall acquire as appropriated funds become available for the purpose or as such acquisition can be accomplished by donation or with donated funds or by transfer, exchange, or otherwise, the lands, waters, and other property, and improvements thereon and any interest therein, within the boundaries of the seashore as established under Section 1 of this Act. Any property or interest therein owned by the State of New York, by Suffolk County, or by any other political subdivision of said State may be acquired only with the concurrence of such owner. Notwithstanding any other provision of law, any Federal property located within such area may, with the concurrence of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for use by him in carrying out the provisions of the Act. In exercising his authority to acquire property in accordance with the provisions of the subsection, the Secretary may enter into contracts requiring the expenditure, when appropriated, of funds authorized by the Act, but the liability of the United States under any such contract shall be contingent on the appropriation of funds sufficient to fulfill the obligations thereby incurrent.

Publication in Federal Register

(b) When the Secretary determines that lands and waters or interests therein have been acquired by the United States in sufficient quantity to provide an administrative unit, he shall declare the establishment of the Fire Island National Seashore by publication of notice in the Federal Register.

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SECTION 2 (continued)

(c) The Secretary shall pay not more than the fair market value, as determined by him, for any land or interest therein acquired by purchase.

(d) When acquiring land by exchange the Secretary may accept title to any nonfederally owned land located within the boundaries of the national seashore and convey to the grantor any federally owned land under the jurisdiction of the Secretary. The lands so exchanged shall be approximately equal in fair market value, but the Secretary may accept cash from or pay cash to the grantor in order to equalize the values of the lands exchanged.

(e) With one exception the Secretary shall not acquire any privately owned improved property or interests therein within the boundaries of the seashore or any property or interests therein within the communities delineated on the boundary map mentioned in Section 1, except beach or waters and adjoining land within such communities which the Secretary determines are needed for public access to the beach, without the consent of the owners so long as the appropriate local zoning agency shall have in force and applicable to such property a duly adopted, valid, zoning ordinance that is satisfactory to the Secretary. The sole exception to this limitation on the power of the Secretary to condemn improved property where appropriate zoning ordinances exists shall be in the approximately eight-mile area from the easterly boundary of the Brookhaven town park at Davis Park, in the town of Brookhaven, to the westerly boundary of the Smith Point County Park. In this area only, when the Secretary deems it advisable for carrying out the purposes of this Act or to improve the contiguity of the park land and ease its administration, the Secretary may acquire any land or improvements therein by condemnation. In every case in which the Secretary exercises this right of condemnation of improved property the beneficial owner or owners (not being a corporation) of any improved property so condemned, proved he, she, or they held the same or a greater estate in the property on July 1, 1963, may elect as a condition of such acquisition by the Secretary any one of the following three alternatives:

78 Stat. 929
78 Stat. 930

(1) that the Secretary shall take the said property in fee simple absolute and pay the fair market value thereof as of the date of such taking;

(2) that the owner or owners shall retail a life estate in said property, measured on the life of the sole owner or on the life of any one person among multiple owners (notice of the person so designated to be filed in writing with the Secretary within six months after the taking) or on the life of the survivor in title of any estate held on July 1, 1963, as a tenancy by the entirety. The price in such case shall be diminished by the actuarial methods;

(3) that the owner or owners shall retain an estate for twenty-five years. The price in this case shall likewise be diminished by the value of the estate retained.

"Improved property"

(f) The term "improved property" as used in this Act shall mean any building, the construction of which was begun before July 1, 1963, and such amount of land, not in excess of two acres in the case of a residence or ten acres in the case of a commercial or industrial use, on which the building is situated as the Secretary considers reasonably necessary to the use of the building: *Provided*, That the Secretary may exclude from improved properties any beach or waters, together with so much of the land adjoining such beach or waters, as he deems necessary for public access thereto.

Regulations

SECTION 3

(a) In order to carry out the provisions of section 2, the Secretary shall issue regulations, which may be amended from time to time, specifying standards that are consistent with the purposes of this Act for zoning ordinances which must meet his approval.

(b) The standards specified in such regulations shall have the object of (1) prohibiting

SECTION 3 (continued)

new commercial or industrial uses, other than commercial or industrial uses which the Secretary considers are consistent with the purpose of this Act, of all property within the national seashore, and (2) promoting the protection and development for purposes of the Act of the land within the national seashore by means of acreage, frontage, and setback requirements.

(c) Following issuance of such regulations the Secretary shall approve any zoning ordinance or any amendment to any approved zoning ordinance submitted to him that conforms to the standards contained in the regulations in effect at the time of adoption of the ordinance or amendment. Such approval shall remain effective for so long as such ordinance or amendment remains in effect as approved.

(d) No zoning ordinance or amendment thereof shall be approved by the Secretary which (1) contains any provisions that he considers adverse to the protection and development, in accordance with the purposes of this Act, of the area comprising the national seashore; or (2) fails to have the effect of providing that the Secretary shall receive notice of any variance granted under, or any exception made to, the application such ordinance or amendment.

(e) If any improved property, with respect to which the Secretary's authority to acquire by condemnation has been suspended according to the provisions of this Act, is made the subject of a variance under, or becomes for any reason an exception to, such zoning ordinance, or is subject to any variance, exception, or use that fails to conform to any applicable effect at the time of passage of such ordinance, the suspension of the Secretary's authority to acquire such improved property by condemnation shall automatically cease.

(f) The Secretary shall furnish to any party in interest upon request a certificate indicating the property with respect to which the Secretary's authority to aquire by condemnation is suspended.

78 Stat. 930
78 Stat. 931

SECTION 4

Owners Use of Property

(a) Owners of improved property acquired by the Secretary may reserve for themselves and their successors or assigns a right of use and occupancy of the improved property for noncommercial residential purposes for a term that is not more than twenty-five years. The value of the reserved right shall be deducted from the fair market value paid for the property.

(b) A right of use and occupancy reserved pursuant to this section shall be subject to termination by the Secretary upon his determination that the use and occupancy is not consistent with an applicable zoning ordinance approved by the Secretary in accordance with the provisions of Section 3 of this Act, and upon tender to the owner of the right an amount equal to the fair market value of that portion of the right which remains unexpired on the date of termination.

SECTION 5

Hunting and Fishing

The Secretary shall permit hunting, fishing, and shell-fishing on lands and waters under his administrative jurisdiction within the Fire Island National Seashore in accordance with the laws of New York and the United States of America, except that the Secretary may designate zones where, and establish periods when, no hunting shall be permitted for reasons of public safety, administration, or public use and enjoyment. Any regulations of the Secretary under this Section shall be issued after consultation with the Conservation Department of the State of New York.

SECTION 6

The Secretary may accept and use for purposes of this Act any real or personal property of moneys that may be donated for such purposes.

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Sunken Forest Preserve

SECTION 7

(a) The Secretary shall administer and protect the Fire Island National Seashore with the primary aim of conserving the natural resources located there. The area known as the Sunken Forest Preserve shall be preserved from bay to ocean in as nearly its present state as possible, without developing roads therein, but continuing the present access by those trails already existing and limiting new access to similar trails limited in number to those necessary to allow visitors to explore and appreciate this section of the seashore.

(b) Access to that section of the seashore lying between the easterly boundary of the Brookhaven town park at Davis Park and the westerly boundary of the Smith Point County Park shall be provided by ferries and footpaths only, and no roads shall be constructed in this section except such minimum roads as may be necessary for park maintenance vehicles. No development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the flora and fauna or the physiographic conditions now prevailing, and every effort shall be exerted to maintain and preserve this section of the seashore as well as that set forth in the preceding paragraph in as nearly their present state and condition as possible.

(c) In administering, protecting, and developing the entire Fire Island National Seashore, the Secretary shall be guided by the provisions of this Act and the applicable provisions of the laws relating to the national park system, and the secretary may utilize any other statutory authority available to him for the conservation and development of natural resources to the extent he finds that such authority will further the purposes of this Act. Appropriate user fees may be collected notwithstanding any limitation on such authority by any provision of law.

Shore erosion control
78 Stat. 931
78 Stat. 932

SECTION 8

(a) The authority of the Chief of Engineers, Department of the Army, to undertake or contribute to shore erosion control or beach protection measures on lands within the Fire Island National Seashore shall be exercised in accordance with a plan that is mutually acceptable to the Secretary of the Interior and the Secretary of the Army and that is consistent with the purposes of this Act.

(b) The Secretary shall also contribute the necessary land which may be required at any future date for the construction of the new inlet across Fire Island in such location as may be feasible in accordance with plans for such an inlet which are mutually acceptable to the Secretary of the interior and the Secretary of the Army and that is consistent with the purposes of this Act.

Fire Island National Advisory Comission Establishment

SECTION 9

(a) There is hereby established a Fire Island National Seashore Advisory Commission (hereinafter referred to as the Commission). The Commission shall terminate on the tenth anniversary of the date of this Act or on the declaration, pursuant to Section 2 (b) of this Act, of the establishment of the Fire Island National Seashore, whichever occurs first. The Commission shall consist of fifteen members, each appointed for a term of two years by the Secretary, as follows:

(1) Ten members to be appointed from recommendations made by each of the town boards of Suffolk County, New York, one member from the recommendations made by each such board;

(2) Two additional members to be appointed from recommendations of the town boards of the towns of Islip and Brookhaven, Suffolk County, New York;

(3) One member to be appointed from the recommendation of the county executive of Suffolk County, New York;

(4) One member to be designated by the Secretary.

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SECTION 9 (continued)

(b) The Secretary shall designate one member to be Chairman.
(c) A member of the Commission shall serve without compensation.
(d) The Commission established by this section shall act and advise by affirmative vote of a majority of the members thereof.
(e) The Secretary or his designee shall, from time to time, consult with the members of the Commission with respect to matters relating to the development of Fire Island National Seashore and shall consult with the members with respect to carrying out the provisions of Sections 2, 3, and 4 of this Act.
(f) (1) Any member of the Advisory Commission appointed under this Act shall be exempted, with respect to such appointment from the operation of Sections 281, 283, 284, and 1914 of title 18 of the United States Code and Section 190 of the Revised Statutes (5 U.S.C. 99) except as otherwise specified in paragraph (2) of this subsection.

Conflict of interest

76 Stat. 1126

(2) The exemption granted by paragraph (1) of this subsection shall not extend--

(i) to the receipt of payment of salary in connection with the appointee's Government service from any sources other than the private employer of the appointee at the time of his appointment; or
(ii) during the period of such appointment, and the further period of two years after the termination thereof, to the prosecution or participation in the prosecution, by any person so appointed, of any claim against the Governmernt involving any matter concerning which the appointee had any responsibility arising out of his appointment during the period of such appointment.

78 Stat. 932
78 Stat. 933

SECTION 10

There is hereby authorized to be appropriated not more than $16,000,000 for the acquisition of lands and interests in land pursuant to this Act.

Appropriation

APPROVED SEPTEMBER 11, 1964.

PUBLIC LAW 89-244
89th Congress
October 9, 1965

October 9, 1965 (H. R. 8035)

AN ACT

To authorize the Secretary of the Interior to accept a donation of property in the county of Suffolk, State of New York, known as the William Floyd Estate, for addition to the Fire Island National Seashore, and for other purposes.

Fire Island National Seashore, N.Y. Additional land 78 Stat. 928

Filing with Federal Register

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized to accept the donation of approximately six hundred and eleven acres of lands, submerged lands, islands, and marshlands or interests therein, known as the William Floyd Estate, located in the town of Brookhaven, country of Suffolk, and State of New York, delineated on a certain map entitled "Map of the Fire Island National Seashore, Including the William Floyd Estate", numbered OGP-0003, dated May 1965, which map or a true copy thereof shall be filed with the Federal Register and may be examined in the offices of the Department of the Interior. Such donations may be accepted subject to such terms, covenants, and conditions as the Secretary finds will be in the public interest.

Lease of lands, dwellings, etc.

SECTION 2

The Secretary is also authorized to accept the donation of the main dwelling on said lands, which was the birthplace and residence of General William Floyd (a signer of the Declaration of Independence) and the furnishings therein and any outbuildings, subject to like terms, covenants, and conditions. The Secretary is authorized to lease said lands, dwellings, and outbuildings to the grantors threreof for a term of not more than twenty-five years, at $1 per annum, and during the period of the leasehold the Secretary may provide protective custody for such property.

SECTION 3

Upon expiration or surrender of the aforesaid lease the property shall become a detached unit of the Fire Island National Seashore, and shall be administered, protected, and developed in accordance with the laws applicable thereto subject, with respect to said main dwelling and the furnishings therein, to such terms, covenants, and conditions which the Secretary shall have accepted and approved upon the donation thereof as in the public interest.

APPROVED OCTOBER 9, 1965.

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PUBLIC LAW 94-578
94th Congress
October 21, 1976

AN ACT

To provide for increases in appropriation ceilings and boundary changes in certain units of the National Park System, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congess assembled,

TITLE I -- ACQUISITION CEILING INCREASES

SECTION 101

The limitations on appropriations for the acquisition of lands and interests therein within units of the National Park System contained in the following Acts are amended as follows:

(5) FIRE ISLAND NATIONAL SEASHORE, NEW YORK: Section 10 of the Act of September 11, 1964 (78 Stat. 928) is amended by changing "$16,000,000" to "$18,000,000".

APPROVED OCTOBER 21, 1976

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PUBLIC LAW 95-625
95th Congress
November 10, 1978

AN ACT

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE AND TABLE OF CONTENTS

Section 1. This Act may be cited as the "National Parks and Recreation Act of 1978".

TITLE III - BOUNDARY CHANGES

SECTION 322. Fire Island National Seashore

(a) Subsection 1 (b) of the Act of September 11, 1964 (78 Stat. 928), as amended, is further amended to read as follows:

Boundaries
16 USC 459e.

"(b) The boundaries of the national seashore shall extend from the easterly boundary of the main unit of Robert Moses State Park eastward to Moriches Inlet and shall include not only Fire Island proper, but also such islands and marshlands in the Great South Bay, Bellport Bay, and Moriches Bay adjacent to Fire Island as Sexton Island, West Island, Hollins Island, Ridge Island, Pelican Island, Pattersquash Island, and Reeves Island and such other small and adjacent islands, marshlands, and wetlands as would lend themselves to contiguity and reasonable administration within the national seashore and, in addition, the waters surrounding said area to distances of one thousand feet in the Atlantic Ocean and up to four thousand feet in Great South Bay and Moriches Bay and, in addition, mainland terminal and headquarters sites, not to exceed a total of twelve acres, on the Patchogue River within Suffolk County, New York, all as delineated on a map identified as 'Fire Island National Seashore', numbered OGP-0004, dated May 1978. The Secretary shall publish said map in the Federal Register, and it may also be examined in the offices of the Department of the Interior."

Map, publication in Federal Register

(b) Section 2 of such Act is amended by adding the following new subsection at the end thereof:

Undeveloped tracts and property.
16 USC 459e-1

"(g) The authority of the Secretary to condemn undeveloped tracts within the Dune District as depicted on map entitled 'Fire Island National Seashore' numbered OGP-0004 dated May, 1978, is suspended so long as the owner or owners of the undeveloped property therein maintain the property in its natural state. Undeveloped property within the Dune District that is acquired by the Secretary shall remain in its natural state."

16 USC 459e-6

(c) Section 7 (b) of such Act is amended by striking the phrase "Brookhaven town park at" and inserting in lieu thereof: "Ocean Ridge portion of".

16 USC 459e-9

(d) Section 10 of such Act is amended by striking "$18,000,000" and inserting in lieu thereof "$23,000,000".

APPROVED NOVEMBER 10, 1978.

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PUBLIC LAW 96-585
96th Congress
December 23, 1980

AN ACT

TO DESIGNATE CERTAIN LANDS OF THE FIRE ISLAND NATIONAL SEASHORE AS THE "OTIS PIKE FIRE ISLAND HIGH DUNE WILDERNESS", AND FOR OTHER PURPOSES.

Otis Pike Fire Island High Dune Wilderness, N.Y. Designation. 16 USC 1132 note.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in accordance with section 3(c) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132(c)), certain lands in the Fire Island National Seashore, New York, comprising approximately one thousand three hundred and sixty three acres, and potential wilderness additions comprising approximately eighteen acres, as depicted on the map entitled "Wildnerness Plan—Fire Island National Seashore", dated December 1980, are hereby designated as the "Fire Island Wilderness". The southern boundary of the wilderness shall be the toe of the primary dunes.

Boundary description and map, filing with congressional committees.

(b) As soon as practicable after this Act takes effect, a map and a description of the boundaries of the wilderness area shall be filed with the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate, and such map and description shall have the same force and effect as if included in that Act: *Provided,* That correction of clerical and typographical errors in such map and description may be made. The map and description of boundaries shall be on file and available for public inspection in the offices of the Superintendent of the Fire Island National Seashore and the Director of the National Park Service.

Potential wilderness additions, administration.

(c) Lands which represent potential wilderness additions, upon publication in the Federal Register of a notice by the Secretary of the Interior that all uses prohibited thereon by the Wilderness Act have ceased, shall thereby be designated wilderness. Pending such designation, the Secretary shall administer such lands in such manner as to preserve, insofar as is possible, their wilderness or potential wilderness character.

(d) Wilderness designation shall not preclude the repair of breaches that occur in the wilderness area, in order to prevent loss of life, flooding, and other severe economic and physical damage to the Great South Bay and surrounding areas.

(e) Section 10 of the Act of September 11, 1964 (78 Stat. 928) is amended by changing the period to a comma, and by adding the following: "and, after the date of enactment of this provision, not more than $500,000 for development".

Appropriation authorization. 16 USC 459e-9.

(f) Authorizations of moneys to be appropriated under this Act shall be effective on October 1, 1981. Notwithstanding any other provision of this Act, authority to enter into contracts, to incur obligations, or to make payments under this Act shall be effective only to the extent, and in such amounts as are provided in advance in appropriate Acts.

APPROVED DECEMBER 23, 1980.

PUBLIC LAW 98-482
98th Congress
October 17, 1984

AN ACT

TO MODIFY FEDERAL LAND ACQUISITION AND DISPOSAL POLICIES CARRIED OUT WITH RESPECT TO FIRE ISLAND NATIONAL SEASHORE, AND FOR OTHER PURPOSES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That this Act may be cited as the "Fire Island National Seashore amendments Act of 1984".

Fire Island National Seashore Amendments Act of 1984. Conservation. Real Property. 16 USC 459e note.

SECTION 2

Section 2 of the Act entitled "An Act to establish the Fire Island National Seashore, and for other purposes", approved September 11, 1964 (16 U.S.C. 459e-1), is amended by adding at the end thereof the following new subsections:

"(h)(1)(A) The Secretary shall sell any property described in subparagraph (B) of this paragraph acquired by condemnation under this Act to the highest bidder; except that—

"(i) no property shall be sold at less than its fair market value; and

"(ii) no property shall be sold unless it is sold subject to covenants or other restrictions that will ensure that the use of such property conforms—

16 USC 459e-2.

"(i) to the standards specified in regulations issued under section 3(a) of this Act which are in effect at the time of such sale, and

"(ii) to any approved zoning ordinance or amendment thereof to which such property is subject.

"(B) The property referred to in subparagraph (A) of this paragraph is any property within the boundaries of the national seashore as delineated on the map mentioned in section 1 except—

"(i) property within the Dune district referred to in subsection (g) of this section;

"(ii) beach or waters and adjoining land within the exempt communities referred to in the first sentence of subsection (e) of this section; and

"(iii) property within the eight-mile area described in the second sentence of subsection (e) of this section; and

"(iv) any property acquired prior to October 1, 1982, that the Secretary determines should be retained to further the purpose of this Act.

Courts, U.S.

"(2) Notwithstanding any other provision of law, all moneys received from sales under paragraph (1) of this subsection may be retained and shall be available to the Secretary, without further appropriation, only for purposes of acquiring property under this Act.

"(i)(1) Upon or after the commencement of any action for condemnation with respect to any property under this Act, the Secretary, through the Attorney General of the United States, may apply to the United States District Court for the Eastern District of New York for a temporary restraining order or injunction to prevent any use of, or construction upon, such property that—

"(A) fails, or would result in a failure of such property, to conform to the standards specified in regulations issued under section 3(a) of this Act in effect at the time such use or construction began; or

"(B) in the case of undeveloped tracts in the Dune district referred to in subsection (g) of this section, would result in such undeveloped property not being maintained in its natural state.

16 USC 459e-2.

"(2) Any temporary restraining order or injunction issued pursuant to such an application shall terminate in accordance with the provisions of section3(g) of this Act.".

Infra.

SECTION 3

Section 3(e) of the Act entitled "An Act to establish the Fire Island National Seashore, and for other purposes", approved September 11, 1964 (16 U.S.C. 459e-2(e)), is

"(e) In the case of any property, including improved property but excluding undeveloped property in the Dune district referred to in section 2(g) of this Act, with respect to which the Secretary's authority to acquire by condemnation has been suspended under this Act if—

16 USC 459e-1.

"(1) such property is, after the date of the enactment of the Fire Island National Seashore Amendments Act of 1984, made the subject of a variance under, or becomes for any reason an exception to, any applicable zoning ordinance approved under this section; and

"(2) such variance or exception results, or will result, in such property being used in a manner that fails to conform to any applicable standard contained in regulations of the Secretary issued pursuant to this section and in effect at the time such variance or exception took effect;

then the suspension of the Secretary's authority to acquire such property by condemnation shall automatically cease.".

SECTION 4

Subsection (b) of section 3 of the Act entitled "An Act to establish the Fire Island National Seashore, and for other purposes", approved September 11, 1964 (16 U.S.C. 459e-2(b)) is amended by striking out "by means of acreage, frontage, and setback requirements." and inserting "by means of limitations or restrictions on the size, location or use of any commercial, residential, and other structures. In accomplishing these objectives, such standards shall seek to reconcile the population density of the seashore at the time of enactment of the Fire Island National Seashore Amendments Act of 1984 with the protection of the natural resources of the Seashore consistent with the purposes for which it has been established as provided by this Act.".

SECTION 5

Section 3 of the Act entitled "An Act to establish the Fire Island National Seashore, and for other purposes", approved September 11, 1984 (16 U.S.C. 459e-2) is amended by adding the following new subsection (g) after subsection (f):

Courts, U.S.

"(g) Notwithstanding any other provision of this Act, the Secretary of the Interior, acting through the Attorney General of the United States, may apply to the United States District Court for the Eastern District of New York for a temporary restraining order or injunction to prohibit the use of, including construction upon, any property within the seashore in a manner that—

"(1) will cause or is likely to cause significant harm to the natural resources of the seashore, or

"(2) is inconsistent with the purposes for which the seashore was established.

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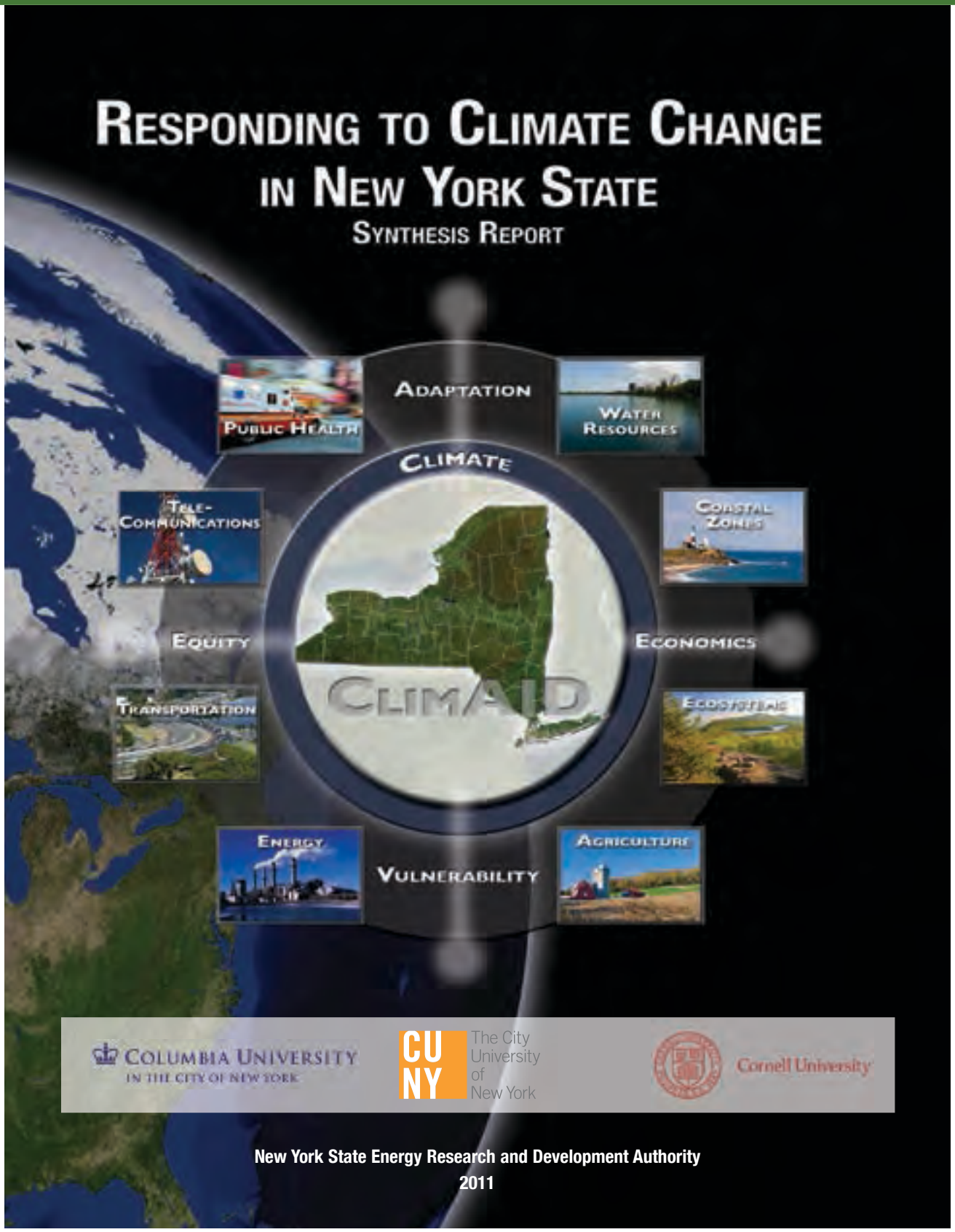
Except to the extent the Court may deem necessary in extraordinary circumstances, no such order or injunction shall continue in effect for more than one hundred and eighty days. During the period of such order or injunction, the Secretary shall diligently and in good faith negotiate with the owner of the property to assure that following termination of the order or injunction, the inconsistent use is abated or the significant harm to the natural resources is mitigated".

APPROVED OCTOBER 17, 1984.

APPENDIX B: Climate Change Synthesis Report



Authorship

ClimAID Synthesis Report Authors

Cynthia Rosenzweig (PI), NASA Goddard Institute for Space Studies and Columbia University
William Solecki (PI), City University of New York, CUNY Institute for Sustainable Cities
Arthur DeGaetano (PI), Northeast Regional Climate Center, Cornell University
Susan Hassol (Science Writer), Climate Communication, LLC
Paul Grabhorn (Graphic Designer), Grabhorn Studio, Inc.
Megan O'Grady (Project Manager), Columbia University
Daniel Bader (Climate), Columbia University
Frank Buonaiuto (Coastal Zones), City University of New York
Jonathan Comstock (Ecosystems and Agriculture), Cornell University
Stephen A. Hammer (Energy), Massachusetts Institute of Technology, formerly with Columbia University
Radley Horton (Climate), Columbia University
Klaus Jacob (Transportation and Telecommunications), Columbia University
Patrick L. Kinney (Public Health), Columbia University
Yehuda Klein (Economics), City University of New York
Robin Leichenko (Equity and Economics), Rutgers University
David C. Major (Economics), Columbia University
Andrew McDonald (Water), New York State Water Resources Institute
Richard S. Ostfeld (Public Health), Cary Institute of Ecosystem Studies
Marta Panero (Economics), New York University
Lily Parshall (Energy), Columbia University
Lesley Patrick (Coastal Zones), City University of New York
Rebecca Schneider (Water), Cornell University
Perry Sheffield (Health), Mount Sinai School of Medicine
Lee Tryhorn (Vulnerability and Adaptation), Cornell University
Peter Vancura (Equity), Rutgers University
David W. Wolfe (Ecosystems and Agriculture), Cornell University

Prepared for

The New York State Energy Research and Development Authority
Albany, NY
www.nyserda.ny.gov

Amanda Stevens, Project Manager

Mark Watson, Program Manager

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Citations

Synthesis Report
Rosenzweig, C., W. Solecki, A. DeGaetano, M. O'Grady, S. Hassol, P. Grabhorn (Eds.). 2011. *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation.* Synthesis Report. New York State Energy Research and Development Authority (NYSERDA), Albany, New York.

Technical Report
Rosenzweig, C., W. Solecki, A. DeGaetano, M. O'Grady, S. Hassol, P. Grabhorn (Eds.). 2011. *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation.* Technical Report. New York State Energy Research and Development Authority (NYSERDA), Albany, New York.

The figures and tables in this document are drawn from the ClimAID Technical Report: *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation.*

Responding to Climate Change in New York State

Climate change is already beginning to affect the people and resources of New York State, and these impacts are projected to grow. At the same time, the state has the potential capacity to address many climate-related risks, thereby reducing negative impacts and taking advantage of possible opportunities.

ClimAID: the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State was undertaken to provide decision-makers with cutting-edge information on the state's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge.

This state-level assessment of climate change impacts is specifically geared to assist in the development of adaptation strategies. It acknowledges the need to plan for and adapt to climate change impacts in a range of sectors: Water Resources, Coastal Zones, Ecosystems, Agriculture, Energy, Transportation, Telecommunications, and Public Health.

The author team for this report is composed of university and research scientists who are specialists in climate change science, impacts, and adaptation. To ensure that the information provided would be relevant to decisions made by public and private sector practitioners, stakeholders from state and local agencies, non-profit organizations, and the business community participated in the process as well.

This document provides a general synthesis of highlights from a larger technical report that includes much more detail, case studies, and references. The larger report provides useful information to decision-makers, such as state officials, city planners, water and energy managers, farmers, business owners, and others as they begin responding to climate change in New York State.

NOTICE

This report was prepared by Columbia University, the City University of New York, and Cornell University in the course of performing work contracted for and sponsored by the New York State Energy Research and Development Authority (hereafter NYSERDA). The opinions expressed in this report do not necessarily reflect those of NYSERDA or the State of New York, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, NYSERDA, the State of New York, and the contractor make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, or other information contained, described, disclosed, or referred to in this report. NYSERDA, the State of New York, and the contractor make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no liability for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

Contents

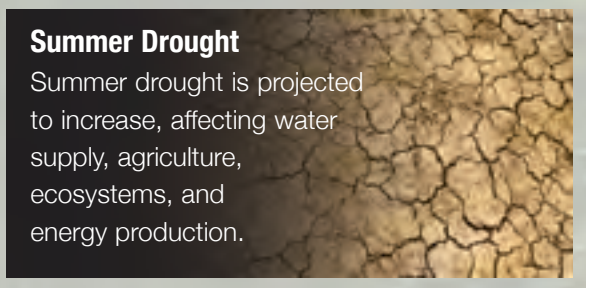
CLIMATE RISKS FOR NEW YORK STATE

Temperatures are increasing, precipitation patterns are changing, and sea level is rising. These climatic changes are projected to occur at much faster than natural rates because of increased amounts of greenhouse gases in the atmosphere. Some types of extreme weather and climate events have already increased in frequency and intensity, and these changes are projected to continue.

These climate changes are already having impacts in some aspects of society, the economy, and natural ecosystems and these impacts are expected to increase. Not all of these changes will be gradual. When certain tipping points are crossed, impacts can increase dramatically. Past climate is no longer a reliable guide to the future. This affects planning for water, energy, and all other social and economic systems.

Interactions
Interactions between climate change and other stresses such as pollution and increasing demand for resources will create new challenges.

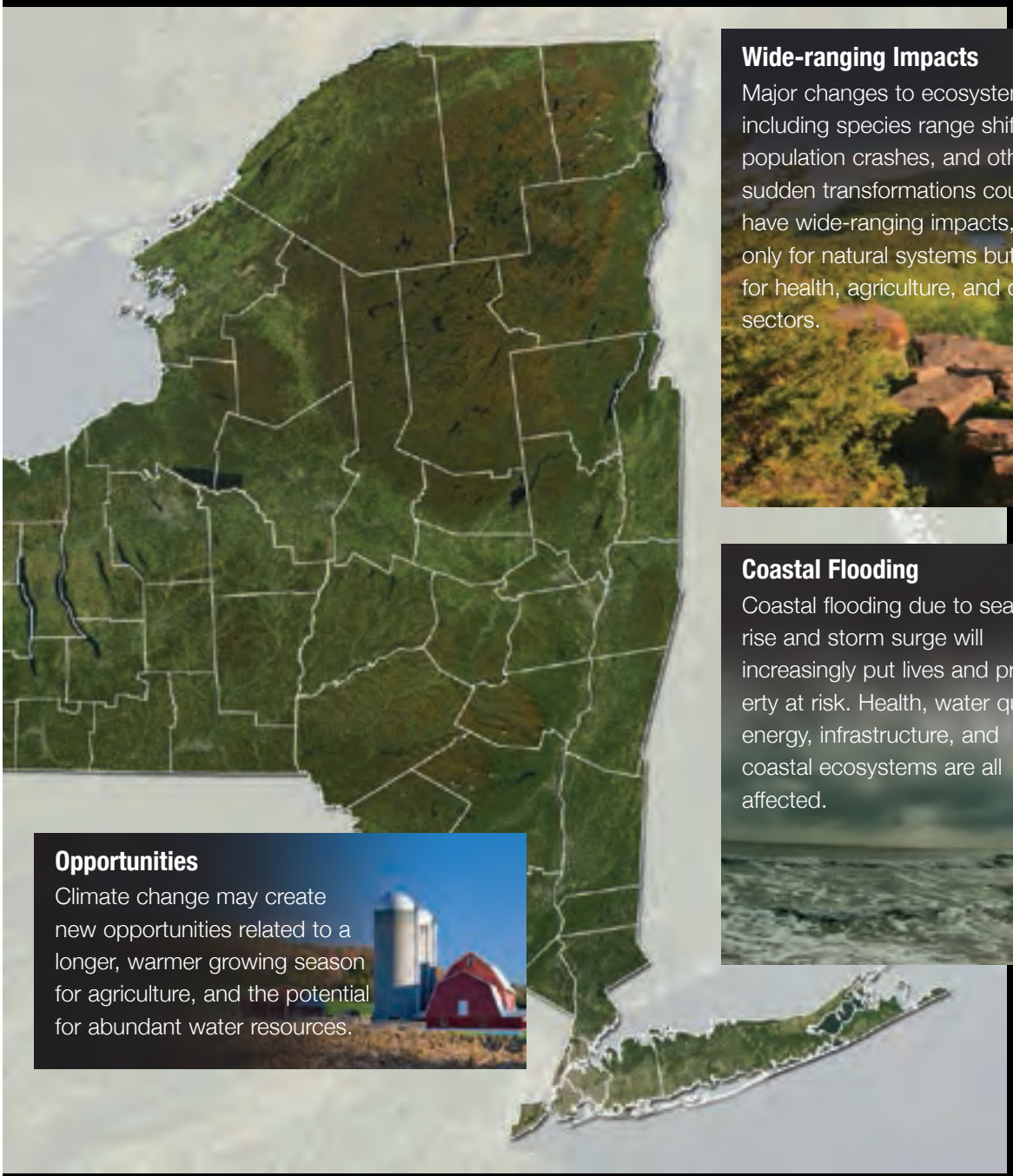
Heat Waves
Heat waves will become more frequent and intense, increasing heat-related illness and death and posing new challenges to the energy system, air quality, and agriculture.



Summer Drought
Summer drought is projected to increase, affecting water supply, agriculture, ecosystems, and energy production.

Heavy Downpours
Heavy downpours are increasing and are projected to increase further. These can lead to flooding and related impacts on water quality, infrastructure, and agriculture.

2



Wide-ranging Impacts

Major changes to ecosystems including species range shifts, population crashes, and other sudden transformations could have wide-ranging impacts, not only for natural systems but also for health, agriculture, and other sectors.

Coastal Flooding

Coastal flooding due to sea level rise and storm surge will increasingly put lives and property at risk. Health, water quality, energy, infrastructure, and coastal ecosystems are all affected.

Opportunities

Climate change may create new opportunities related to a longer, warmer growing season for agriculture, and the potential for abundant water resources.

3

CLIMATE RISKS FOR NEW YORK STATE

Each region of New York State (as defined by ClimAID) has unique attributes that will be affected by climate change. Many of the issues highlighted below are described in more detail in the sector discussions that follow.

Region 1: Western New York Great Lakes Plain

- Agricultural revenue highest in state
- Relatively low rainfall, increased summer drought risk
- High-value crops could need irrigation
- Improved conditions for grapes projected

	Baseline	2050s	2080s
Temperature	48ºF	+3.0 to 5.5º	+4.5 to 8.5º
Precipitation	37in	0 to +10%	0 to +15%

Region 3: Southern Tier

- Dairy dominates agricultural economy
- Milk production losses projected
- Susquehanna River flooding increases
- One of the first parts of the state hit by invasive insects, weeds, and other pests moving north

	Baseline	2050s	2080s
Temperature	46ºF	+3.5 to 5.5º	+4.5 to 8.5º
Precipitation	38in	0 to +10%	+5 to 10%

Region 6: Tug Hill Plateau

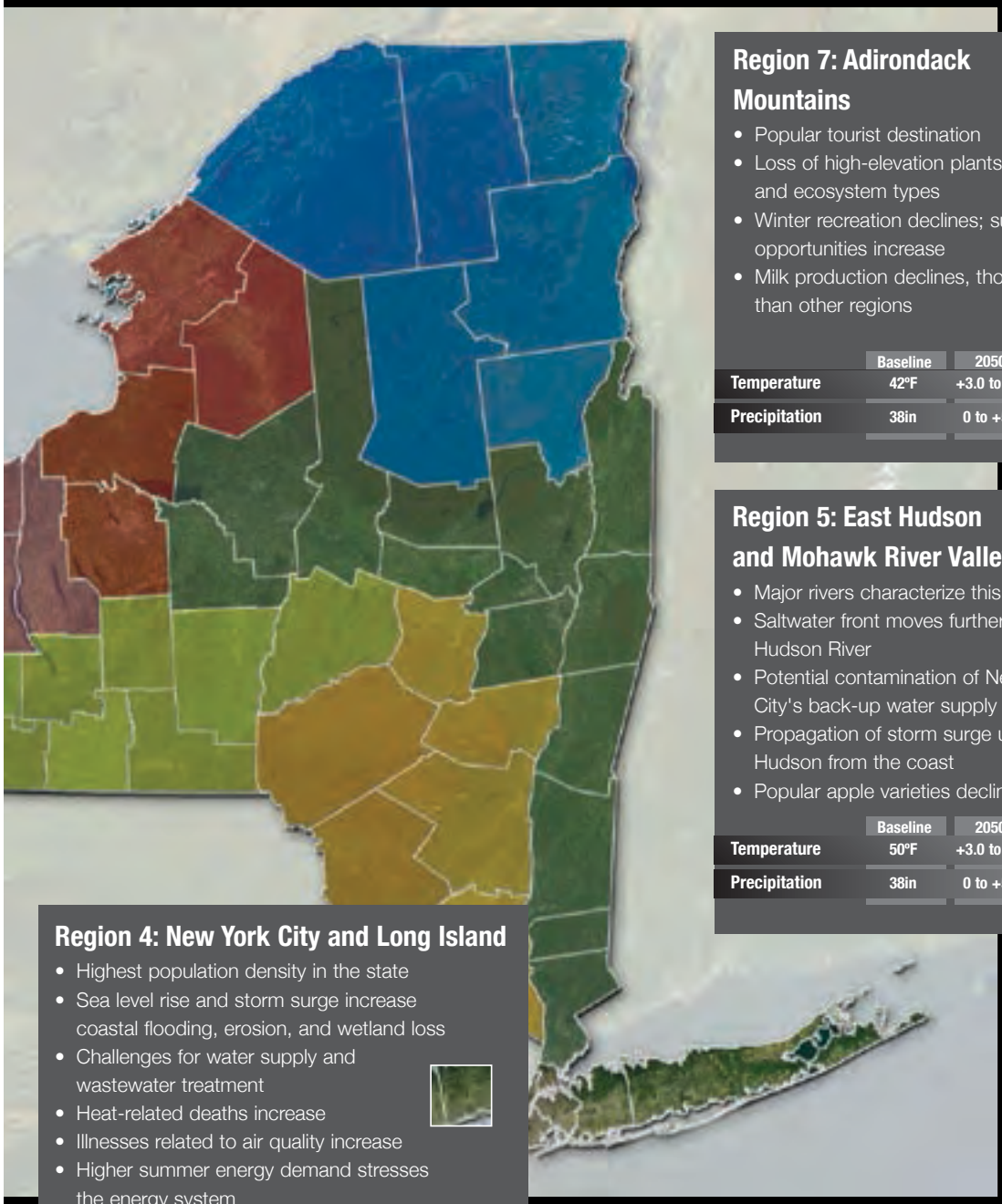
- Important region for hydropower
- Lake effect snows could increase in the short term
- Snowmobiling opportunities decline
- Great Lakes water levels may decline

	Baseline	2050s	2080s
Temperature	44ºF	+3.5 to 5.5º	+4.5 to 9.0º
Precipitation	51in	0 to +10%	+5 to 15%

Region 2: Catskill Mountains and West Hudson River Valley

- Watershed for New York City water supply
- Spruce/Fir forests disappear from mountains
- Popular apple varieties decline
- Winter recreation declines; summer opportunities increase
- Hemlock wooly adelgid destroys trees
- Native brook trout decline, replaced by bass

	Baseline	2050s	2080s
Temperature	48ºF	+3.0 to 5.0º	+4.0 to 8.0º
Precipitation	48in	0 to +10%	+5 to 10%



Region 7: Adirondack Mountains

- Popular tourist destination
- Loss of high-elevation plants, animals, and ecosystem types
- Winter recreation declines; summer opportunities increase
- Milk production declines, though less than other regions

	Baseline	2050s	2080s
Temperature	42ºF	+3.0 to 5.5º	+4.0 to 9.0º
Precipitation	38in	0 to +5%	+5 to 15%

Region 5: East Hudson and Mohawk River Valleys

- Major rivers characterize this region
- Saltwater front moves further up the Hudson River
- Potential contamination of New York City's back-up water supply
- Propagation of storm surge up the Hudson from the coast
- Popular apple varieties decline

	Baseline	2050s	2080s
Temperature	50ºF	+3.0 to 5.5º	+4.0 to 8.0º
Precipitation	38in	0 to +5%	+5 to 10%

Region 4: New York City and Long Island

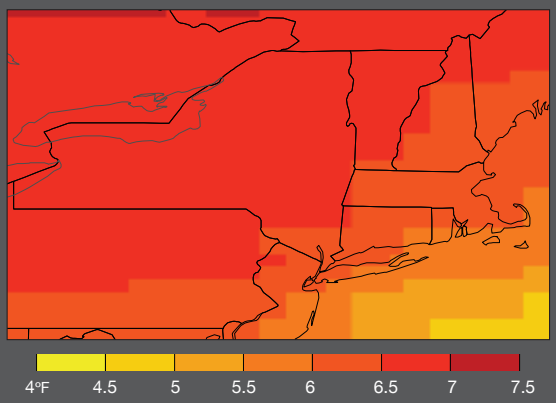
- Highest population density in the state
- Sea level rise and storm surge increase coastal flooding, erosion, and wetland loss
- Challenges for water supply and wastewater treatment
- Heat-related deaths increase
- Illnesses related to air quality increase
- Higher summer energy demand stresses the energy system

	Baseline	2050s	2080s
Temperature	53ºF	+3.0 to 5.0º	+4.0 to 7.5º
Precipitation	47in	0 to +10%	+5 to 10%

5

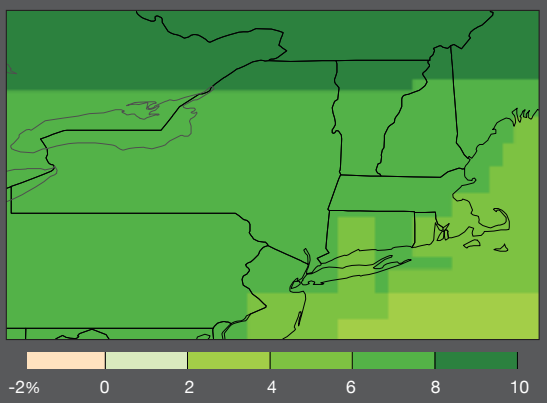
CLIMATE PROJECTIONS

Projected Annual Temperature Change, 2080s (°F)



Average annual temperatures are projected to increase by 4.0 to 9.0°F by the 2080s, with the lower end of this range projected under lower greenhouse gas emissions scenarios and the higher end under higher emissions scenarios. A mid-range emissions scenario, A1B, was used for the maps above, yielding temperature increases of about 7°F for most of the state. The A1B trajectory is associated with relatively rapid increases in emissions for the first half of this century, followed by a gradual decrease in emissions after 2050.

Projected Annual Precipitation Change, 2080s (%)



Precipitation across New York State may increase by approximately 5 to 15 percent by the 2080s, with the greatest increases in the northern parts of the state. Much of this additional precipitation may occur during the winter months as rain, while late summer and early fall precipitation could decline slightly. Both maps show the average across 16 global climate models.

Temperatures are expected to rise across the state, by 1.5 to 3°F by the 2020s, 3 to 5.5°F by the 2050s, and 4 to 9°F by the 2080s. The lower ends of these ranges are for lower greenhouse gas emissions scenarios (in which society reduces heat-trapping emissions) and the higher ends for higher emissions scenarios (in which emissions continue to increase). These are not the best and worst cases, however. Sharp cuts in global emissions could result in temperature increases lower than the bottoms of these ranges, while a continuation of business-as-usual could result in increases higher than the high ends.

Annual average precipitation is projected to increase by up to 5 percent by the 2020s, up to 10 percent by the 2050s, and up to 15 percent by the 2080s. This will not be distributed evenly over the course of the year. Much of this additional precipitation is likely to occur during the winter months as rain, with the possibility of slightly reduced precipitation projected for the late summer and early fall.

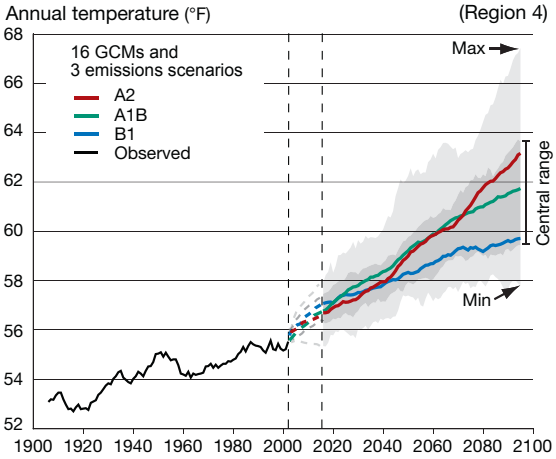
Continuing the observed trend, more precipitation is expected to fall in heavy downpours and less in light rains.

Sea level rise projections that do not include significant melting of the polar ice sheets (which is already observed to be occurring) suggest 1 to 5 inches of rise by the 2020s, 5 to 12 inches by the 2050s, and 8 to 23 inches by the 2080s. Scenarios that include rapid melting of polar ice project 4 to 10 inches of sea level rise by the 2020s, 17 to 29 inches by the 2050s, and 37 to 55 inches by the 2080s.

Projected Seasonal Precipitation Change, 2050s (% change)

ClimAID Region	Winter	Spring	Summer	Fall
1. Western New York Great Lakes Plain	+5 to +15	0 to +15	-10 to +10	-5 to +10
2. Catskill Mountains and West Hudson River Valley	0 to +15	0 to +10	-5 to +10	-5 to +10
3. Southern Tier	+5 to +15	0 to +10	-5 to +5	-10 to +5
4. New York City and Long Island	0 to +15	0 to +10	-5 to +10	-5 to +10
5. East Hudson and Mohawk River Valleys	+5 to +15	-5 to +10	-5 to +5	-5 to +10
6. Tug Hill Plateau	+5 to +15	0 to +10	-5 to +10	-5 to +10
7. Adirondack Mountains	+5 to +15	-5 to +10	-5 to +5	-5 to +10

Observed and Projected Annual Temperature Change

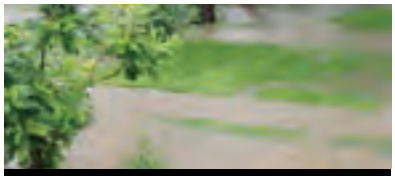


These climate-related risks will affect the state's economy and environment. Some of the most serious vulnerabilities and potential adaptation strategies are highlighted in this report.

The amount of future temperature rise New York state will experience depends largely on the level of global heat-trapping emissions. Temperature increases under three possible emissions scenarios are shown, each run with 16 global climate models. These are neither best case nor worst case; actual changes could be lower if emissions are cut aggressively, or higher if the world continues on a business as usual course. The shaded area indicates the full range of possible temperature rise projected by the models for these scenarios.

Higher temperatures and increased heat waves have the potential to

- increase fatigue of materials in water, energy, transportation, and telecommunications infrastructure;
- affect drinking water supply;
- cause a greater frequency of summer heat stress on people, plants, and animals;
- alter pest populations and habits, affecting agriculture and ecosystems;
- change the distribution of key crops such as apples, cabbage, and potatoes;
- reduce dairy milk production;
- increase electricity demand for cooling;
- lead to declines in air quality that are linked to respiratory illness; and
- cause more heat-related deaths.



Increased frequency of heavy downpours has the potential to

- affect drinking water supply;
- heighten risk of river flooding;
- flood key rail lines, roadways, and transportation hubs; and
- increase delays and hazards related to extreme weather events.

Sea level rise and coastal flooding have the potential to

- increase risk of storm surge-related flooding along the coast;
- expand areas at risk of coastal flooding;
- increase vulnerability of energy facilities located in coastal areas;
- flood transportation and telecommunication facilities; and
- cause saltwater intrusion into some freshwater supplies near the coasts.

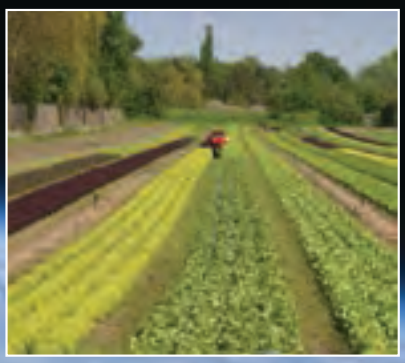
Projected Sea Level Rise for New York State (inches)

Modeled Sea Level Rise	2020s	2050s	2080s
GCM-based	+1 to +5	+5 to +12	+8 to +23
Rapid ice melt scenario	+4 to +10	+17 to +29	+37 to +55

The central range of sea level rise projections across New York City and up the Hudson River Estuary to the Troy Dam is shown, rounded to the nearest inch, based on the average of the ClimAID Global Climate Model (GCM)-based scenario for a range of greenhouse gas emissions as reported by IPCC 2007 and the ClimAID rapid ice melt scenario (based on accelerated melting of the Greenland and West Antarctic Ice Sheets).

7

ADAPTATION CAN REDUCE IMPACTS



Adaptation refers to actions taken to prepare for climate change, helping to reduce adverse impacts or take advantage of beneficial ones.

Strategies can include changes in operations, management, infrastructure, and/or policies that reduce risk and/or capitalize on potential opportunities associated with climate change. Adaptations can take place at the individual, household, community, organization, and institutional level. Adaptation can be thought of as just better planning, incorporating the most current information about climate into a variety of decisions. Adaptation should be woven into the everyday practices of organizations and agencies.

Adaptive capacity refers to the ability of a system to adjust to actual or expected climate stresses or to cope with their consequences.

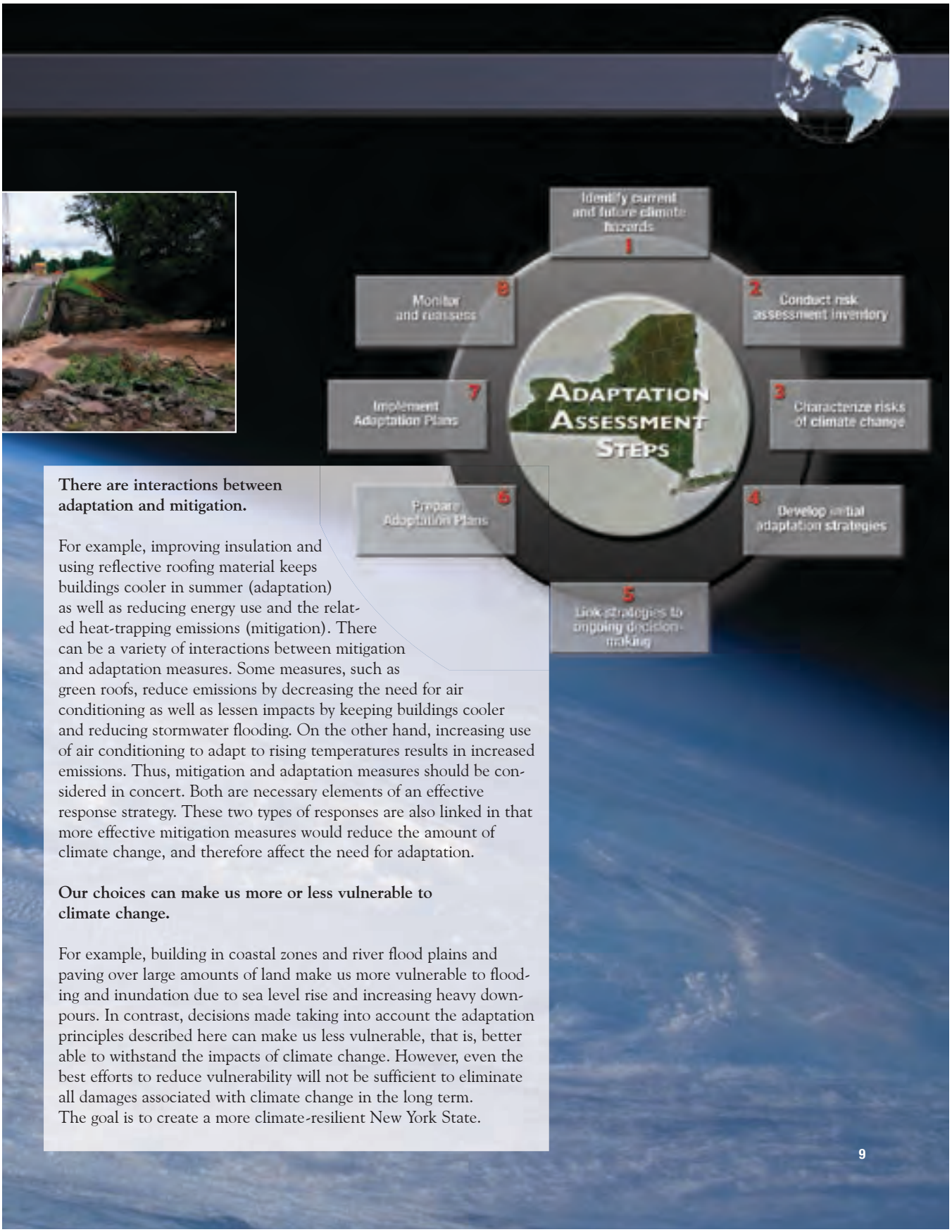
New York State as a whole is generally considered to have significant resources and capacity for effective adaptation responses. However, the costs and benefits of adaptation will not be evenly distributed throughout the state. There can also be a variety of unintended consequences of adaptation options. For example, building sea walls to protect coastal property from rising sea levels can exacerbate the loss of coastal wetlands that serve to protect coastlines from storm surge damage.

Adaptations undertaken in one sector often have implications for other sectors.

For example, increased use of air conditioning is an adaptation to reduce heat-related illness and death in the health sector as well as to reduce heat stress on livestock in the agriculture sector. However, such a strategy would increase peak summer energy use, increasing demands on both energy and water resources. If increased tree planting is used to reduce urban heat, it will be important to plant low-pollen tree species because allergenic pollen is on the rise in a warmer, higher-CO_2 world. These examples point to the need for integrated thinking about adaptation strategies to avoid creating new problems. In addition, climate change and some adaptation options can worsen social and economic inequalities that are already present and create new inequalities. This raises equity issues that are discussed on the following pages.

Adaptation strategies do not directly include actions aimed at reducing the speed and amount of climate change.

Actions to reduce climate change, often called "mitigation," involve lowering emissions of heat-trapping gases or increasing their removal from the atmosphere. Mitigation measures would reduce climate change impacts in the longer term.



There are interactions between adaptation and mitigation.

For example, improving insulation and using reflective roofing material keeps buildings cooler in summer (adaptation) as well as reducing energy use and the related heat-trapping emissions (mitigation). There can be a variety of interactions between mitigation and adaptation measures. Some measures, such as green roofs, reduce emissions by decreasing the need for air conditioning as well as lessen impacts by keeping buildings cooler and reducing stormwater flooding. On the other hand, increasing use of air conditioning to adapt to rising temperatures results in increased emissions. Thus, mitigation and adaptation measures should be considered in concert. Both are necessary elements of an effective response strategy. These two types of responses are also linked in that more effective mitigation measures would reduce the amount of climate change, and therefore affect the need for adaptation.

Our choices can make us more or less vulnerable to climate change.

For example, building in coastal zones and river flood plains and paving over large amounts of land make us more vulnerable to flooding and inundation due to sea level rise and increasing heavy downpours. In contrast, decisions made taking into account the adaptation principles described here can make us less vulnerable, that is, better able to withstand the impacts of climate change. However, even the best efforts to reduce vulnerability will not be sufficient to eliminate all damages associated with climate change in the long term. The goal is to create a more climate-resilient New York State.

9

ADAPTATION CAN REDUCE IMPACTS

Reduce other stresses to help improve the adaptive capacity of any system, making it more resilient to climate change. This is true for water and energy supply systems, natural ecosystems, and other sectors.

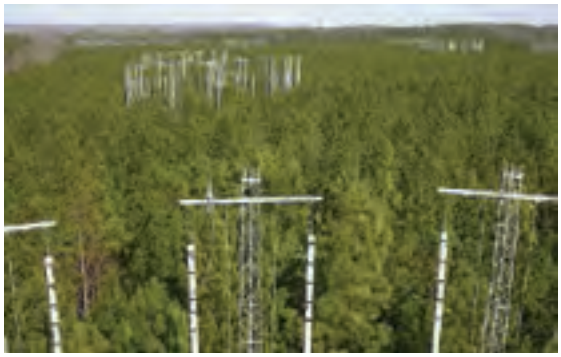
- For ecosystems, options include reducing human transport of invasive species, controlling sprawl and other habitat destruction, and providing dispersal corridors to allow species range shifts in response to climate change.
- For water and energy systems, options include lowering demand through efficiency measures and consumer education.
- For coasts, reducing development and preserving wetlands through various policies can help.
- For human health, pollution reduction and better management of chronic disease would increase resilience.

Take advantage of normal capital repair and replacement cycles of infrastructure to build in climate change adaptations that are flexible to future conditions.

- When building long-lived infrastructure, such as power plants, tunnels, and bridges, consider projected increases in temperature and sea level, and changes in precipitation patterns.
- Designing a 1-foot floodwall with a strong enough foundation to support an added foot or two of height if needed is an example of flexible adaptation.
- When building new dairy barns, design for better ventilation and possibly the ability to add other cooling technologies.
- Incorporate climate change projections such as the increase in heavy downpours and sea level rise in capital investment decisions currently being made in storm water and wastewater systems.

Examine and revise regulatory mechanisms and land use policies such as zoning, setbacks, building codes, and incentives, taking climate change into account.

- Regulations concerning infrastructure such as those that govern bridge height and clearance, dam height and strength, materials used, dimensions of drainage culverts for roads, roof strength, and foundation depth should be reconsidered.
- Definitions of flood zones should be revisited and how they may change in the future should be considered.
- Regulations that affect adaptive capacity should be assessed. For example, stronger regulations to control invasive species can help make ecosystems more resilient, and stronger efficiency standards can make water and energy systems more resilient.
- Changes in treaties such as those governing water rights might be appropriate if the amounts and distributions of the resources change. Risk sharing mechanisms, including various types of insurance and regional planning approaches, should also be examined.



Improve monitoring, measurement, and data gathering and distribution to provide the information needed to adapt as climate change proceeds.

- Monitor climate change science for the latest developments.
- A central repository for information on new norms for climate, species, etc. would help to reduce uncertainty and better inform policy.
- Monitoring the effectiveness of various adaptation strategies is important.
- There is a need to better monitor hazards and events, and to archive and make this information widely available. This might include air quality monitoring, citizen watches for invasive species, and real-time data gathering on the impacts of extreme weather events (such as crop and timber value lost, reduction in dairy production, cost of property damaged, and numbers of heat-related illnesses and deaths).
- In addition to monitoring hazards, events, and adaptation strategies, combine the tracking of these indicators to improve understanding of what impacts will result from various climate events and what adaptation strategies are effective.

ENVIRONMENTAL EQUITY

Climate change risks, vulnerabilities, and capacities to adapt are uneven across regions, sectors, households, individuals, and social groups.

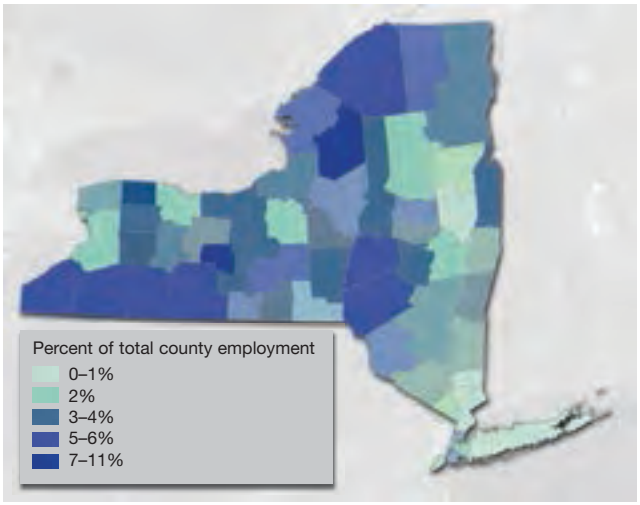
Certain groups will be disproportionately affected by the impacts of climate change.

Equity issues emerge because climate change impacts and adaptation policies can worsen existing inequalities and can also create new patterns of winners and losers.

Intergenerational equity issues arise from the fact that future generations will suffer the consequences of past and current generations' actions.

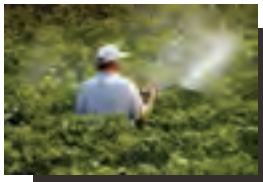
The same groups, such as the elderly, tend to be at risk for adverse impacts of climate change across multiple sectors.

Employment in Agriculture, Forestry, Fishing, and Related Activities



Areas/Locations

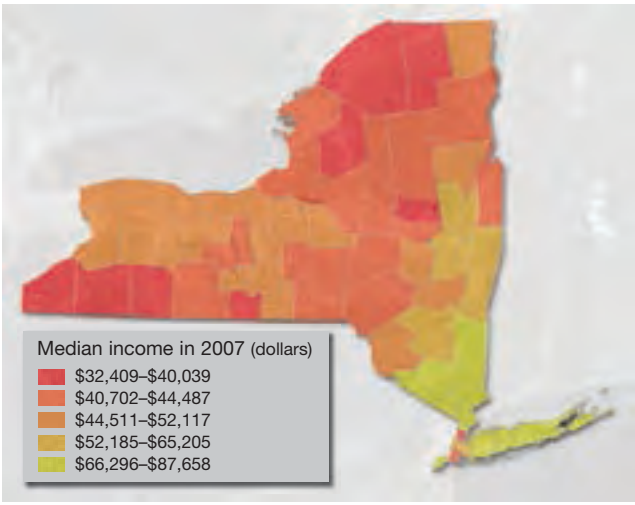
- Rural areas, especially small towns, are more vulnerable to, and have less capacity to cope with, extreme events such as floods, droughts, ice storms, and other climate-related stressors.
- Regions that depend on agriculture and tourism (such as fishing, skiing, and snowmobiling) may be especially in need of adaptation assistance.
- Low-income urban neighborhoods, especially those within flood zones, are less able to cope with climate impacts such as heat waves, flooding, and coastal storms.
- Coastal zones are vulnerable to sea level rise and storm surge. There are already numerous properties in coastal zones that cannot get insurance, for example.



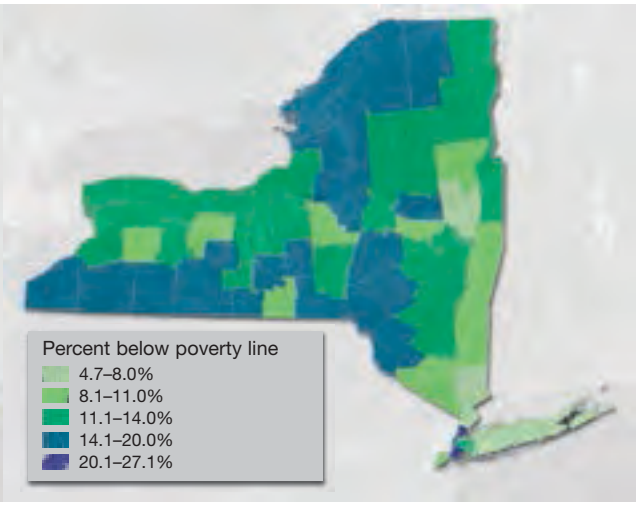
Groups

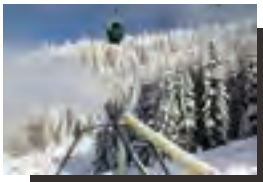
- Elderly, disabled, and health-compromised individuals are more vulnerable to climate hazards, including floods and heat waves.
- Low-income groups have limited ability to meet higher energy costs, making them more vulnerable to the effects of heat waves.
- Those who lack affordable health care are more vulnerable to climate-related illnesses such as asthma.
- Those who depend on public transportation to get to work, and lack private cars for evacuating during emergencies, are vulnerable.
- Farm workers may be exposed to more chemicals if pesticide use increases in response to climate change.
- Asthma sufferers will be more vulnerable to the decline in air quality during heat waves.

Income Disparities



Poverty Rates

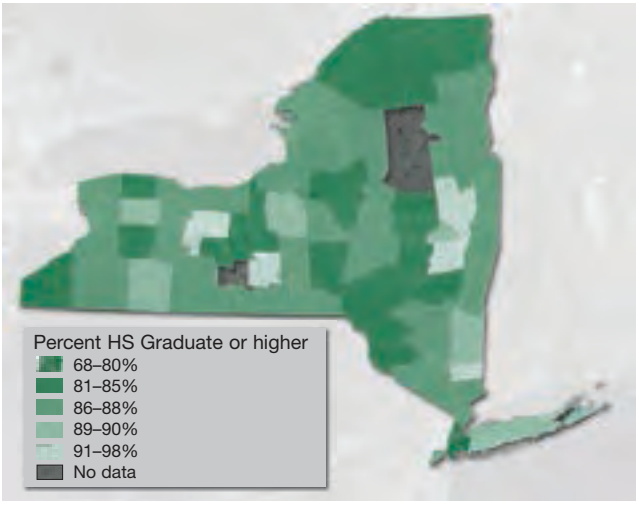




Firms and Industries

- Smaller businesses are less able to cope with climate-related interruptions and stresses than larger businesses.
- With often more limited capital reserves, smaller firms are less able to withstand revenue loss associated with power and communication service disruptions.
- Small businesses tend to have less capital available to make investments to promote adaptation, such as the use of snowmaking in ski areas, or adoption of new crops or techniques on small farms.

Educational Attainment



There is a need for more attention to how the impacts of climate change adaptation policies affect different populations, areas, and industries. Affected communities and populations should have a voice in the adaptation policy process.

ECONOMICS

New York State's climate has already begun to change, and impacts related to increasing temperatures and sea level rise are already being felt in the state, with associated costs. Future climate change has the potential to cause even more significant economic costs for New York State. Additional economic costs are likely to approach or exceed ten billion dollars per year by the middle of this century. However, many costs of climate change are still not known and are difficult to estimate. Climate-change related economic impacts will be experienced in all sectors, types of communities, and regions across the state.

Regions

All regions of the state will incur economic costs associated with climate change. Specific economic impacts will affect particular regions. For example, the negative impact on the state's winter recreation industry will adversely affect the Catskill and Adirondack regions.

The coastal zone, because of its relative exposure and vulnerability to storms and the concentration of residences, businesses, and infrastructure on the shore, will experience the greatest economic impact of any single region. The urbanized areas of the state with high population density will incur higher public health costs because of existing and projected urban heat island conditions.

Sectors

All sectors will incur costs associated with climate change; however, the costs will be highly uneven across and within sectors.

- All sectors are likely to experience significant economic impacts that may alter the overall structure and function of the sector.
- Water- and flooding-related management costs will affect almost all sectors.
- The highest direct economic costs of climate change are connected to large-scale capital investment, housing, and commercial activity in the coastal zone.
- Sectors such as agriculture and telecommunications are inherently dynamic, changing annually, seasonally, and in some cases even daily. The economic consequences of climate change will be woven into the risk management and operations of these sectors.

Types of Climate Impact Costs

Direct costs include costs that are incurred as the direct economic outcomes of a specific climate event or aspect of climate change. Direct costs can be measured by standard methods of national income accounting, including lost production and loss of value to consumers.

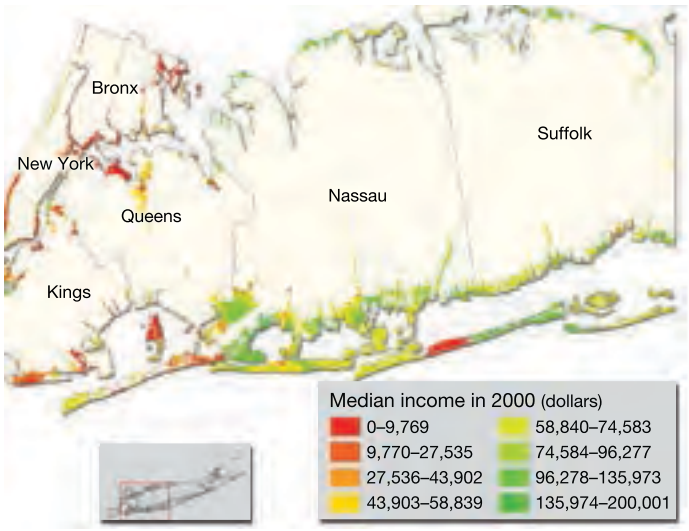
Indirect costs are costs incurred as secondary outcomes of the direct costs of a specific event or facet of climate change. Examples include jobs lost in firms that provide inputs to firms directly harmed by climate change.

Impact costs are direct costs associated with the impacts of climate change, for example the reduction in milk produced by dairy cows due to heat stress.

Adaptation costs include direct costs associated with adapting to the impacts of climate change, such as the cost of cooling dairy barns to reduce heat stress on dairy cows.

Costs of residual damage are direct costs of impacts that cannot be adapted to—for example, reductions in milk production due to heat stress that may occur if cooling capacity is exceeded.

Economic Diversity of Population in the 1-in-100-year Coastal Flood Zone



New York City and Long Island are among the areas most at risk from climate change. The areas in color on this map are already at risk from coastal flooding during storms, and much more land will be at risk as sea level rise accelerates. The impacts and costs of climate change and adaptation options in this heavily developed coastal zone will be large and varied. There is a great deal of property in harm's way, including long-lived, high-value infrastructure such as roads, airports, bridges, and power plants. As shown on the map, the population of this region is very diverse, from low income inner-city neighborhoods to very high income communities.

Timing

Economic costs of climate change impacts will generally increase throughout the century as the rate of climate change accelerates. Some of the largest costs will be associated with extreme events such as large-scale floods and heat waves. Costs associated with average climate changes are expected to increase more slowly over time.

The timing of impacts could be more mixed for sectors that are expected to experience both potential benefits and costs. For example, in the agricultural sector, short-term costs could eventually be overwhelmed by the emergence of longer-term benefits, or vice versa.

Climate Change Adaptation Costs and Benefits

The implementation of adaptation strategies will bring economic benefits to the state. For each sector, a wide variety of adaptation options at varying costs are available.

- Transportation, the coastal zone, and water resources will have the most significant climate change impact costs and will require the most adaptations.
- Energy, telecommunications, and agriculture sectors have costs that could be large if there is no adaptation; but adaptation to climate could be seen as a regular part of moderate re-investment.
- The benefit-cost ratio comparing avoided impacts to costs of adaptation is highest for the public health and coastal zones sectors, moderate for the water resources, agriculture, energy, and transportation sectors, and low for the telecommunications sector.

WATER RESOURCES

Context

New York State has an abundance of water resources, including large freshwater lakes, high-yielding groundwater aquifers, and major rivers.

Water resources are managed by a diverse array of large and small agencies, governments, and institutions, with little statewide coordination.

Water resources are already subject to numerous human-induced stresses, such as increasing demand for water and insufficient water supply coordination; these pressures are likely to increase over the next several decades.

Water quality is already at risk from aging wastewater treatment plants, continued combined sewage overflow events, and excess pollution from agricultural and urban areas.

Key Climate Impacts

Rising air temperatures intensify the water cycle by driving increased evaporation and precipitation. The resulting altered patterns of precipitation include more rain falling in heavy events, often with longer dry periods in between. Such changes can have a variety of effects on water resources.

Heavy downpours have increased over the past 50 years, and this trend is projected to continue, causing an increase in localized flash flooding in urban areas and hilly regions.

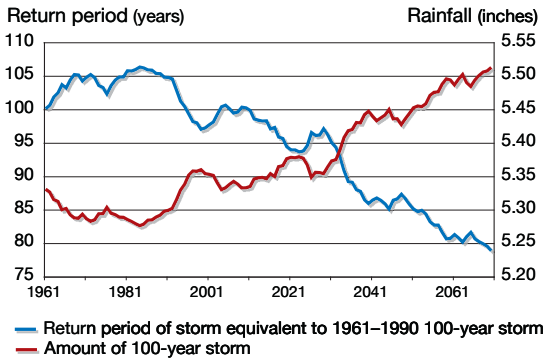
Flooding has the potential to increase pollutants in the water supply and inundate wastewater treatment plants and other vulnerable development within floodplains.

Less-frequent summer rainfall is expected to result in additional, and possibly longer, summer dry periods, potentially impacting the ability of water supply systems to meet demands.

Reduced summer flows on large rivers and lowered groundwater tables could lead to conflicts among competing water users.

Increasing water temperatures in rivers and streams will affect aquatic heath and reduce the capacity of streams to assimilate effluent from wastewater treatment plants.

Projected Rainfall and Frequency of Extreme Storms



The amount of rain falling in a "100-year" storm is projected to increase (red line), while the number of years between such storms ("return period") is projected to decrease (blue line). Thus, rainstorms will become both more severe and more frequent. These results, from the UK Met Office Hadley Centre Climate Model Version 3 (HadCM3), are broadly consistent with those of the other 15 GCMs used by ClimAID.

Adaptation Options

Adaptation can build on water managers' existing capacity to handle large variability. Strategies can be designed to be flexible to a range of future conditions. New York's relative wealth of water resources, if properly managed, can contribute to resilience and new economic opportunities.

Operations, Management, and Infrastructure Strategies

- Relocate infrastructure such as wastewater treatment plants and high-density housing to higher elevations and outside of high-risk floodplains. For infrastructure that must remain in the floodplain, elevate structures and construct berms or levees to reduce flood damage.
- Adopt stormwater infrastructure and management practices and upgrade combined sewer and stormwater systems to reduce pollution.

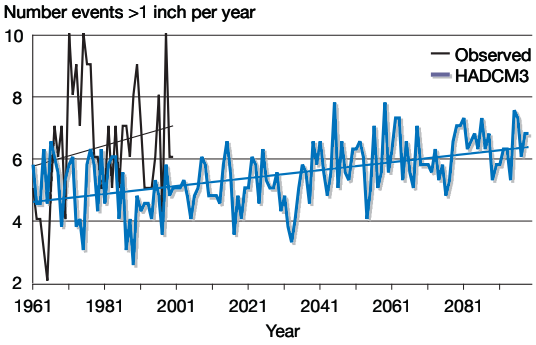
Larger-scale Strategies

- Use multiple strategies to increase water use efficiency. Conserve water through leak detection programs; use of low-flow showerheads, toilets, and washing machines; and rain barrels for garden watering. Research equitable water-pricing programs.
- Establish streamflow regulations that mimic natural seasonal flow patterns, including minimum flow requirements, to protect aquatic ecosystem health.
- Expand basin-level commissions to provide better oversight, address water quality issues, and take leadership on monitoring, conservation, coordination of emergency response, and new infrastructure.
- Develop more comprehensive drought management programs that include improved monitoring of water supply storage levels and that institute specific conservation measures when supplies decline below set thresholds. Update and enlarge stockpiles of emergency equipment to help small water supply systems and to assist during emergencies.

Co-benefits

Continuing and expanding current water resource management practices, such as reducing stormwater runoff into water bodies, will benefit pollution control as well as climate adaptation. Encouraging water conservation strategies and minimum flow criteria to prepare for potential summer droughts will help to guarantee water sufficiency.

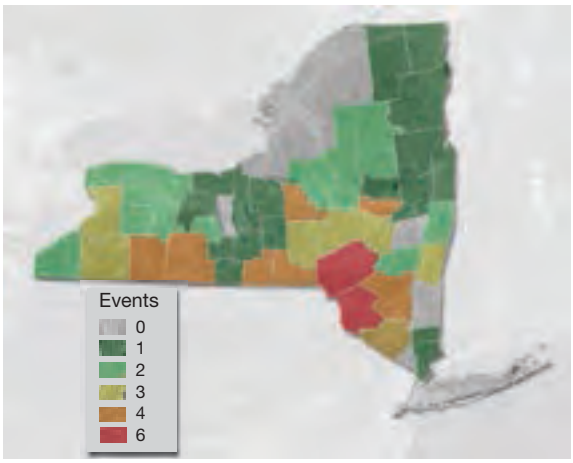
The Number of Rainfall Events over One Inch, 1960–2100



The observed number of rainfall events exceeding one inch from 1960 to 2000 is shown by the black line, and the projected number of such events, using the HadCM3 model, is show by blue line. These results are broadly consistent with those of the other 15 GCMs used by ClimAID.

WATER RESOURCES

Flood Events per County, 1994–2006



Number of FEMA-declared flood disasters in New York State counties. (FEMA)

Particularly Vulnerable Groups

Smaller water systems are more vulnerable to drought and other types of water supply disruptions than larger systems, since large systems tend to be more closely managed and often have more resources for dealing with drought.

The elderly and people with disabilities tend to be more vulnerable to immediate flood hazards due to limited mobility.

Rapidly developing, higher-income exurban communities may experience water scarcity as demand increases in these areas and overwhelms local supplies.

Lower-income or non-English-speaking populations may be particularly vulnerable to increasing levels of disease-causing agents in the water supply or contaminants in well water as they may be less aware of government programs and warnings and have less access to health care.

Susquehanna River Flooding, June 2006

The value of preparedness

Flooding is already a major problem across New York State with damages costing an average of $50 million each year. There are several flood management strategies that can help solve current problems while addressing possible future ones.

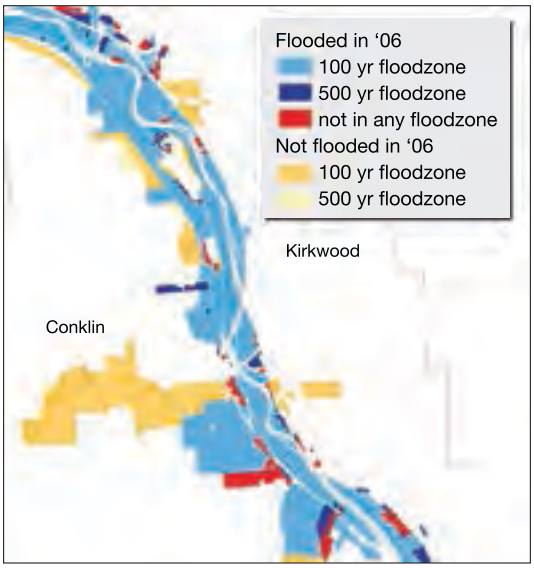
The June 2006 Susquehanna River flood—the largest on record since gauging began on the river in 1912—provides insights into strategies that can be used to reduce flood risks and impacts. Record precipitation from June 25 to 28, totaling 3 to 11 inches, culminated in significant flooding in the basin. Twelve counties in New York and thirty in Pennsylvania were declared disaster areas. Rainfall coupled with runoff from steep hillsides contributed to river water levels rising from less than 5 feet to nearly 21 feet in nine hours. Broome County incurred the most damages.

In Broome County, about 3,350 properties were flooded. Fifty-eight percent of the flooded properties were residential and 10 percent were commercial. Nearly 30 percent of the shopping area, two sewage treatment plants, a public works facility, a hospital, and several hundred miles of roads were also flooded. The town of Conklin was the hardest hit, with 30 percent of its properties flooded, followed by 13 percent in Kirkwood, and 10 percent in Port Dickinson. In total, 1,020 of the properties that were flooded were not within FEMA's Special Flood Hazard Area, including 723 residential properties. These properties were valued at more than $46.3 million and were exempt from having federally mandated insurance.

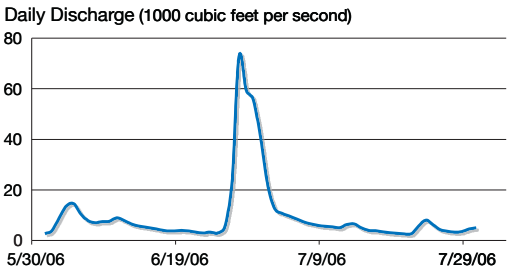
Despite the very rapid onset of the flood and the thousands of properties that were inundated, there were only four deaths, thanks to the Susquehanna River Basin's well-developed flood-response system. The area has an excellent

Distribution of Flood Risks in a Select Area in Broome County

(Properties flooded in 2006 relative to FEMA floodzone designation)



Water Level of the Susquehanna River at Conklin, during the June 2006 Flood



Days of very heavy rain on top of already saturated soils from weeks of rain caused a huge spike in the level of the Susquehanna River (chart above), flooding thousands of properties, including the Endicott sewage treatment plant (photo below).

warning-and-response system that links NOAA-based weather forecasts to real-time USGS streamflow data and coordinates with regional and local emergency response teams. The June 2006 response included pre-flood community-wide warnings and evacuations, water pumping and sand bag efforts, and emergency evacuations and medical services during the flood. Such a system is not inexpensive to operate: a single USGS gauge can cost nearly $20,000 per year to maintain and the system has nearly 10 such gauges. However, the value of such an early warning system is apparent when large floods do occur, and the system will remain important for the future.

While the area has extensive levees and dams, some are outdated and the current system is not adequate to deal with potential higher-magnitude floods. Development within the floodplains behind these barriers has intensified, making communities more vulnerable and damages greater when floods occur. Strategies to help further reduce flood risk include moving out of the highest risk areas with homeowner buyouts following floods, and relocating infrastructure, such as wastewater treatment plants, out of floodplains. This strategy was used successfully in Conklin and elsewhere. It reduces subsequent flood risk, both to lives and buildings, and monetary costs can be comparable to or less than costs to expand levees. It also expands natural flood-control processes by expanding the undeveloped areas so that floodwaters can spread out and dissipate instead of being forced downstream. In some areas, downstream flooding can also be lessened by reducing stormwater runoff through improving soil infiltration capacity, expanding vegetated surfaces, and decreasing impervious surfaces such as roads.

COASTAL ZONES

Context

New York's coastal zones are becoming more developed, further increasing the consequences of flooding, coastal erosion, and sea level rise.

More than a half million people live within the 100-year coastal floodplain in New York State.

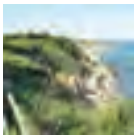
Coastal marshes and wetlands are highly sensitive and must maintain a delicate balance as they are affected by rapid sea level rise, wave erosion, sediment deposition, and other forces. These important ecosystems provide wildlife habitat, protect coastlines against storms, and absorb pollution.

Coastal impacts propagate into inland areas, such as up the Hudson River, all the way to the Troy Dam.

Key Climate Impacts

High water levels, strong winds, and heavy precipitation resulting from severe coastal storms already cause billions of dollars in damages and disrupt transportation and power distribution systems. Sea level rise will lead to more frequent and extensive coastal flooding. Warming ocean waters raise sea level through thermal expansion and have the potential to strengthen the most powerful storms.

Barrier islands are being dramatically altered by strong coastal storms as ocean waters overwash dunes, create new inlets, and erode beaches.



Sea level rise will greatly amplify risks to coastal populations and will lead to permanent inundation of low-lying areas, more frequent flooding by storm surges, and increased beach erosion.

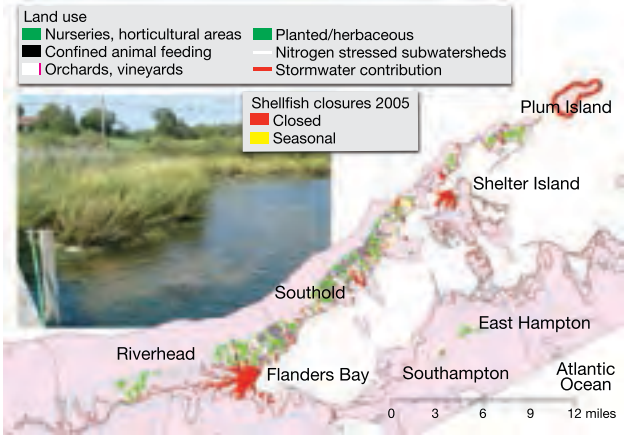
Loss of coastal wetlands reduces species diversity, including fish and shellfish populations.

Some marine species, such as lobsters, are moving north out of New York State, while other species, such as the blue claw crab, are increasing in the warmer waters.

Saltwater could reach farther up the Hudson River and into estuaries, contaminating water supplies. Tides and storm surges may propagate farther, increasing flood risk both near and far from the coast.

Sea level rise may become the dominant stressor acting on vulnerable salt marshes.

Land Use and Closures of Shellfish Harvesting



The impacts of climate change occur in the context of numerous other stresses, many of which are also caused by human activities. While climate change increases air and water temperatures and alters precipitation and runoff patterns, pollution from surrounding land use practices (such as sewage discharges and contaminated stormwater runoff from developed and agricultural areas) is an additional stress that harms fish and shellfish in the coastal zone. The map shows shellfish closures for the Peconic River Estuary in 2005 and the nearby land use practices that contribute to such closures.

Adaptation Options

Implementation of adaptation strategies in coastal zones is complicated by the complex interactions of natural and human systems and competing demands for resources.

Operations, Management, and Infrastructure Strategies

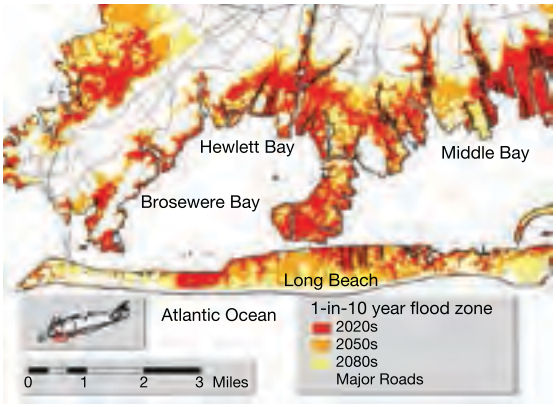
- Move sand onto beaches, although doing so can lead to habitat disruption and erosion in the area of removal, and is only a temporary solution. Add sediment from shipping channels to marshes, although this may not keep up with the rate of loss.
- Consider use of engineering-based strategies such as constructing or raising sea walls, and bio-engineered strategies including restoring or creating wetlands.
- Site new infrastructure and developments outside of future floodplains, taking into consideration the effects of sea level rise, erosion of barrier islands and coastlines, and wetland inundation.

Larger-scale Strategies

- Buy out land or perform land swaps to encourage people to move out of flood-prone areas and allow for wetlands to shift inland. Enact rolling easements to help protect coastal wetlands by prohibiting sea wall construction while still allowing some near-shore development.
- Improve building codes to promote storm-resistant structures and increase shoreline setbacks.

New York's highly developed and populated coastlines are vulnerable to severe coastal storms, such as hurricanes.

Projected Flooding



Projected flood map for 1-in-10 year storm event for Long Beach and surrounding bay communities for ClimAID rapid ice melt scenario.

Co-benefits

Protecting wetland areas has mitigation and other ecosystem service co-benefits because they provide critical functions such as capturing carbon, providing habitat for fish and other species, and serving as a buffer for storm surge.

Particularly Vulnerable Groups

Within the coastal zone, elderly and disabled residents and households without cars are particularly vulnerable to flood hazards as they have more difficulty evacuating in a timely manner.

Low-income populations living in coastal and near-coastal zones will be less able to recover from damages resulting from extreme weather events than will wealthier populations.

Racial and ethnic minorities are more vulnerable to extreme events than nonminority populations; African Americans and Latinos represent a significant portion of the people living in the New York City flood zone.

Coldwater marine species, such as lobsters, are vulnerable to increases in sea surface temperature, and some are already beginning to move north out of New York State waters.

Freshwater ecosystems in estuaries are vulnerable to saltwater intrusion as sea level rises.

COASTAL ZONES

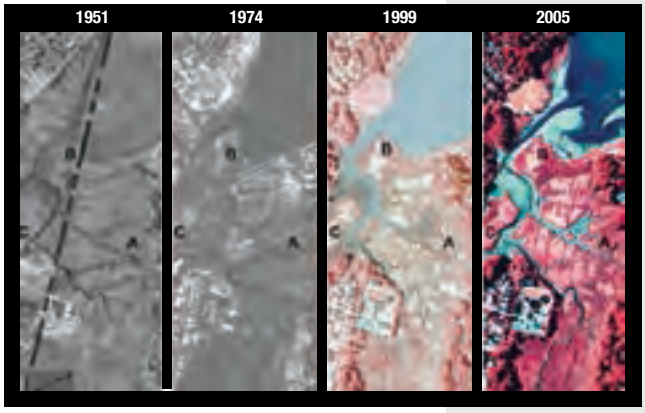
Effects of Sea Level Rise on Vital Coastal Wetlands

Salt marshes are essential ecosystems in New York State that provide a number of services including protection against coastal storm damage, habitat for migratory birds, nurseries for local fisheries, and recreation opportunities for residents. Over the past several decades, the area of these essential ecosystems has declined dramatically.

While sea level rise is currently a relatively minor component among several human-induced stressors (including draining of marshes, building sea walls, and dredging navigation channels) that may be contributing to the submergence and loss of vulnerable marshes, sea level rise may become the dominant factor in future decades.

At Jamaica Bay in New York City, island salt marsh area declined by 20 to 35 percent between the mid-1920s and mid-1970s. Since the mid-1970s, despite the implementation of regulations limiting dredging and filling activity, the rate of loss has accelerated: by 2008 close to 70 percent of the mid-1920s marsh area had been lost. In a 2003 pilot project at Big Egg Marsh, sediment was sprayed to a thickness of up to 3 feet and plugs of *Spartina alterniflora*, a marsh plant, were planted. In 2006 at Elder's Point East, a large-scale, $12 million restoration project used sand from maintenance dredging to artificially elevate the marsh. At both sites, the elevated stands of marsh plants are currently thriving. The successes of these two projects led to initiation of the 2010 restoration at Elder's Point West with plans underway for Yellow Bar Hassock.

Salt Marsh Loss Comparisons



Udalls Cove Park Preserve, Queens, NY

Udalls Cove Park in Queens and Pelham Bay Park in the Bronx have also experienced significant marsh loss. At Udalls Cove Park, marsh area has declined by 38 percent since 1974 and by 33 and 45 percent at two locations in Pelham Bay Park. Monitoring stations have been established in these parks to track the changes. The data are being used in combination with projected rates of sea level rise and aerial photographs to assist park managers, scientists, and public advocates in managing and thereby perhaps minimizing salt marsh loss in the coming decades.

Sea Level Rise and Severe Coastal Storms

Vulnerability of urban and suburban communities

New York's highly developed and populated coastlines are vulnerable to severe coastal storms, such as hurricanes. The urban and suburban regions of Long Beach and the communities along the mainland coastline of Great South Bay are two examples of areas at risk. Flood adaptation strategies for such areas require a holistic approach that promotes resiliency across communities.

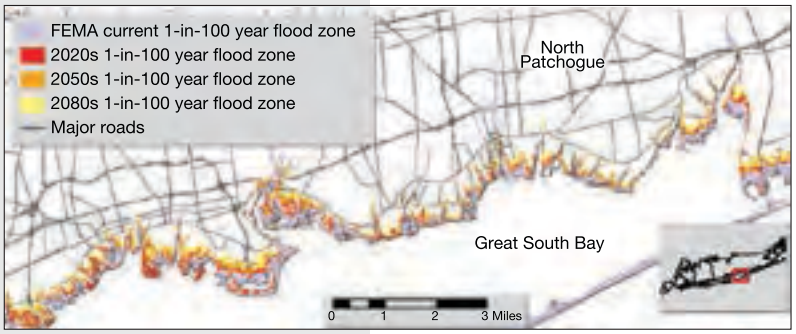
Sea level rise in combination with a coastal storm that currently occurs about once every 100 years on average is expected to place a growing population and more property at risk from flood and storm damage. In 2020, nearly 96,000 people in the Long Beach area alone may be at risk from sea level rise under the rapid ice melt scenario; by 2080, that number may rise to more than 114,500 people. The value of property at risk in the Long Beach area under this scenario ranges from about $6.4 billion in 2020 to about $7.2 billion in 2080.

To help protect against the effects of sea level rise and coastal storm flooding, a number of adaptation strategies could be undertaken. In terms of financial cost, relocating agricultural and low-density residential development further away from the coast may be an appropriate adaptation strategy. Engineering-based strategies, such as constructing levees and sea walls, can be appropriate for moderate- and high-density development, although they involve tradeoffs.

Each adaptation measure may create new patterns of winners and losers. For example, sea walls may protect some people within a community while others are left vulnerable to flooding. Sea walls also prevent wetlands from migrating inland, resulting in the loss of wetlands that are important nurseries for marine species and that also help protect the coastline from damage during storms. Relocating from high-risk coastal areas will put population pressures on some upland communities, potentially increasing property values and putting low-income people at a disadvantage. Such patterns of vulnerability need to be considered when planning for adaptation to reduce climate change impacts.

Sea level rise will lead to more frequent and extensive coastal flooding.

Flood Zone for a 1-in-100 Year Storm in Great South Bay



The map shows areas projected to be flooded in three future time periods based on projections from 7 global climate models, 3 emissions scenarios, and the rapid ice melt scenario used in ClimAID.

ECOSYSTEMS

Context

The vast majority of New York's forests and other natural landscapes are privately owned (more than 90 percent of the state's 15.8 million acres of potential timberland), with implications for land-use planning and policies.

Urbanization and other land-use changes have fragmented large, connected habitats important for species dispersal and migration.

Increasing deer populations cause economic losses to agricultural crops and urban landscapes, and their selective feeding in natural landscapes alters plant community structure with cascading effects on other species.

Many non-climate stressors currently have negative effects on New York's ecosystems. These stressors include invasive species, air pollution, acid precipitation, and excess nitrogen and phosphorus in the state's waterways.

Key Climate Impacts

Within the next several decades, New York State is likely to see widespread shifts in species composition in the state's forests and other natural landscapes, with the loss of spruce-fir forests, alpine tundra, and boreal plant communities.

Climate change will favor the expansion of some invasive species into New York, such as kudzu, an agressive weed, and the hemlock woolly adelgid, an insect pest. Some habitat and food generalists (such as white-tailed deer) may also benefit.

A longer growing season and the potential fertilization effect of increasing carbon dioxide could increase the productivity of some hardwood tree species, provided growth is not limited by other factors such as drought or nutrient deficiency.

Carbon dioxide fertilization tends to preferentially increase the growth rate of fast-growing species, which are often weeds and other invasives.

Lakes, streams, inland wetlands, and associated aquatic species will be highly vulnerable to changes in the timing, supply, and intensity of rainfall and snowmelt, groundwater recharge, and duration of ice cover.

Increasing water temperatures will negatively affect brook trout and other native coldwater fish.

Adaptation Options

New York's state fish, the brook trout, is at particular risk from hemlock loss and is already at risk from increasing temperatures.

When considering adaptation strategies for ecosystems, it is important to manage primarily for vital ecosystem services and biodiversity rather than attempting to maintain the current mix of species.

Operations, Management, and Infrastructure Strategies

- Develop management interventions to reduce vulnerability of high-priority species and communities, and determine minimum area needed to maintain boreal or other threatened ecosystems.

Larger-scale Strategies

- Maintain healthy ecosystems so they are more tolerant or better able to adapt to climate change by minimizing other stressors such as pollution, invasive species, and sprawl and other habitat-destroying forces.
- Facilitate natural adaptation by protecting riparian zones and migration corridors for species adjusting to climate changes.
- Institutionalize a comprehensive and coordinated monitoring effort and accessible database to track species range shifts and other indicators of habitat and ecosystem response to climate change. Identifying and prioritizing what to monitor and, in some cases, developing new indicators will be required.

Co-benefits

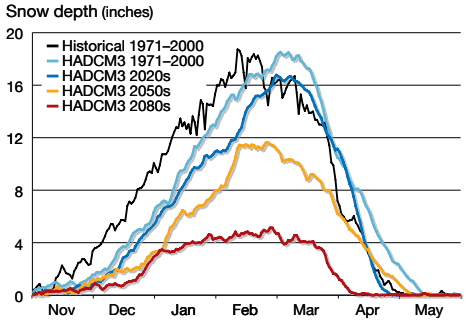
Maintaining healthy ecosystems in a changing climate will allow them to continue to provide services such as provision of water resources, maintenance of biodiversity, and recreation.

Ecosystem Services

Healthy ecosystems are our life support system, providing us with essential goods and services that would be extremely expensive or impossible to replace. Ecosystems purify air and water, and provide flood control. They supply us with products like food and timber, and sequester carbon and build soils. They provide recreation, hunting and fishing, and wild places in which to enjoy nature. Human disruption of ecosystems, through climate change and other factors such as habitat destruction and pollution, can reduce ecosystems' ability to provide us with these valuable services.

ECOSYSTEMS

Seasonal Snow Depth at Wanakena (Adirondacks)



Snowpack is projected to decline sharply due to future warming. The black line shows historical snowpack, and the colored lines show projected snowpack over the months with snow for three future time periods under one relatively high emissions scenario (A2) using one global climate model, UK Met Office Hadley Centre Model version 3 (HadCM3). These projections are broadly consistent with those of other models used in ClimAID.

Bobcat

Snowshoe Hare

Particularly Vulnerable Groups

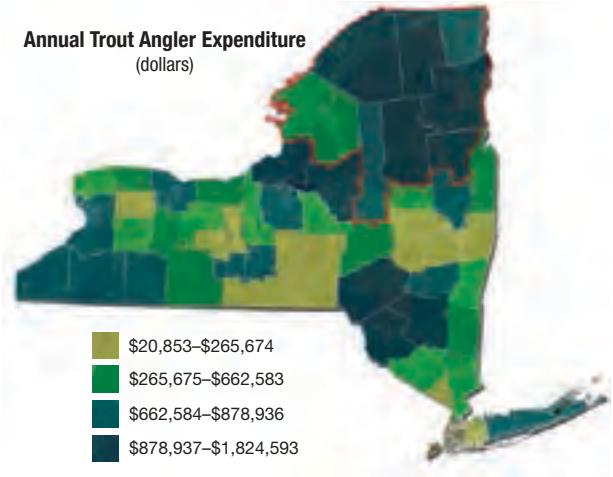
Communities whose economies depend on skiing and snowmobiling will be negatively affected by higher temperatures and reduced snowpack.

Communities that depend on tourism associated with coldwater fisheries such as trout could be particularly vulnerable, although there could be increases in warmer water fish species such as bass that could help offset these losses.

Characteristics that make species and communities highly vulnerable to climate change include: being adapted to cold or high-elevation conditions; being near the southern boundary of their ranges; having a narrow range of temperature tolerance; having specialized habitat or food requirements; being susceptible to new competitors, invasive species, or pests; having poor dispersal ability; having low genetic diversity; and having low population levels.

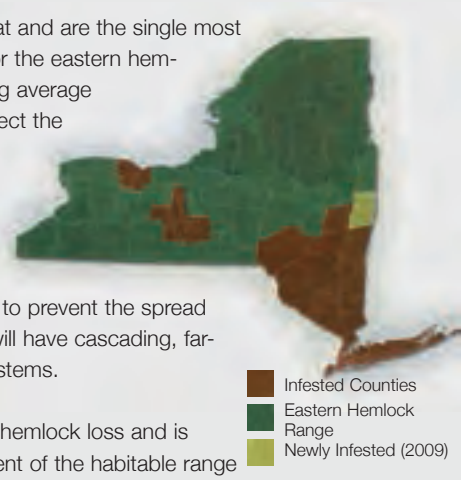
Vulnerable species and ecosystems include: spruce-fir forests of the Adirondack and Catskill mountains; boreal and alpine tundra communities of the Adirondack mountains; hemlock forests; brook trout, Atlantic salmon, and other coldwater fish; snow-dependent species such as snowshoe hare, voles, and other rodents, and their winter predators such as fox and bobcat; moose; bird species such as Baltimore oriole and rose-breasted grosbeak; amphibians and other wetland species.

Annual Trout Angler Expenditure
(dollars)



Cascading Effects of Climate Change on Animals, Plants, and the Economy

Shaded and cool hemlock forests provide unique wildlife habitat and are the single most prevalent conifer species in New York State. Suitable habitat for the eastern hemlock is expected to decline in New York as a result of increasing average summer temperatures as well as the spread of the invasive insect the hemlock woolly adelgid. The hemlock woolly adelgid is already well established in New York and recently has spread to the central part of the state, in part due to rising winter temperatures that are allowing the insect to survive the winter. Hemlocks already are dying from infestations in New York's southern and Hudson Valley regions. Currently there is no way to prevent the spread or the effects of the insect. Extensive loss of hemlock forests will have cascading, far-reaching effects on a variety of wildlife species and their ecosystems.



New York's state fish, the brook trout, is at particular risk from hemlock loss and is already at risk from increasing temperatures. The southern extent of the habitable range for brook trout is in New York and the historical abundance of the fish is likely to be severely reduced by warming. Brook trout depend on coldwater refuges in streams and lakes to survive. Lakes that become unstratified will lack coldwater refuges and are likely to lose all of their trout. These represent about 41 percent of brook trout lakes in the Adirondack Mountains, for example. Brook trout in streams and rivers will also be vulnerable as water temperatures rise along with air temperatures. Their vulnerability will be complicated by the extensive loss of hemlock forests, which shade and maintain lower water temperatures in streams.

The loss of brook trout will cause changes in New York's fishing economy and may have disproportionate effects on small, fishing-dependent communities in which millions of dollars are spent by tourists who come to fish for trout. Possible adaptation strategies for keeping steams cool enough for brook trout include maintaining or increasing vegetation that provides shade along rivers, streams, and lake shorelines, and minimizing disturbances that would impede water flows and groundwater inputs.

Even more important from an economic perspective are the broader impacts of climate change on mountain forests. The local economies of the Adirondacks, Catskills, and Finger Lakes are dominated by tourism and recreation. Two-thirds of the current tree species in mountainous areas of the Adirondacks are projected to be outside of their sustainable climate zone and in severe decline by the end of this century if current emissions trends continue.

Hunting, fishing, and wildlife viewing make significant contributions to New York State's economy. More than 4.6 million people fish, hunt, or wildlife watch in the state, spending $3.5 billion annually on equipment, trip-related expenditures, licenses, contributions, land ownership and leasing, and other items. The loss of spruce-fir forests and alpine meadows will negatively affect these experiences and their economic contributions to the state.

Winter recreation is another major component of the economic value of the state's natural ecosystems. New York has more ski areas than any other state, hosting an average of 4 million visitors each year, contributing $1 billion to the state's economy, and employing 10,000 people. New York is also part of a six-state network of snowmobile trails that totals 40,500 miles and contributes $3 billion each year to the Northeast regional economy. Shorter, warmer winters and reduced snowpack will have significant negative impacts on winter recreation in the state and the region.

AGRICULTURE

Context

The agriculture sector in New York State encompasses more than 34,000 farms that occupy about one-quarter of the state's land area (more than 7.5 million acres) and contribute $4.5 billion annually to the state's economy.

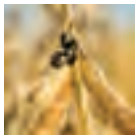
A large majority of New York agriculture is currently rain-fed without irrigation, but summer precipitation is currently not sufficient to fully meet crop water needs most years.

Economic pressures have led to consolidation into fewer, larger farms, particularly in the dairy industry. The costs of adapting to climate change may intensify this trend.

Agriculture is sensitive to the volatile and rising costs of energy, a challenge that climate change is likely to exacerbate.

Key Climate Impacts

Increased summer heat stress will negatively affect cool-season crops and livestock unless farmers take adaptive measures such as shifting to more heat-tolerant crop varieties and improving cooling capacity of livestock facilities.



Increased weed and pest pressure associated with longer growing seasons and warmer winters will be an increasingly important challenge.

Water management will be a more serious challenge for New York farmers in the future due to increased frequency of heavy rainfall events, and more frequent and intense summer water deficits by mid to late century.

Opportunities to explore new crops, new varieties, and new markets will come with higher temperatures and a longer growing season.

Early season produce can provide a large fraction of a farmer's income. Heavy downpours can delay spring planting and/or damage crops, greatly reducing this important source of revenue.

Adaptation Options

A changing climate presents challenges and potential opportunities for New York State farmers. Responding will necessitate both on-farm and state-level strategies.

Operations, Management, and Infrastructure Strategies

- Change planting dates, varieties, or crops grown.
- Increase farm diversification.
- Improve cooling capacity, including the use of fans and sprinklers in dairy barns.
- Increase control of pests, pathogens, and weeds and use new approaches to minimize chemical inputs.
- Develop new crop varieties for projected New York climate and market opportunities.
- Invest in irrigation and/or drainage systems.

Larger-scale Strategies

- Develop decision tools to assist farmers in determining the optimum timing and magnitude of investments to cope with climate change.

Co-benefits

There are several opportunities for reducing greenhouse gas emissions with agriculture adaptation options, including improved manure management, generation of on-site energy, increasing the use of soil organic matter, and using nitrogen fertilizer more efficiently.

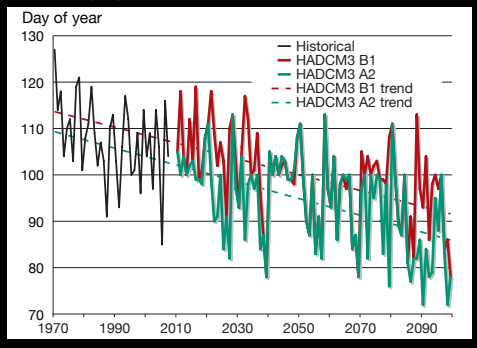
Changes for the grape industry

New York's grape harvest ranked third in the nation in 2007, with the crop valued at nearly 50 million dollars. In recent years, however, challenges associated with cold injury to crops have cost the state's agriculture industry millions of dollars. Increasing temperatures at the beginning of winter reduce cold hardiness and can raise the probability of midwinter damage. In late winter or early spring (after the winter-chilling requirement has been met), an earlier arrival of spring or a prolonged warm period may lead to premature budding and increased vulnerability to spring frost. Projections indicate a slight increase in the potential for spring frost injury in Concord grapes.

In the long term, warmer winters and a longer growing season may bring opportunities to introduce a wider range of high-value, less cold-tolerant European red wine grape varieties such as Cabernet Sauvignon and Zinfandel, that currently are constrained by the state's climate.

Adaptation strategies to avoid damage from spring frost events (such as using wind machines that pull warmer air down from high above ground during temperature inversions, and changing pruning and mulching strategies) are well established. New research will be required to integrate weather forecasts into early-warning systems for extreme events such as hard freeze and spring frost events. Linking these warning systems to the susceptibility of crops to damage could help reduce losses.

Changing Date of the Day of Last Frost



As climate warms, the date of last frost comes ever earlier in the year. The chart shows the date of last frost as the number of days after January 1. The black line shows observations. The red line shows a model projection (HadCM3) based on a lower emissions scenario (B1) while the green line shows that model's projection based on a higher emissions scenario (A2). Higher emissions mean more warming and hence cause the last frost day to occur even earlier in the year. This model's projections are broadly consistent with those of the other models used in ClimAID.

AGRICULTURE

Particularly Vulnerable Groups

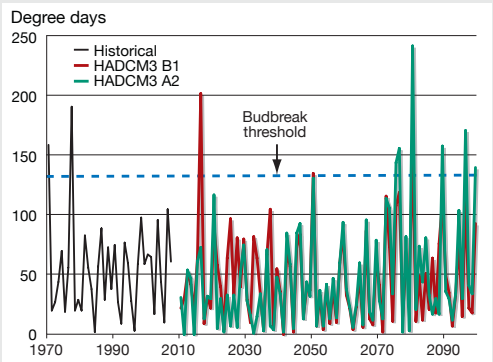
Dairy milk production and the productivity and/or quality of some cool-season crops such as apples, potatoes, and cabbage will be particularly vulnerable to increases in summer heat stress. Adaptations such as improving cooling capacity of dairy barns or changing varieties or crops are straightforward but will not be cost-free or risk-free. For example, the state could lose some favorite varieties of apples, such as McIntosh and Empire, for which it currently has national recognition, and have to replace them with more heat-tolerant varieties.

Smaller farms may have less information and training and less capital to invest in adaptation strategies such as stress-tolerant plant varieties, increased chemical and water inputs, and enhanced livestock cooling. By adding to already severe competitive pressure, climate change is likely to exacerbate current trends towards consolidation into fewer, larger farms, especially in the dairy sector.

Farms specializing in cool-season crops may have challenges finding appropriate new varieties that meet both production demands and market expectations.

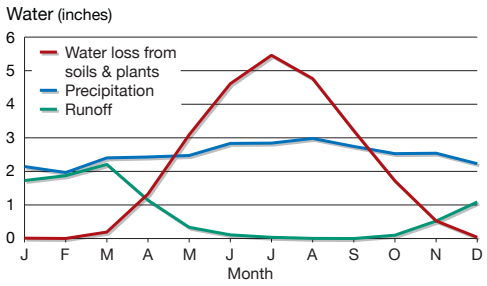
Without proactive development of non-chemical approaches, increased pesticide and fertilizer use could harm sensitive environments, such as streams and rivers.

Projected Degree Days above 60ºF Prior to Last Frost



As temperatures rise, plants flower earlier in the spring. This can make them more vulnerable to damage from late spring frost. Climate change has the potential to exacerbate this vulnerability in Concord grapes grown in New York State. The dotted blue line represents a cumulative degree-day threshold that would lead to bud break prior to the last spring frost for Concord grapes in the Fredonia region. Years exceeding the threshold would have a high risk of frost damage. As the chart shows, under a higher emissions scenarios (A2, green line), this is projected to happen much more frequently in the later part of this century. These results are broadly consistent with the other global climate models used in ClimAID.

Seasonal Differences in Soil-Water Balance



The chart shows historical averages for each month of the year for precipitation, evaporative water loss from soils and plants, and runoff. Runoff is the fraction of precipitation that is not evaporated and exceeds the soil-holding capacity and thus passes into deep groundwater or into streams. The red line shows that there is a moisture deficit in summertime as evaporative losses increase due to higher temperatures, resulting in virtually no runoff during the warmest months. ClimAID projections show that both the summer deficit and winter excess are expected to increase in a warming climate.

Dairy Heat Stress

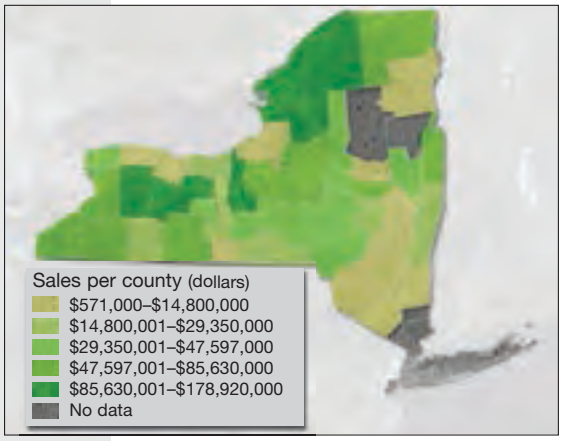
Heat stress has both short- and long-term effects on the health and performance of dairy cattle, depending on severity and timing of the stress. Short-term impacts include decreases in feed intake and milk production. Under heat stress, cows spend less time resting and more time standing and walking. A decrease of 1 hour of resting time is associated with a decrease of 2 to 3 pounds of milk produced per cow. Severe heat stress can cause lameness and poor reproductive performance (calving), with subsequent long-term negative effects on milk production. While short-term responses can be partially reversed after a heat wave, long-term effects are less easily reversed.

By the 2080s, the magnitude of annual N.Y. milk production decline associated with heat stress is projected to increase six-fold compared to current heat stress-related declines. Economic losses associated with the projected increase in heat stress range from $37 to $66 per cow per year. These ClimAID estimates took into account only short-term heat stress effects. They did not consider the potential long-term effects of severe stress on milk production, so they may underestimate losses.

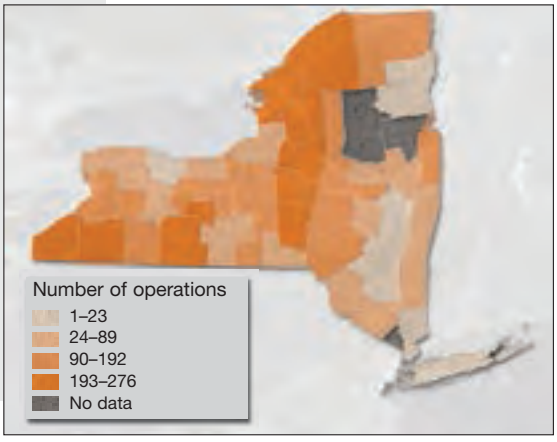
Modifying feeding and providing adequate water can help reduce heat stress in cows but cannot substitute for improving cooling capacity in dairy barns (for example, through improved ventilation, high airspeeds directly over the cows, and sprinkler systems). Many ventilation systems are inherently more cost-effective when deployed for larger barns. Small farms that cannot afford these kinds of adaptation measures will be most vulnerable to the impacts of warming.

By the 2080s, the magnitude of annual N.Y. milk production decline associated with heat stress is projected to increase six-fold compared to current heat stress-related declines.

Variations in Dairy Sales



Distribution of Dairy Operations



ENERGY

Context

The energy system in New York State is designed to cope with a wide range of climate variability.

Climate change is likely to exacerbate existing risks rather than create new ones.

Extreme, short-term weather events and changes in demand are particularly important to the energy industry.

The state's annual electricity load has increased by about 4.3 percent per year. New York City and Long Island account for about half of the total demand.

New York State's electricity sources vary regionally. For example, many fossil-fuel-fired plants are in New York City and Long Island while most of the state's hydropower is in western, central, and northern New York.

Wind power deployment is expected to increase across the state.

Natural gas is the most commonly used source of heating energy in buildings, although there are strong regional differences, which reflect the lack of gas service in many parts of the state.

Energy prices vary widely, with higher prices in eastern New York than in western parts of the state.

Key Climate Impacts

Impacts of climate change on energy demand are likely to be more significant than impacts on supply. Climate change will adversely affect system operations, increase the difficulty of ensuring adequate supply during peak demand periods, and worsen problematic conditions, such as the urban heat island effect.

More frequent heat waves will cause an increase in the use of air conditioning, stressing power supplies and increasing peak demand loads.

Increased air and water temperatures will decrease the efficiency of power plants, as they decrease cooling capacity.

Coastal infrastructure is vulnerable to flooding as a result of sea level rise and coastal storms.

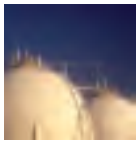
Hydropower is vulnerable to projected increases in summer drought.

The availability and reliability of solar power systems are vulnerable to changes in cloud cover, although this may be offset by advances in technology; wind power systems are similarly vulnerable to changes in wind speed and direction.

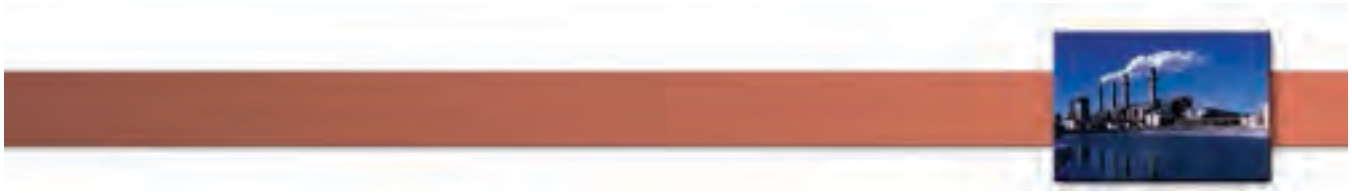
Biomass energy availability depends on weather conditions during the growing season, which will be affected by a changing climate.

Transformers and distribution lines for both electric and gas supply are vulnerable to extreme weather events, such as heat waves and flooding.

Higher winter temperatures are expected to decrease winter heating demand, which will primarily affect natural gas markets, while increases in cooling demand will affect electricity markets; such changes will vary regionally.



The indirect financial impacts of climate change on the energy sector may be greater than the direct impacts of climate change. These indirect impacts include those to investors and insurance companies as infrastructure becomes more vulnerable and those borne by consumers due to changing energy prices and the need to use more energy.



Adaptation Options

Planning for climate change must balance the need to make energy systems more resilient with the cost of such investments and changes. One way to do this is to incorporate adaptation planning into the replacement cycles of system assets, which have a long but relatively fixed lifespan. As temperatures rise, it will be even more important to encourage the use of energy efficient cooling methods such as shading buildings and windows or using green roofs and highly reflective roof paints to reduce buildings' temperatures. Although demand-side management, which encourages consumers to use energy more efficiently, is already a key state policy, it could be made an even greater priority.

Operations, Management, and Infrastructure Strategies

- Use transformers and wiring that function efficiently at higher temperatures.
- Construct berms and levees to protect infrastructure from flooding; install saltwater-resistant transformers to protect against sea level rise and saltwater intrusion.
- Review and revise tree trimming practices to account for changes in vegetation due to climate change.

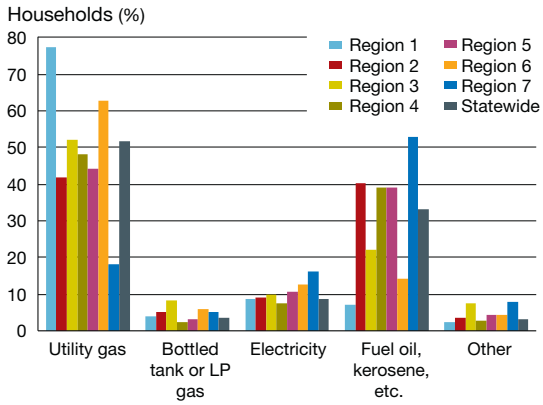
Larger-scale Strategies

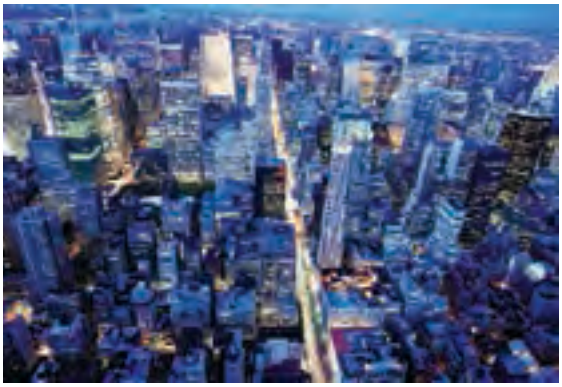
- Adjust reservoir release policies to ensure sufficient summer hydropower capacity.
- Improve energy efficiency in areas that are likely to have the largest increases in demand.

Co-benefits

Increasing energy efficiency can help people to adapt to higher temperatures while reducing greenhouse gas emissions in order to mitigate climate change.

Fuels Used for Residential Heating in New York State by ClimAID Region



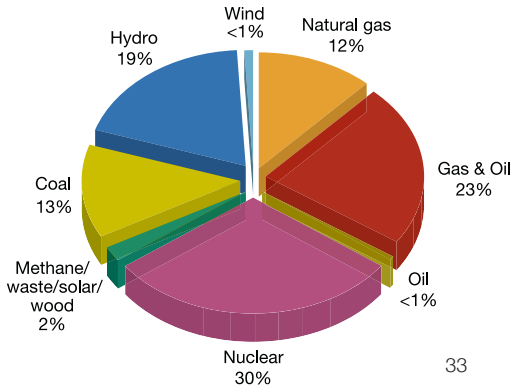


Projected Changes in Peak Electricity Demand for Heating and Cooling, 2020s (compared to current peak demand)

Weather Station	Heating Season **Decrease** in MWp Electricity Demand in 2020s	Cooling Season **Increase** in MWp Electricity Demand in 2020s
Buffalo	14–27	55–111
Rochester	9–18	53–105
Syracuse	19–37	61–122
Massena	5–10	7–15
Watertown	11–21	29–57
Albany	15–29	63–126
Poughkeepsie	12–25	72–145
NY City (LGA)	40–80	249–497
Islip	27–58	194–387

ClimAID global climate models project that average annual temperature will rise by 1.5 to 3.0°F in the 2020s compared to the 1970–1999 baseline period. An analysis of the sensitivity of energy demand to these changes shows that while heating energy use will decrease slightly, cooling energy use will increase much more.

New York State Electricity Generation by Fuel Type, 2008



ENERGY

Particularly Vulnerable Groups

For lower-income residents, increased energy costs associated with air conditioning may be difficult to afford.

Low-income residents living in urban areas, which are already subject to urban heat island effects, may be especially vulnerable to higher energy costs.

New energy facilities to power the increased demand for air conditioning may place burdens on communities located nearby.

Elderly, disabled, and health-compromised residents are especially vulnerable to energy outages associated with extreme climate events.

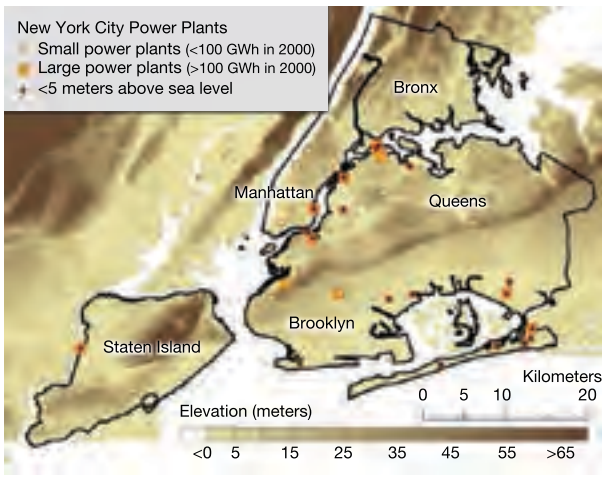
Impacts of Extreme Heat in Cities

Sustained high temperatures contribute to increased energy usage during heat waves, primarily for cooling indoor space and industrial equipment. When high temperatures persist overnight during these extended heat events, the likelihood of outages increases. While the network design of local grids tends to isolate outages geographically, limiting the number of customers affected, prolonged heat waves can cause multiple outages across a city. The impacts of power outages can extend well beyond the energy sector, affecting health, transportation, and telecommunication.

In New York City, urban heat island effects already contribute to an increase in energy demand during hot summer periods. Worsening heat waves under climate change pose a challenge for the city's energy sector. Existing urban heat island patterns may become more intense, such that areas that are already warmer due to heat island effects may become relatively hotter during a heat wave. The effects of heat islands are especially prominent in many lower income neighborhoods, such as Fordham in the Bronx and Crown Heights in Brooklyn. These neighborhoods often have fewer trees on the street and higher building density, both of which contribute to hotter conditions.

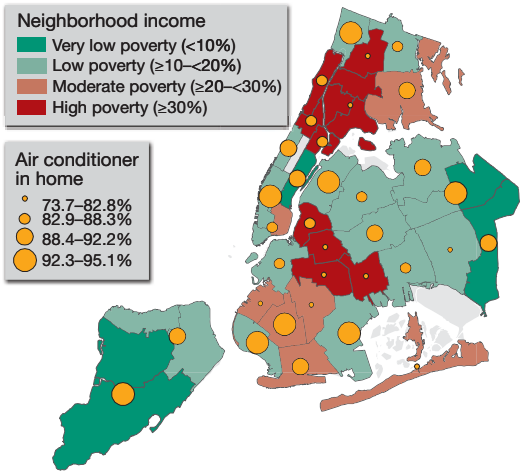
Higher poverty areas of New York City, particularly in northern Manhattan, the South Bronx, and parts of Brooklyn, have lower rates of home air conditioning than other areas, putting them at greater risk for heat-related health problems. But even households that have air conditioning in these areas may be reluctant to use it because of the high cost of energy, which represents a large portion of their household income.

Location and Elevation of Power Plants in New York City



The majority of New York City's power plants are located at low elevations on the coast and are thus vulnerable to sea level rise and storm surge.

Air Conditioning Distribution and Neighborhood Level Poverty



Neighborhoods with higher poverty rates, including Central Harlem, Washington Heights, Fordham, the South Bronx, Greenpoint, Williamsburg, Bedford-Stuyvesant, and others, have lower rates of in-home air conditioning than more affluent parts of the city.

To provide enough power during heat waves to meet the increase in peak demand, less efficient and more highly polluting sources of power may be used. High ozone levels due to the combination of high temperatures and air pollution are particularly harmful for the elderly and ill.

Power outages and other disruptions to supply have significant financial impacts, with costs to U.S. consumers ranging from $119 billion to $188 billion per year. The workforce—especially those living farther from their jobs or who are more dependent on forms of transportation that become inoperable during power outages—are likely to bear these losses. During the 2003 Northeast blackout, loss of wages was estimated to account for two-thirds of the total financial losses.

Those providing emergency services, including emergency health professionals, also may have difficulty getting to work during a power outage, thereby increasing risks to individuals in need of assistance. During the 2003 Northeast blackout, the health services sector had the second highest workforce losses as a result of business closures. Demand for emergency services during the outage increased significantly as did the rate of respiratory device failure.

To protect against severe power outages, smart grid technology can be used to help avoid them altogether by providing network operators with clearer metrics of the potential risk. Reducing demand and distributed generation (which generates electricity from many small sources) can also help lessen the risk of power outages. During heat waves and in advance of peak demand, voluntary and mandatory load-reduction programs that call for customers to reduce usage also can be employed.

TRANSPORTATION

Context

New York State is home to a 113,000-mile network of Interstate and State Highways including 16,000 bridges, a 4,600-mile rail network including the largest mass transit system in the U.S., some 500 public and private aviation facilities, more than 130 public transit operators, four port authorities, and numerous private ports. Transportation contributes about 10 percent, or $100 billion annually, to the state's economy.

The highest concentration of transportation infrastructure is generally located in regions that are population centers and vital drivers of the global, national, and state economy. Threats to these dense metropolitan transportation systems (especially New York City) would have far-reaching impacts.

Ground transportation systems (roads and rails) in coastal population centers are often placed underground in tunnels very close to or below sea level.

Since transportation is a networked system, delays and failures in one part can affect other parts.

Key Climate Impacts

Over the next few decades, heat waves and heavy precipitation events are likely to dominate the causes for moderate, more frequent transportation problems such as flooded streets and delays in mass transit.

By later this century, it is very likely that coastal flooding will be more frequent and intense due to sea level rise. Major adaptations are likely to be needed, not only in the coastal zones, but also in Troy and Albany as sea level rise and storm surge propagate up the tide-controlled Hudson River.

Materials used in transportation infrastructure, such as asphalt and train rails, are vulnerable to increased temperatures and frequency of extreme heat events.

Air conditioning requirements in buses, trucks, and trains, and ventilation requirements for tunnels will increase.

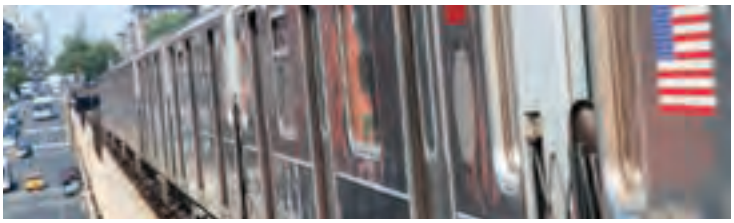
Low-lying transportation systems such as subways and tunnels, especially in coastal and near-coastal areas, are at particular risk of flooding as a result of sea level rise, storm surge, and heavy precipitation events.

Transportation systems are vulnerable to ice and snowstorms, although requirements for salting and snow removal may decrease as precipitation tends to occur more often as rain than snow. Freeze/thaw cycles that disturb roadbeds may increase in some regions as winter temperatures rise.

Runways may need to be lengthened in some locations since hotter air provides less lift and hence requires higher speeds for take off. Newer, more powerful aircraft can reduce this potential impact.

The Great Lakes may see a shorter season of winter ice cover, leading to a longer shipping season. However, reduced ice cover may result in an increase in "lake effect" snow events, which cause various transportation-related problems.

New York State has the most days per year of freezing rain in the nation. This affects air and ground transportation directly and also indirectly through electric and communication outages. It is unknown how climate change will influence the frequency of freezing rain in the future.



Adaptation Options

Disaster management studies have shown that every $1 invested in preventative measures saves $4 in losses not incurred.

Operations, Management, and Infrastructure Strategies

- Perform engineering-based risk assessments of assets and operations and complete adaptation plans based on these assessments, including financing.
- Protect coastal transportation infrastructure with levees, sea walls, and pumping facilities; elevate bridge landings, roads, railroads, airports, and collision fenders on bridge foundations; design innovative gates at subway, rail, and road tunnel entrances and ventilation openings.
- Relocate critical systems to higher ground out of future flood zones.
- Lengthen airport runways and expansion joints on bridges; upgrade to energy-efficient air conditioning on trains, subways, and buses; use heat-resistant construction materials for pavements and rail tracks.

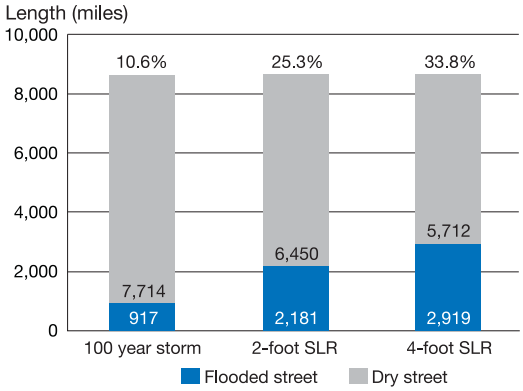
Larger-scale Strategies

- Change standards for engineering specifications related to climate such as for heat-resistant materials and the capacity of drainage systems.
- Form alliances to set performance standards to reduce climate risks; form mutual insurance pools that spread risks.

Co-benefits

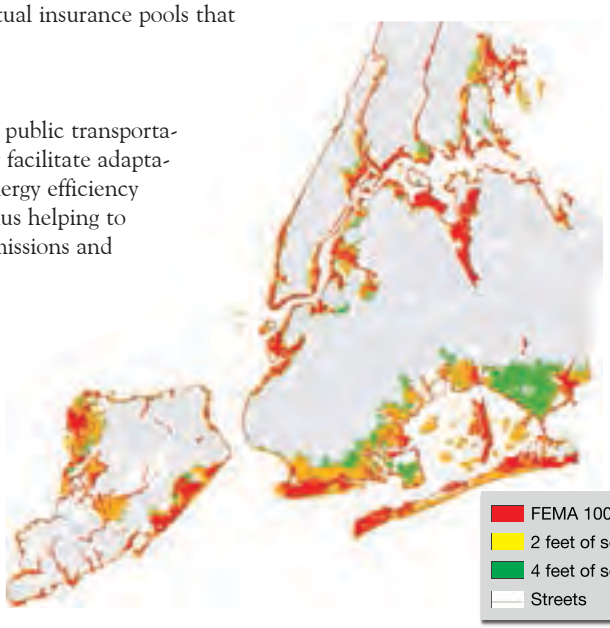
Making improvements to public transportation systems will not only facilitate adaptation, but also enhance energy efficiency and increase ridership, thus helping to reduce greenhouse gas emissions and mitigate climate change.

NY City Streets at Risk of Flooding



As sea level rises, many more New York City streets will be at risk of flooding. The chart shows the total length in miles of NY City streets at risk of flooding under current sea level with a 100-year storm, and with 2 feet and 4 feet of sea level rise (consistent with the ClimAID projections). Under current conditions, about 11 percent of city streets are at risk. With 2 feet of sea level rise, that increases to about 25 percent. And with 4 feet of sea level rise, about 34 percent of NY City streets are at risk.

New York City's Expanding Flood Zones



100-year flood zones for the New York City area under observed conditions (red, from FEMA); and for a sea level rise of 2 feet (yellow), and of 4 feet (green). These sea level rise scenarios are consistent with the ClimAID projections.

TRANSPORTATION

Particularly Vulnerable Groups

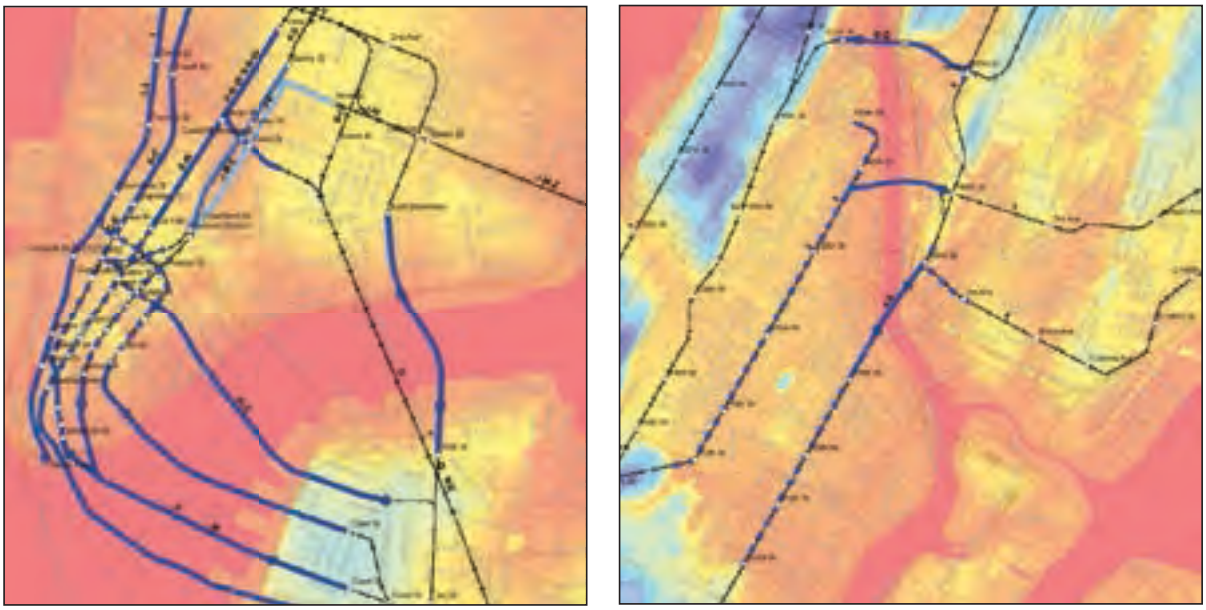
Low-income and elderly populations, especially in urban areas, are particularly vulnerable to disruption to transportation services, limiting their ability to get to work or evacuate during emergencies and extreme weather events.

Transport interruptions take a particular toll on working women, who tend to have less spare time because of child and family care and on average earn less than men.

Workers on hourly payrolls can less afford transportation-related work loss or delays compared to more affluent, salaried employees whose pay does not depend on the number of hours worked.

Lower income neighborhoods, whether rural, suburban, or urban, generally have already poor transportation options and little or no redundancy. Increases in extreme events will worsen their situation.

100-year Flood with 4-foot Sea Level Rise



A 100-year flood with a 4-foot rise in sea level (consistent with the ClimAID rapid ice melt scenario projections in the 2080s) would flood a large fraction of Manhattan subways, including virtually all of the tunnels crossing into the Bronx beneath the Harlem River (above right) and the tunnels under the East River (above left). Blue lines on the maps show flooded subway lines and tunnels. Background colors indicate topography, with areas greater than 30 feet in elevation in yellow. Since subway tracks are typically 20 feet below the street level, areas in yellow could avoid flooding given the ClimAID storm surge and sea level rise projections.

Sea Level Rise and a 100-year Coastal Storm

Impacts on New York City metropolitan area

Sea level rise in combination with coastal storm surge has the ability to severely damage transportation systems in New York—particularly those in New York City and the surrounding metropolitan region—since much of the systems are located at low elevations, and some in tunnels below sea level. By the end of this century, the ClimAID projections show that sea level is expected to rise by 2 to 4 feet with significant implications for the transportation sector.

Damages from a coastal storm in the New York City metropolitan area that currently occurs on average once every 100 years would be significant. At current sea level, economic losses from such a storm would amount to about $58 billion. Losses under a 2-foot sea level rise scenario increase to $70 billion and to $84 billion under a 4-foot sea level rise scenario. All sectors of the transportation system would be affected, including roads, railways, subways, airports, and seaports.

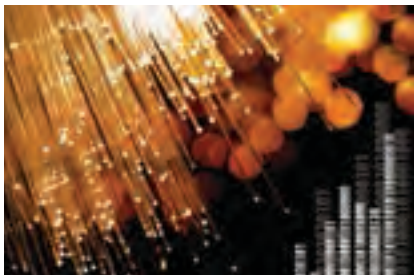
The effects of such a flooding scenario would occur rapidly. For example, many of the tunnels lying below flood heights (including subway, highway, and rail) would fill up with water in less than 1 hour. At the low-lying La Guardia Airport, sea level rise would wipe out the effectiveness of existing levees, even for less severe storms. The outage times estimated for the various transportation systems range from 1 to 29 days, depending on the infrastructure and sea level rise scenario. More detailed engineering-based vulnerability assessments are needed to improve these preliminary estimates.

The social and economic effects of a 100-year storm would not be distributed evenly. People with limited mobility and transportation options would be affected the most, including low-income households, the disabled, and the elderly. These populations also may be less likely to access relief from centralized facilities located beyond walking distance.

To protect against the impacts of a 100-year storm, sea walls, floodgates, and pumping stations could be constructed in the short term. In the long term, transportation infrastructure could be relocated to higher elevation areas, outside of the future floodplain, and some tunnel structures could be outfitted with engineered flood protection. The sustainability of a proposed barrier system to protect the New York harbor has not been established and requires careful cost/benefit assessments of long-term risks and of exit strategies when prolonged sea level rise combined with coastal storm surge begins to exceed the finite design elevations of any such barrier system.

Annualized losses from the expected climate hazards for the metropolitan transportation systems are estimated in the hundreds of millions of dollars per year now, increasing to billions of dollars per year by mid-century. Required annual capital costs to make the transportation systems resilient to climate hazards in this coastal setting are on the order of one quarter of the expected losses that are estimated to occur if no protective adaptation measures were undertaken. Therefore preventive measures are likely to be highly cost-effective, but require engineering assessments and must be in place before irreparable flood damage occurs. This will require capital investments.

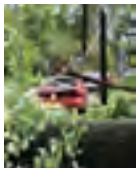
TELECOMMUNICATIONS



Key Climate Impacts

Communication service delivery is vulnerable to hurricanes, lightning, ice, snow, wind storms, and other extreme weather events, some of which are projected to change in frequency and/or intensity.

The delivery of telecommunication services is sensitive to power outages, such as those resulting from the increased demand associated with heat waves, which are expected to increase with climate change.



Communication lines and other infrastructure are vulnerable to heavy precipitation events, flooding, and/or freezing rain.

In coastal and near-coastal areas, sea level rise in combination with coastal storm surge flooding will be a considerable threat later this century.

Context

Telecommunications infrastructure is vital to New York State's economy and welfare; its capacity and reliability are essential to the effective functioning of emergency services as well as global commerce and the state's economy.

The sector is largely privately operated, but it has important public functions.

Because of rapidly changing telecommunications technology and deregulated, fiercely competitive markets, some operators often focus on short-term market share and profitability rather than pursuing long-term strategies to achieve reliability and redundancy.

Under current climate conditions and severe weather events, there are already serious vulnerabilities that in many instances prevent the telecommunications sector from delivering services to the public. If the sector could be made more resilient to the current climate, then the incremental threat from climate change is likely to be more manageable.

The sector is tightly coupled to the energy sector, with power outages affecting the reliability of communication services; many of its communication lines also are located on the same poles as power lines.

Modern digital technologies, including telecommunication services based on fiber optics, broadband, and the Internet, can be more vulnerable to power outages than traditional landline technology that was—or in some places still is—self-powered.

Wireless mobile phone services and landlines often share the same backbone network. In these instances, redundancy is essential to avoid simultaneous breakdowns.

Reports of service outages to federal or state regulators are not accessible to the public and are not uniformly mandatory across the different types of services.

Adaptation Options

Changes to telecommunications infrastructure to make it more robust, resilient, and redundant will reduce future climate-related outages.

Operations, Management, and Infrastructure Strategies

- Trim trees near communication lines; place communication cables underground where technically and economically feasible.
- Provide backup power at cell towers with generators, solar-powered battery banks, and "cells on wheels" that can replace disabled towers. Extend the fuel storage capacity to run back-up generators for extended times.
- Relocate central communications offices out of future flood-plains.
- Improve backup cell phone charging options by standardizing charging interfaces, including for car chargers, which allow any phone to be recharged by any charger.
- Assess, develop, and expand alternative communication technologies to increase redundancy and/or reliability.

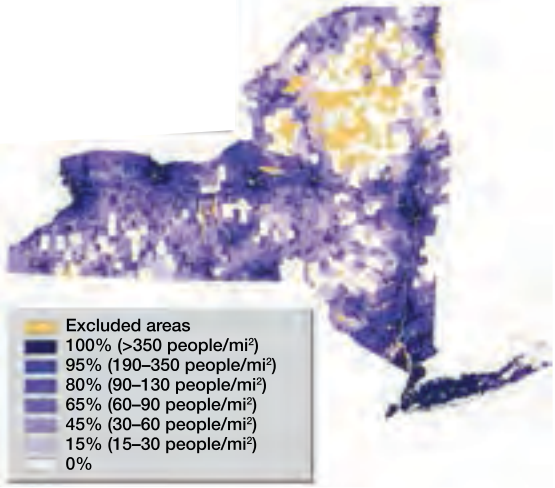
Larger-scale Strategies

- Reassess industry performance standards combined with more uniform regulation across all types of telecommunication services. Provide better enforcement of regulations, including uniform mandatory reporting of outages.
- Develop high-speed broadband and wireless services in rural areas with low population density.
- Decouple telecommunications infrastructure from electric grid infrastructure to the extent possible.

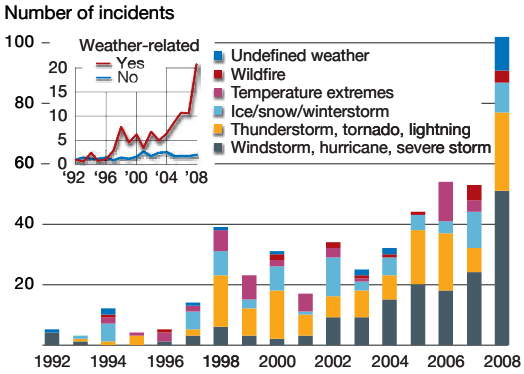
Co-benefits

Increasing redundancy and reliability in the telecommunications sector will reduce outages not only from a changing climate, but also from other non-climate-related risks. Improving telecommunications technology reliability will also help to reduce greenhouse gas emissions from travel.

Cable Modem Broadband Availability, 2009



Significant Weather-related U.S. Electric Grid Disturbances



Telecommunication technologies are dependent on reliable and consistent electric power. The number of electric grid disruptions caused by extreme weather has increased ten-fold since 1992. The fraction of all grid disturbances caused by weather-related phenomena has more than tripled from about 20 percent in the early 1990s to about 65 percent in recent years. While the figure does not demonstrate a cause and effect relationship between climate change and grid disruptions, it does suggest that weather and climate extremes have important effects on grid disruptions. Projections of future increases in extreme events suggest increased risks for the electric grid and the telecommunications that depend on it.

TELECOMMUNICATIONS

Particularly Vulnerable Groups

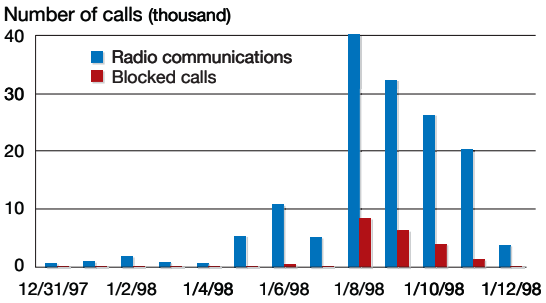
Customers in rural, remote areas are more vulnerable to service disruptions than customers in urban areas, because they have fewer backup service options and often lack wireless and broadband services.

Restoration of communication services following a storm typically happens first in urban areas and then in rural areas, with smaller, remote communities likely to be restored last; this places people in rural areas at increased risk during emergencies.

Within remote, rural areas, elderly, disabled, and health-compromised populations are especially vulnerable to communication service disruptions associated with storm events due to their more limited mobility.

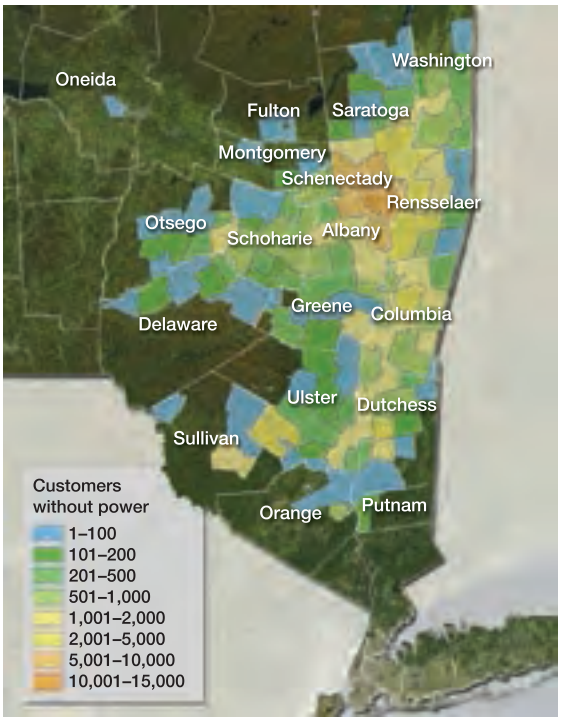
Lower-income populations are more likely to drop landline services; this increases their risk during emergency situations, as a result of their more limited communication options.

Emergency Radio Calls for the 1998 Ice Storm



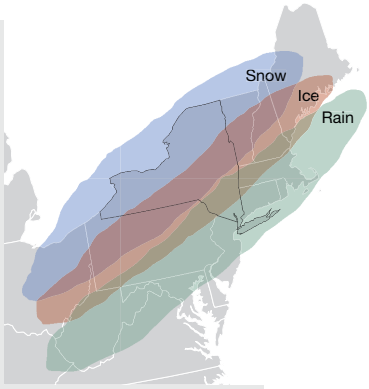
The chart shows the number of emergency radio calls per day (blue) and blocked radio calls (red) because of overload, in one New York State county during the 1998 ice storm. The graph covers 13 days, with a peak number of over 40,000 calls in one day. The first five days show normal background call traffic before the storm hit.

Customers Without Power by Locality, December 2008 Ice Storm



Winter Storm in Central, Western, and Northern New York

Vulnerability of telecommunication services



Severe winter storms in New York generally follow this pattern: a low-pressure system moves up the Atlantic Coast bringing warm moist air that encounters cold dry air in a high-pressure system over Canada and extends into the northern parts of New York. The northward movement of the counterclockwise-rotating storm system causes warm air to overrun the cold air mass. This typically forms three moving bands of precipitation as illustrated on the map to the right.

It is uncertain how climate change will influence extreme winter storms, but telecommunications services are vulnerable even under the current climate. A hypothetical composite of historical extreme winter storms is described. While the three types of precipitation (rain, freezing rain, and snow) would not necessarily be expected to occur concurrently in these proportions, each of these types of extreme winter precipitation is currently expected to occur on average at least once per century.

- Up to 8 inches of rain falls in the rain band in near-coastal New York over a period of 36 hours.
- Up to 4 inches of freezing rain falls in the ice band in central New York, of which between 1 and 2 inches accumulates as ice, over a period of 24 hours.
- Up to 2 feet of snow accumulates in the snow band in northern and western New York over a period of 48 hours.

A storm of this magnitude could result in widespread power and communication outages, with most people who lose electricity also losing communication services. In the Central New York ice storm area, about a half million people would be without power. It would take up to 10 days to restore power to half of these customers living in the larger cities such as Albany, Binghamton, and Schenectady, and up to five weeks to fully restore services to those living in remote, rural areas. Fewer people would be affected in the western and northern New York snow accumulation area. There services may be restored more quickly, first in cities and progressing to rural areas.

Economic damages from productivity losses alone would amount to about 900 million dollars. Costs associated with direct damages—such as spoiled food, damaged orchards, replacement of downed poles and electric and phone wires, medical costs, and emergency shelter expenses—would be of a similar magnitude. In total, productivity and direct damage costs would amount to about $2 billion. These numbers, however, likely underestimate the total costs, given that a 1998 ice storm resulted in losses of about $5.4 billion in Canada alone.

Those most vulnerable to power and communication service disruptions are those that are unable to leave their homes (those with limited transportation options) and those who lack access to cell phones, including elderly, low-income, disabled, and rural populations.

To protect against communication and power outages, trees near power and communication lines can be trimmed, backup poles and wires can be stocked to replace those that are damaged, and readiness of emergency crews to assist with restoration can be arranged in advance of storms. Increasing the fuel supply to extend the duration of emergency backup power at mobile phone cell towers with difficult road access is especially important in areas with low landline, broadband, and internet penetration.

PUBLIC HEALTH

Context

New York State relies primarily on a county-based system for public health service delivery, resulting in a decentralized system in which core services are not provided uniformly.

Information and the capacity to integrate climate change into public health planning remains limited at the local level.

Cardiovascular disease is the leading cause of death in the state and is made worse by extreme heat and poor air quality.

Childhood asthma is an important current health challenge in many parts of New York State, especially in the five counties that comprise New York City, and is made worse by poor air quality.

New York State has experienced the emergence of several vector-borne diseases (those spread by carriers such as mosquitoes and ticks) in the past few decades.

Key Climate Impacts

Demand for health services and the need for public health surveillance and monitoring will increase as climate continues to change.

Heat-related illness and death are projected to increase, while cold-related death is projected to decrease. Increases in heat-related death are projected to outweigh reductions in cold-related death.

More intense precipitation and flooding along the coasts and rivers could lead to increased stress and mental health impacts, impaired ability to deliver public health and medical services, increased respiratory diseases such as asthma, and increased outbreaks of gastrointestinal diseases.

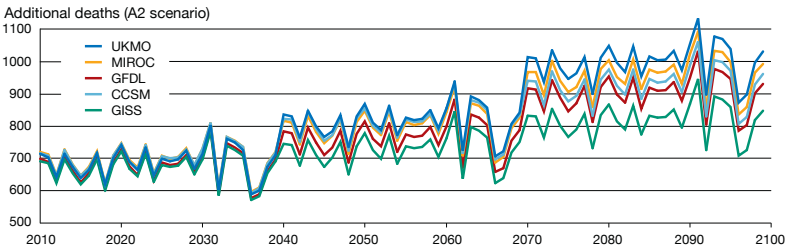
Cardiovascular and respiratory-related illness and death will be affected by worsening air quality, including more smog, wildfires, pollens, and molds.

Vector-borne diseases, such as those spread by mosquitoes and ticks (like West Nile virus), may expand or their distribution patterns may change.

Water supply, recreational water quality, and food production will be at increased risk due to increased temperatures and changing precipitation patterns.

Water- and food-borne diseases are likely to increase without adaptation intervention.

Projected Temperature-related Deaths in NY County



As climate continues to warm, heat-related deaths are expected to increase, while cold-related deaths are expected to decrease. A preliminary study of all of these temperature-related deaths from 2010 to 2100 in New York County was undertaken using 5 climate models from the set of ClimAID models under lower (B1) and higher (A2) emissions scenarios. The results suggest that increases in heat-related deaths will outweigh reductions in cold-related deaths, resulting in a net increase in deaths due to climate change. The lower-emission scenario (B1) is projected to result in substantially fewer deaths by the 2080s, as compared to higher emissions scenarios. The chart shows the results from 5 models for the higher (A2) emissions scenario. These results are broadly consistent with the other global climate models used in ClimAID.

Adaptation Options

Enhanced capacity will be needed to integrate climate adaptation strategies into existing health programs.

Operations, Management, and Infrastructure Strategies

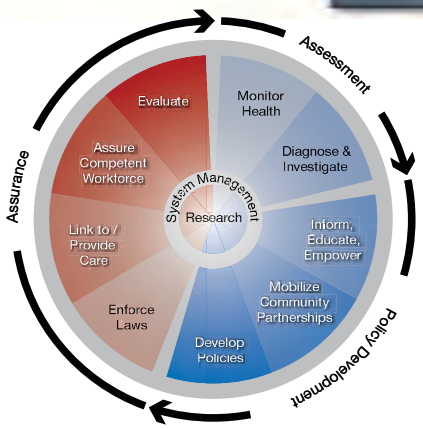
- Extend surveillance of climate and health indicators, including a statewide network of publicly available data monitoring airborne pollen and mold.
- Evaluate extreme heat response plans, focusing particularly on expanding access to cooling services during heat events. Build on this knowledge to develop similar systems for other climate health risks. Target strategies and messages for the most vulnerable populations.
- Plant low-pollen trees in cities to reduce heat without increasing allergenic pollen.

Larger-scale Strategies

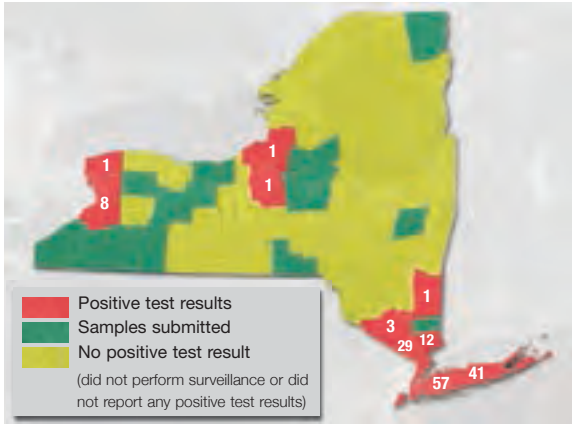
- Environment and health initiatives should be better integrated so that they address both human and ecosystem health and avoid the divide that often exists between them.

Co-benefits

Adaptation strategies which maximize co-benefits, such as cleaner air, improved nutrition, or increased physical activity, should be given priority. Investing in structural adaptations to reduce heat vulnerability, including tree planting, green roofs, and high-reflectivity building materials, will help to reduce energy demand and expense while reducing heat-related risks.



West Nile Virus in Mosquitoes, 2008



While West Nile virus infections in humans and birds have only been reported in a limited part of the state, the prevalence of West Nile virus in mosquitoes is more widespread throughout the state.

Particularly Vulnerable Groups

- Without intervention, existing health disparities are likely to be exacerbated by climate change.
- Age, preexisting illness, neighborhood infrastructure, and/or poverty put people at elevated risk.
- In urban areas, the elderly, persons with impaired immune systems, children, and those with low incomes are at particular risk for heat-related illness and death.
- People in northern parts of the state who are not accustomed to extreme heat are at particular risk for heat-related death.
- People with asthma are particularly vulnerable to ozone and fine-particle air pollution, which could lead to increased illness and death.
- Low-income individuals are more likely to go to the hospital for asthma attacks than wealthier individuals with health insurance who are under doctor supervision and have access to asthma control medications.
- Children, outdoor laborers, and athletes also may be at greater risk for respiratory diseases than those who spend more time indoors and are less active.
- Residents of coastal areas are vulnerable to direct impacts of storm surge flooding, mental health stressors related to evacuation, and mold and toxic exposures when they return home.

PUBLIC HEALTH

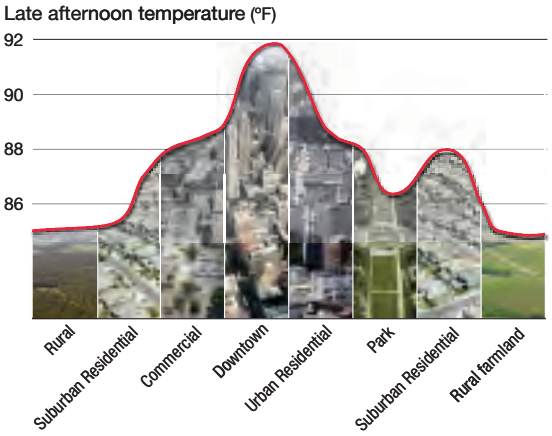
Heat and respiratory problems affect those most vulnerable

Certain groups—including the elderly, low-income populations, and minorities—are more vulnerable than others to climate-change-related health risks including heat-related illness and death.

Summer heat waves have caused increased death in cities across the United States—including in New York City. Climate change will increase the frequency and intensity of heat waves. Urban areas are especially vulnerable because of the high concentrations of susceptible populations and the influence of the urban heat island effect, which makes cities hotter than surrounding areas. Health-relevant increases in heat waves are likely to occur within 20 to 30 years, with much larger increases 50 to 100 years from now. Heat-related deaths are projected to increase significantly as a result.

Home air conditioning is a critical factor for preventing heat-related illness and death. Air conditioning is especially important for elderly, very young, and health-compromised individuals, all of whom have a lower internal capacity to regulate body temperature. In New York City, about 84 percent of households had air conditioning in 2003. However, such resources are not distributed evenly across the city. Many residents living in lower- income neighborhoods lack air conditioning and are thus more vulnerable to extreme heat events. Others, including low-income elderly residents—particularly those living alone—may be reluctant to use air conditioning even if they have it due to concerns about energy costs, even during periods of extreme heat. Furthermore, air conditioning is highly vulnerable to power outages, pointing to the need for longer-term strategies to reduce heat vulnerability.

Urban Heat Island Effect



Large amounts of concrete and asphalt in cities absorb and hold heat. Tall buildings prevent heat from dissipating and reduce air flow. At the same time, there is generally little vegetation to provide shade and evaporative cooling. As a result, parts of cities can be up to 10ºF warmer than the surrounding rural areas, compounding the temperature increases that people experience as a result of human induced warming.

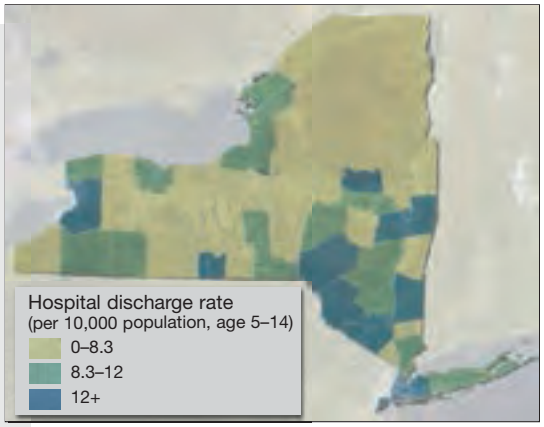
The health effects of extreme heat events can be reduced through adaptation measures. Warning systems and outreach can be used in conjunction with providing more access to public places with air conditioning, such as offering longer hours at community centers for seniors and reducing fares on public transportation. Long-term, engineering-based strategies also can be undertaken, including tree planting and installing green or reflective roofing and insulation in public housing to reduce indoor air temperatures.

Respiratory illness and death also are likely to increase with climate change. Rising temperatures and increasing emissions will result in more air pollution, with summer ozone levels likely to increase significantly. Ozone can increase the risk of asthma-related hospital visits and death. Already, many New Yorkers live in areas in which ozone levels do not meet health standards.

African Americans and Hispanics are particularly vulnerable to decreased air quality because they tend to live in urban centers where they are more exposed to air pollutants. As a group, they are significantly more likely to be hospitalized and die from asthma than other population groups. Children, outdoor laborers, and athletes also may be at greater risk of air pollution exposure than those who spend more time indoors and are less active.

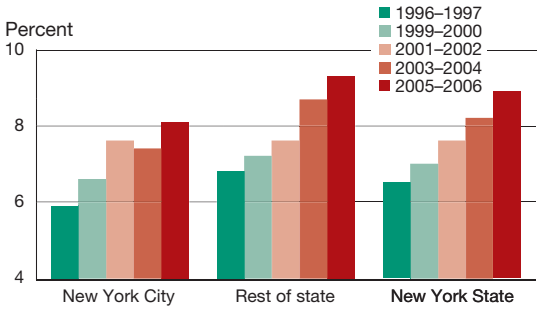
Another probable impact of climate change is increased levels of mold and other allergens that contribute to respiratory health problems. Dampness of households, a key variable for mold growth, is associated with socioeconomic status and could intensify with projected precipitation increases. Mold may contribute to the high rates of hospitalization for asthma among African Americans in cities such as New York.

Hospital Discharge Rate for Children with Asthma, 2005–2007

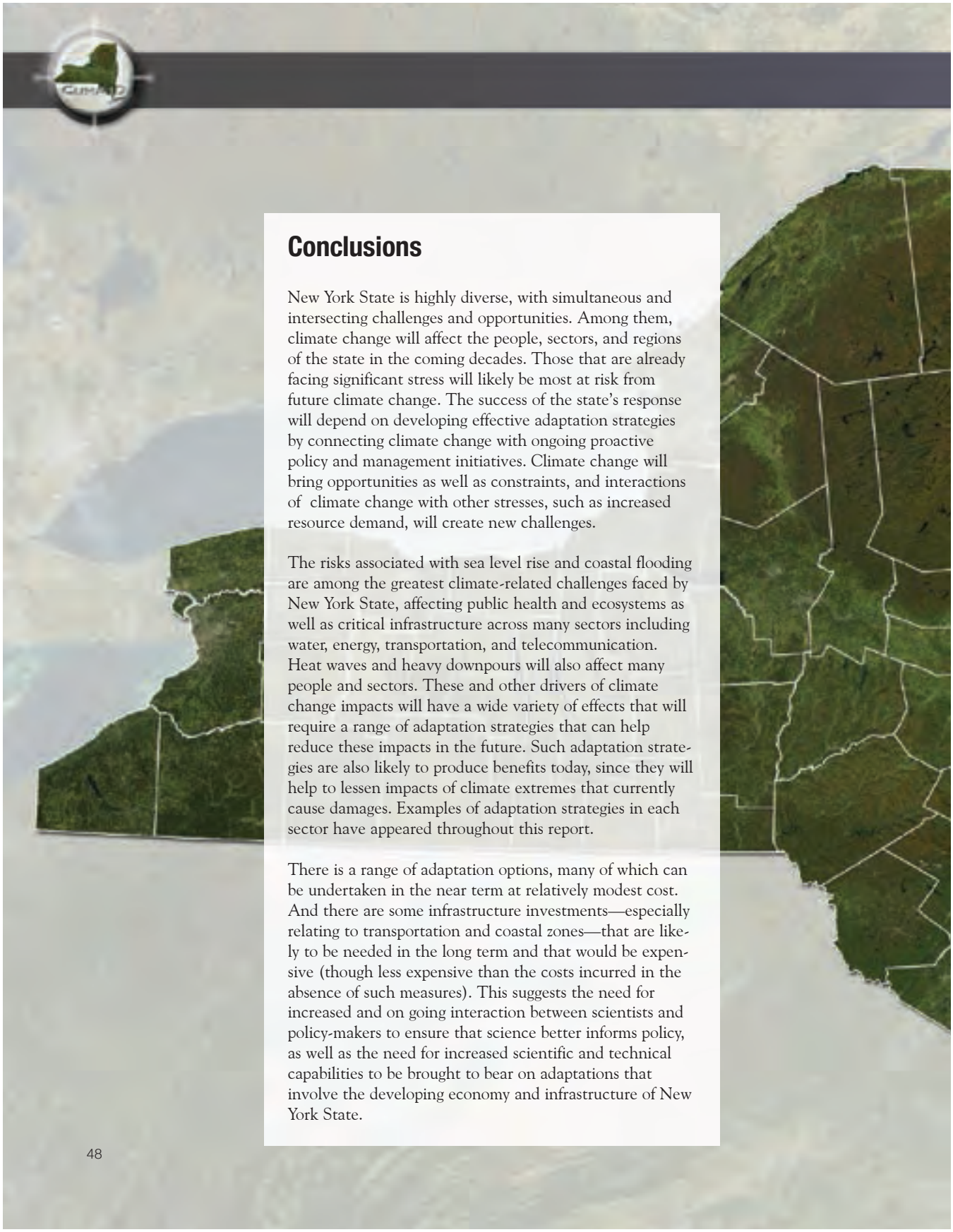


Asthma is climate-sensitive as it is exacerbated by allergies and air pollution, both of which are related to climate. Childhood asthma is an important current health challenge in many parts of New York State, with many asthma events severe enough to require hospitalization. Children from lower-income families who often lack health insurance, regular doctor visits, and medications that can control attacks are more likely to have to seek hospital treatment.

Prevalence of Current Asthma among Adults, 1996–2006



The number of adults with physician-diagnosed asthma increased between 1996 and 2006. This trend is expected to continue given ClimAID projections of rising carbon dioxide and temperatures because asthma is exacerbated by pollen and ground-level ozone. Pollen production increases under high atmospheric carbon dioxide levels, and ozone tends to increase with higher temperatures.



Conclusions

New York State is highly diverse, with simultaneous and intersecting challenges and opportunities. Among them, climate change will affect the people, sectors, and regions of the state in the coming decades. Those that are already facing significant stress will likely be most at risk from future climate change. The success of the state's response will depend on developing effective adaptation strategies by connecting climate change with ongoing proactive policy and management initiatives. Climate change will bring opportunities as well as constraints, and interactions of climate change with other stresses, such as increased resource demand, will create new challenges.

The risks associated with sea level rise and coastal flooding are among the greatest climate-related challenges faced by New York State, affecting public health and ecosystems as well as critical infrastructure across many sectors including water, energy, transportation, and telecommunication. Heat waves and heavy downpours will also affect many people and sectors. These and other drivers of climate change impacts will have a wide variety of effects that will require a range of adaptation strategies that can help reduce these impacts in the future. Such adaptation strategies are also likely to produce benefits today, since they will help to lessen impacts of climate extremes that currently cause damages. Examples of adaptation strategies in each sector have appeared throughout this report.

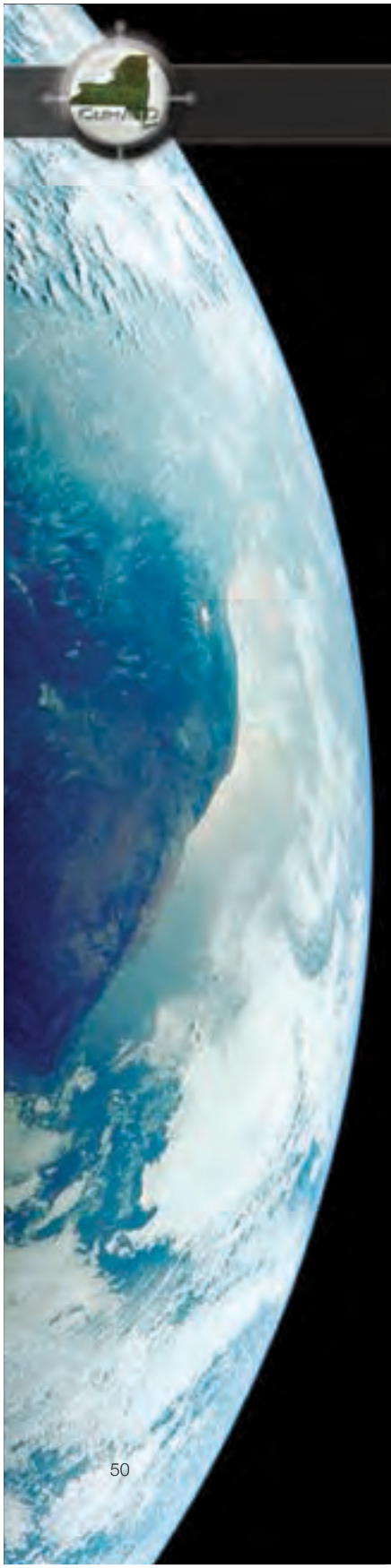
There is a range of adaptation options, many of which can be undertaken in the near term at relatively modest cost. And there are some infrastructure investments—especially relating to transportation and coastal zones—that are likely to be needed in the long term and that would be expensive (though less expensive than the costs incurred in the absence of such measures). This suggests the need for increased and on going interaction between scientists and policy-makers to ensure that science better informs policy, as well as the need for increased scientific and technical capabilities to be brought to bear on adaptations that involve the developing economy and infrastructure of New York State.

Observed Climate Changes

- Annual average temperatures in New York State have risen about 2.4ºF since 1970, with winter warming exceeding 4.4ºF.
- Sea level along New York's coastline has risen about one foot since 1900.
- Since 1900, there has been no discernible trend in annual average precipitation for the state as a whole.
- Intense precipitation events (heavy downpours) have increased in recent decades.

Projected Changes

- Climate models with a range of greenhouse gas emissions scenarios suggest temperature increases across New York State of between 1.5 to 3ºF in the 2020s, 3 to 5.5ºF in the 2050s, and 4 to 9ºF in the 2080s.
- Most climate models project a small increase in annual precipitation. Variability is expected to continue to be large. Projected precipitation increases are largest in winter, mainly as rain, and small decreases may occur in late summer/early fall.
- Sea level rise projections for the coast and tidal Hudson River based on climate models (which do not include increased melting of polar ice sheets) are 1–5 inches by the 2020s, 5–12 inches by the 2050s, and 8–23 inches by the 2080s.
- If the melting of the Greenland and West Antarctic Ice Sheets continues to accelerate, sea level rise would exceed projections based on climate models. A rapid ice melt scenario, based on observed rates of melting and paleoclimate records, yields sea level rise of 37–55 inches by the 2080s.
- Extreme heat events are very likely to increase, and extreme cold events are very likely to decrease throughout New York State.
- Intense precipitation events (heavy downpours) are likely to increase. Short-duration warm season droughts are projected to become more common.
- Coastal flooding associated with sea level rise is very likely to increase. Areas not subject to coastal flooding now could become so in the future.



Recommendations

The ClimAID process has yielded some general recommendations for potential actions that can be taken by policy-makers, managers, and researchers. These recommendations can help make New York State more resilient to current and future climate risk by bringing cutting-edge knowledge and data to groups of empowered and collaborating decision-makers.

Recommendations aimed at statewide decision-makers

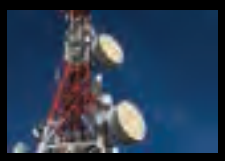
- Promote adaptation strategies that enable incremental and flexible adaptations in sectors, among communities, and across time.
- Identify synergies between mitigation and adaptation. Taking steps to mitigate climate change now will reduce vulnerabilities, increase resilience, and enhance opportunities across all sectors. At the same time, some potential adaptation strategies present significant mitigation opportunities while others work against mitigation.
- Improve public and private stakeholder and general public education and awareness about all aspects of climate change. This could encourage the formation of new partnerships for developing climate change adaptations, especially given limited financial and human resources, and the advantage of shared knowledge.
- Analyze and address environmental justice issues related to climate change and adaptation on a regular basis.
- Consider regional, federal, and international climate-related approaches when exploring climate adaptation options. This is crucial because it is clear that New York State adaptation potential (and mitigation potential as well) will be affected by national and international policies and regulations as well as state-level policies.
- Evaluate design and performance standards and policy regulations based on up-to-date climate projections.
- Create standardized, statewide climate change mitigation and adaptation decision tools for decision-makers, including a central database of climate risk and adaptation information for the state that is the result of an ongoing partnership between scientists and stakeholders.

Management recommendations associated with everyday operations within stakeholder agencies and organizations

- Integrate adaptation responses into the everyday practices of organizations and agencies, with the potential for complementary effects or unintended consequences of adaptation strategies taken into account.
- Take climate change into account within organizational planning and development efforts.
- Identify opportunities for partnerships among organizations and agencies within the state and region.

Recommendations for science and research

- Refine climate change scenarios for New York State on an on going basis as new climate models and downscaled products become available.
- Conduct targeted impacts research in conjunction with local, state, and regional stakeholders.
- Implement and institutionalize an indicators and monitoring program focused on climate, impacts, and adaptation strategies.
- Improve mapping and spatial analysis to help present new impact data and adaptation strategies.
- Focus studies on specific systems that may be subject to nonlinearities or "tipping points." Work should be encouraged to understand the potential for tipping points associated with climate change impacts on natural and social systems.
- Research climate variability, extreme events, and other stakeholder-identified variables of interest including ice storms, extreme precipitation events, and wind patterns.
- Build on economic cost and benefit work to create a better understanding of the costs of climate change and benefits of adaptations on a sector by sector basis.



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ClimAID Leadership Team

Cynthia Rosenzweig (PI), NASA Goddard Institute for Space Studies and Columbia University
William Solecki (PI), City University of New York, CUNY Institute for Sustainable Cities (CUNY CISC)
Arthur DeGaetano (PI), Northeast Regional Climate Center, Department of Earth and Atmospheric Science, Cornell University
Amanda Stevens (Project Manager), New York State Energy Research and Development Authority (NYSERDA)
Mark Watson (Program Manager, Environmental Research), New York State Energy Research and Development Authority (NYSERDA)
Megan O'Grady (Project Manager), Columbia University
Lesley Patrick (Project Manager), City University of New York
Susan Hassol (Science Writer), Climate Communication, LLC
Paul Grabhorn (Graphic Designer), Grabhorn Studio, Inc.
Josh Weybright (Graphic Designer), Graphic Sky, Inc.

ClimAID Teams

Climate
Radley Horton (Lead), Columbia University
Daniel Bader, Columbia University
Arthur DeGaetano, Cornell University
Cynthia Rosenzweig, Columbia University
Lee Tryhorn, Cornell University
Richard Goldberg, Columbia University

Adaptation & Vulnerability
William Solecki, City University of New York
Lee Tryhorn, Cornell University
Arthur DeGaetano, Cornell University

Equity & Environmental Justice
Robin Leichenko (Lead), Rutgers University
Peter Vancura, Rutgers University
Adelle Thomas, Rutgers University

Economics
Yehuda Klein (Lead), City University of New York
Robin Leichenko, Rutgers University
David Major, Columbia University
Marta Panero, New York University

Water Resources
Rebecca Schneider (Sector Lead), Cornell University
Andrew McDonald (Sector Lead), New York State Water Resources Institute
Stephen Shaw, Cornell University
Susan Riha, Cornell University
Lee Tryhorn, Cornell University
Allan Frei, City University of New York
Burrell Montz, East Carolina University

Coastal Zones
Frank Buonaiuto (Sector Lead), City University of New York
Lesley Patrick (Sector Lead), City University of New York
Ellen Hartig, New York City Department of Parks and Recreation
Vivien Gornitz, Columbia University
Jery Stedinger, Cornell University
Jay Tanski, Cornell University
John Waldman, City University of New York

Ecosystems
David W. Wolfe (Sector Lead), Cornell University
Jonathan Comstock, Cornell University
Holly Menninger, Cornell University
David Weinstein, Cornell University
Kristi Sullivan, Cornell University
Cliff Kraft, Cornell University
Brian Chabot, Cornell University
Paul Curtis, Cornell University

Agriculture
David W. Wolfe (Sector Lead), Cornell University
Jonathan Comstock, Cornell University
Alan Lakso, Cornell University
Larry Chase, Cornell University
William Fry, Cornell University
Curt Petzoldt, Cornell University

Energy
Stephen A. Hammer (Sector Lead), Massachusetts Institute of Technology, formerly with Columbia University
Lily Parshall, formerly with Columbia University

Transportation
Klaus Jacob (Sector Lead), Columbia University
George Deodatis, Columbia University
John Atlas, formerly with Columbia University
Morgan Whitcomb, Columbia University
Madeleine Lopeman, Columbia University
Olga Markogiannaki, Columbia University
Zackary Kennett, Columbia University
Aurelie Morla, Columbia University

Telecommunications
Klaus Jacob (Sector Lead), Columbia University
Nicholas Maxemchuk, Columbia University
George Deodatis, Columbia University
Aurelie Morla, Columbia University
Ellen Schlossberg, Columbia University
Imin Paung, Columbia University
Madeleine Lopeman, Columbia University

Public Health
Patrick L. Kinney (Sector Lead), Columbia University
Perry Sheffield, Mount Sinai School of Medicine
Richard S. Ostfeld, Cary Institute of Ecosystem Studies
Jessie L. Carr, Columbia University

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toll free: 1 (866) NYSERDA
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fax: (518) 862-1091

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APPENDIX C: Federal Zoning Standards

PART 28—FIRE ISLAND NATIONAL SEASHORE: ZONING STANDARDS

Subpart A—General Provisions

Sec.

Subpart B—Federal Standards and Approval of Local Ordinances

Subpart C—Federal Review and Condemnation

AUTHORITY: 16 U.S.C. 1,3,459e–2.

SOURCE: 56 FR 42790, Aug. 29, 1991, unless otherwise noted.

Subpart A—General Provisions

§ 28.1 Purpose.

a. The enabling legislation for Fire Island National Seashore (the Seashore) mandated the Secretary of the Interior (the Secretary) to issue regulations which provide standards for local zoning in order to protect and conserve Fire Island. The regulations in this part set forth Federal standards to which local ordinances for Fire Island must conform to enable certain private property within the Seashore to be exempt from Federal condemnation. The standards also apply to use and development of public property. From time to time these standards may be reviewed and revised. These standards are intended:

1. To promote the protection and development of the land within the Seashore, for the purposes of the Fire Is land National Seashore Act (the Act), by means of size, location, or use limitations or restrictions on commercial, residential, or other structures with the objective of controlling population density and protecting the island's natural resources;
2. To limit development and use of land to single-family homes, to prohibit development and use of multiple family homes, and to prohibit the conversion of structures to multiple family homes;
3. To prohibit commercial or industrial uses initiated after September 11, 1964 or the expansion of existing commercial or industrial uses on any property within the Seashore which is inconsistent with the Federal standards and approved local ordinances or the purposes of the Act, is likely to cause a significant harm to the resources of the Seashore or will not provide a service to Fire Island;
4. To recognize that the zoning authorities have the primary responsibility for zoning enforcement within the Seashore;

5. To provide that private property within the Community Development District may be retained by its owner as long as it is maintained in accordance with approved local ordinances and the Federal standards;
6. To provide that, within the Seashore District, private "improved property" may be retained by its owner as long as it is maintained in accordance with approved local ordinances, and the Federal standards;
7. To provide that, in the Dune District, private undeveloped property, if otherwise subject to condemnation, may be retained by its owner as long as it is maintained in its natural state; and
8. To provide a mechanism for the Superintendent to inform landowners and the zoning authority if a use or development will be inconsistent with the Federal standards or the purposes of the Act and may subject the property to condemnation, subject to available funds.

b. The Secretary may utilize any other statutory authority available to the Secretary for the conservation and development of natural resources to the extent the Secretary finds that such authority will further the purpose of the Act.

§ 28.2 Definitions.

a. Accessory structure means any development which is located on the same lot as the principal building or use and is customarily incidental and subordinate to the principal building or use. Accessory structure may include a storage shed, dock, deck, patio, swimming pool, or tennis court but does not include a garbage or bicycle rack and the single primary access walk. Accessory structure includes a guest house without cooking facilities used for overnight habitation.

b. Act means the Fire Island National Seashore Act of September 11, 1964, (16 U.S.C. 459e), as amended.

c. Building means an enclosed structure having a roof supported by columns, walls, or cantilevers. (If a structure is separated by a party wall without openings, it is considered two separate "buildings.")

d. Developed property means any property which has been altered from its natural state by the construction or erection of materials located in, upon, or attached to something located in or upon the ground. Such alterations may include a building, deck, swimming pool, storage shed, patio, dock, tennis court, septic system or leaching field, walkway, groin, fence or sign (except dune protection fences and signs), road, retaining wall, grading, artificial fill, or other structure or material excluding live vegetation.

e. Development means any activity, action, alteration, structure or use which changes undeveloped property into developed property.

f. Exception to a zoning ordinance means any development or change in use of developed property which is not authorized by the zoning ordinance or the variance procedures of the zoning authority or, if authorized by the zoning authority, fails to conform to the ordinance approved by the Secretary or to the Federal standards.

g. Guest house means an accessory structure on the same lot as the principal building that does not contain cooking facilities and is used for the temporary accommodation of guests of a resident living in the principal building.

h. Improved property is developed property defined by the Act to mean any build ing, the construction of which was begun prior to July 1, 1963, together with such amount of land on which said building is situated as the Secretary considers reasonably necessary to the use of said building not, however, to exceed 2 acres in the case of a residence and 10 acres in the case of a commercial use. The Secretary may exclude from such "improved property" any beach or waters, as well as land adjoining such beach or waters, which the Secretary deems necessary for public access thereto.

i. Local ordinance means a State, town, or village law applicable to the development or use of real property.

j. Lot means a parcel of land which meets the minimum acreage and frontage requirements of the zoning authority and is occupied or capable of being legally occupied by one (1) principal building or main building, and the accessory structures or uses including such open spaces as are required by these standards, but in no case does a lot include lands below the toe of the natural foredune line.

k. Non-conforming use means any use or development that, if commenced after the effective date of these standards, fails to conform to these standards; or, if commenced prior to October 17, 1984, failed to conform to Federal standards in effect at the time of

construction or fails to conform to these standards, whether or not the use or development was first commenced in compliance with the local ordinance.

l. Single-family home means a building which contains no more than one kitchen or cooking facility. An exterior barbecue does not constitute a cooking facility for the purposes of this regulation.

m. Undeveloped property means property which has not been altered from its natural state with the exception of dune protection measures such as snow fencing, beach nourishment, dune grass planting, or other approved biological or ecological sand-enhancing or stabilization methods.

n. Zoning authority means the Town of Brookhaven, the Town of Islip, the Village of Saltaire, the Village of Ocean Beach and/or any other legally incorporated village or political subdivision hereafter created and the officials authorized by local ordinance to make rulings and determinations on zoning in said towns and villages.

[56 FR 42790, Aug. 29, 1991, as amended at 62 FR 30235, June 3, 1997]

§ 28.3 Boundaries: The Community Development District; The Dune District; The Seashore District.

a. Generally. The boundaries of the Seashore are described in the Act, as amended, and are delineated on the official boundary maps OGP-OOO2, dated June 1964, and amended by OGP-OOO4, dated May 1978. The maps are available for inspection at the Seashore headquarters. There are three districts: The Community Development District, the Seashore District, and the Dune District.

b. The Community Development District.

1. The seventeen communities which comprise the Community Development District are set out below with their respective west/east boundaries.

   i. Lighthouse Shores—Kismet Park
   West Boundary: 100 feet west of the west line of West Lighthouse Walk. East Boundary: 80 feet east of the east line of Pine Street.

   ii. Seabay Beach
   West Boundary: Approximately 94 feet west of the west line of Seabay Walk. East Boundary: Approximately 94 feet east of the east line of Seabay Walk.

   iii. Saltaire
   West Boundary: 185 feet west of the west line of West Walk. East Boundary: 85 feet east of the east line of East Walk. East Boundary: 85 feet east of the east line of East Walk.

   iv. Fair Harbor
   West Boundary: 333 feet west of the west line of Cedar Walk. East Boundary: The east line of Spruce Walk.

   v. Dunewood
   West Boundary: The east line of Spruce Walk. East Boundary: 85 feet east of the east line of East Walk.

   vi. Lonelyville
   West Boundary: 85 feet east of the east line of East Walk. East Boundary: 100 feet east of the east line of Raven Walk.

   vii. Atlantique
   West Boundary: 80 feet west of the west line of Sea Breeze Walk. East Boundary: 80 feet east of the east line of East End Walk.

   viii. Robbins Rest
   West Boundary: The west line of Compass Walk. East Boundary: 113 feet east of the east line of Sextant Walk.

   ix. Fire Island Summer Club— Corneille Estates
   West Boundary: 100 feet west of west line of Schooner Walk. East Boundary: 100 feet east of east line of Frigate Roadway.

   x. Ocean Beach
   West Boundary: 7 feet west of the west line of Surf Road. East Boundary: 2 feet east of the east line of Surf View Walk.

   xi. Seaview
   West Boundary: East line of Surf View Walk. East Boundary: 200 feet east of Laurel Avenue.

   xii. Ocean Bay Park
   West Boundary: 90 feet west of the west line of Superior Street. East Boundary: 100 feet East of the east line of Cayuga Street.

   xiii. Point O'Woods
   West Boundary: 100 feet east of the east line of Cayuga Street. East Boundary: Western boundary of Sunken Forest Preserve.

xiv. Cherry Grove
West Boundary: The west line of West Walk. East Boundary: Approximately 100 feet east of the east line of Ivy Walk.

xv. Fire Island Pines
West Boundary: Approximately 150 feet west of the west line of Sandy Walk. East Boundary: Approximately 120 feet east of Sail Walk.

xvi. Water Island
West Boundary: The west line of Charach Walk.East Boundary: Approximately 100 feet east of the east line of East Walk.

xvii. Davis Park
West Boundary: 90 feet west of the west line of Eider Duck Walk. East Boundary: 90 feet east of east line of Whalebone Walk.

2. The northern boundary of the communities listed in paragraph (b)(1) of this section is the mean high water line on the south shore of the Great South Bay.

3. The southern boundary of the communities listed in paragraph (b)(1) of this section is the mean high water line on the south shore of Fire Island.

c. The Seashore District. The Seashore District is comprised of all portions of the lands and waters within the boundary of the Seashore which are not included in the Community Development District with the exception of the headquarters facilities at Patchogue and the William Floyd Estate at Mastic.

d. The Dune District. The Dune District extends from the mean high water line to 40 feet landward of the primary natural high dune crest, as defined on Fire Island National Seashore Map #OGP–0004 and on Suffolk County Property Maps, section numbers 491–498 (Islip), 002 (Ocean Beach), 002–004 (Saltaire), and 985.70–987 (Brookhaven), as mapped in November 1976 or as subsequently remapped. Map overlays of the Dune District are available for inspection in the Office of the Superintendent of the Seashore. The Dune District overlaps portions of the Community Development District and the Seashore District.

§ 28.4 Severability.

The invalidation of any provision of this part 28 by any court of competent jurisdiction shall not invalidate any other provision thereof.

Subpart B—Federal Standards and Approval of Local Ordinances

§ 28.10 Permitted and prohibited uses.

a. The Community Development District

1. Permitted uses.

i. The construction, alteration, expansion, movement, reconstruction, and maintenance of a detached building which is used principally as a single-family home, church, school, or community facility; as an accessory structure; or as an office for a professional occupation, as defined in approved local ordinances is permitted. Reconstruction of non-conforming uses is permitted in accordance with § 28.11. A professional office may be maintained only incidental to a residential use and shall be utilized by a person residing on the premises.

ii. A commercial or industrial use in continuous and unchanged operation since September 11, 1964 is permitted. Any change in use of a commercial or industrial use since September 11, 1964 including construction, expansion, or conversion of an existing structure or a change in type, mode or manner of operation constitutes a new commercial or industrial use and may be permitted subject to the approval of the local zoning authority and review by the Superintendent.

iii. A commercial or industrial use initiated after September 11, 1964 constitutes a new commercial or industrial use and may be permitted with the approval of the local zoning authority and review by the Superintendent. Any change in use of a commercial or industrial use approved by a local zoning authority after September 11, 1964, including construction, expansion, or conversion of an existing structure, or a change in type, location, mode or manner of operation, shall constitute a new commercial or industrial use and may be permitted with approval of the local zoning authority and review by the Superintendent.

2. Prohibited uses.

   i. The construction or expansion of an apartment building or other building with multiple dwelling units or conversion of an existing building into a multiple family home is prohibited.

   ii. The construction or expansion of a guest house with cooking facilities, or conversion of an existing structure to a guest house with cooking facilities is prohibited.

   iii. The subdivision of land into lots which are less than 4000 feet, or that do not meet the requirements of the applicable approved zoning ordinance is prohibited.

   iv. The rezoning of an area zoned residential to commercial or industrial without review by the Secretary is prohibited.

b. The Seashore District

1. Permitted uses.

   i. The alteration, expansion, movement, and maintenance of privately-held ''improved property'' used as a single-family home or as an accessory structure is permitted. Reconstruction is permitted in accordance with § 28.11.

   ii. Any use consistent with the purposes of this Act, which is not likely to cause significant harm to the natural resources of the Seashore, on any lands, whether publicly or privatelyheld, which lie below mean high water in either the Atlantic Ocean or the Great South Bay is allowable.

2. Prohibited uses. Construction, development or expansion of any property other than ''improved property'' is prohibited. The provisions of paragraph (a)(2) of this section apply to all privately-held property in the Seashore District.

c. The Dune District

1. Permitted uses.

   i. A community vehicular and private or community pedestrian dune crossing approved by the zoning authority and reviewed by the Superintendent as necessary for access to areas behind the dune. Such dune protection measures as snow fencing, poles, beach nourishment, dune grass planting, or other scientifically sanctioned biological or ecological sand enhancing or stabilization methods are allowable.

   ii. Residential use and maintenance of an existing structure or reconstruction in accordance with § 28.11 is allowable.

2. Prohibited uses.

   i. Any development subsequent to November 10, 1978 including construction of a new structure or expansion of an existing structure, such as a building, bulkhead, pile, septic system, revetment, deck, swimming pool, or other structure or manmade dune stabilization device except as allowed under paragraph (c)(i) of this section.

   ii. Any use of the dune, other than those outlined in paragraph (c)(1)(i) of this section, including recreational use.

3. Conflict with other provisions. If a development or lot lies partially within the Dune District and partially in the Community Development District, or partially within the Dune District and partially within the Seashore District, and the standards applicable to the development, lot, or use are in conflict, the standards for the Dune District prevail for the portion of the development, lot, or use which lies within the Dune District. (d) General recreation, environmental and historic preservation and education, and natural resource protection uses and facilities consistent with the uses and facilities appropriate for each zone as set forth in the General Management Plan and Final Environmental Impact Statement are permitted on publicly-held property.

§ 28.11 Nonconforming uses.

a. Any use or structure lawfully existing under local law as of October 17, 1984 and rendered nonconforming by adoption of the federal standards may continue, subject to the provisions of this section, and will not lose its exemption from condemnation, if otherwise eligible.

b. Change in nonconforming uses.

1. No nonconforming development or use may be altered, intensified, enlarged, extended, or moved except to bring the use or structure into conformity with the approved local zoning ordinance.

2. A nonconforming use which has been abandoned for more than one (1) year may not be resumed or replaced by another nonconforming use or structure.

3. A nonconforming use in the Dune District may be moved to bring it into conformity with the approved local zoning ordinance.

c. Reconstruction of nonconforming uses. If a nonconforming use or structure is severely damaged (as determined by fair professional insurance practices), destroyed or rendered a hazard, whether by fire, natural disaster, abandonment or neglect, no alteration, intensification, enlargement, reconstruction, extension, or movement is allowable without compliance with the following conditions:

1. No use or structure within the Seashore built in violation of a local ordinance when constructed may be reconstructed except in compliance with the approved local zoning ordinance.
2. Local building permit applications for reconstruction shall be filed with the appropriate zoning authority within one (1) year of the damage, destruction, or abandonment.
3. A commercial or industrial use may not be reconstructed without the approval of the local zoning authority and review by the Superintendent.
4. A nonconforming use in the Community Development District or in the Seashore District (i.e. "improved property") may be reconstructed to previous dimensions. It may not be altered, enlarged, intensified, extended, or moved except to bring the use or structure into conformity with the approved local zoning ordinance.
5. A nonconforming use in the Dune District may be reconstructed if it can conform to the approved local zoning ordinance and lie north of the crest of the dune at the time of reconstruction.

§ 28.12 Development standards.

No use allowable under § 28.10 may be developed, constructed, altered, or conducted unless it complies with the following:

a. A single-family home is the only type of development permitted in a residential district defined by a local zoning authority.

b. Commercial or industrial development is limited to commercial or business districts defined by a zoning authority within the Community Development District. Such development must provide a service to Fire Island and will not be likely to cause significant harm to the natural resources of the Seashore.

c. Minimum lot size is 4,000 square feet. A subdivision must comply with the subdivision requirements of the applicable zoning authority and may not result in development of any lot which is less than 4,000 feet.

d. Maximum lot occupancy for all development may not exceed 35 percent of the lot. Lot occupancy is calculated to include all buildings and accessory structures on the property and any extension of the upper floors beyond the developed area on the ground level.

e. Lot occupancy of all privatelyheld improved property in the Seashore District is limited to 35 percent of the square footage of a lot that is less than 7,500 square feet, and to 2,625 square feet for a lot 7,500 square feet or greater. Lot occupancy is calculated to include all buildings and accessory structures on the property and any extension of the upper floors beyond the developed area of the ground.

f. No building or accessory structure may be erected to a height in excess of 28 feet as measured from the average existing ground elevation or the minimum elevation necessary to meet the prerequisites for Federal flood insurance as determined by the National Flood Insurance Program/FEMA shown on Flood Insurance Rate Maps for Fire Island communities.

g. A swimming pool is an allowable accessory structure and is calculated in measuring lot occupancy.

h. No sign may be self-illuminated.

i. A zoning authority shall have in effect limitations, requirements, or restrictions on the burning of cover and trash, excavation, displacement or removal of sand or vegetation, and the dumping, storing, or piling of refuse materials, equipment or other unsightly objects which would pose safety hazards and/or detract from the natural or cultural scene.

j. A zoning authority shall have in place ordinances to lessen the potential for flood and related erosion and property losses consistent with the Federal Insurance Administration's National Flood Insurance Program criteria for "Land Management and Use," as set forth in 24 CFR part 1910, subpart A, as it may from time to time be amended.

§ 28.13 Variance, commercial and industrial application procedures.

a. The zoning authority shall send the Superintendent a copy of all applications for variances, exceptions, special permits, and permits for commercial and industrial uses submitted to the zoning authority within five calendar days of their submission of the completed application by the applicant.

b. The zoning authority shall send the Superintendent a copy of the written notice of the dates and times of any public hearing to be held concerning an application no less than 10 days prior to the date of the hearing.

c. The zoning authority shall send the Superintendent a copy of the written notice within fifteen calendar days of the approval or disapproval of any application for a variance, exception, special permit, or permit and copies of any variance, exception, special permit, or certificate which has been granted.

d. The zoning authority shall send copies of all correspondence referred to in this section to: The Superintendent, Special Attention: Zoning, Fire Island National Seashore, 120 Laurel St., Patchogue, New York 11772.

§ 28.14 Emergency action.

If allowable by local law and if immediate action is essential to avoid or eliminate an immediate threat to the public health or safety or a serious and immediate threat to private property or natural resources, an agency or person may commence a temporary use without a permit from the zoning authority. In all cases, the agency or person shall inform the Superintendent and send an application for a permit to the zoning authority within 10 days after the commencement of the use and the applicant shall proceed in full compliance with the provisions of the approved local zoning ordinance. When the reasons for undertaking the emergency action no longer exist, the agency or person shall cease an emergency action taken under this section.

§ 28.15 Approval of local zoning ordinances.

a. The Secretary shall approve local ordinances or amendments to approvedordinances which conform to these regulations. The Secretary may not, however, approve an ordinance or amendment thereto which:

1. Contains a provision that the Secretary considers adverse to the protection and development of the Seashore;
2. Does not comply with the federal standards set out in §§ 28.10, 28.11, and 28.12; or
3. Fails to provide for the variance procedures of § 28.13.

b. A zoning authority from time to time may amend its ordinance. At such time the Secretary may revoke the approval of any ordinance or portion of an ordinance which fails to conform to these regulations. Upon resubmission by the zoning authority of an amended ordinance, the Secretary shall approve the ordinance, if it conforms with the requirements of paragraph (a) of this section.

c. Secretarial approval of a local ordinance will be withdrawn if the Secretary finds that a zoning authority is not enforcing its ordinance.

Subpart C—Federal Review and Condemnation

§ 28.20 Review by the Superintendent.

a. The Superintendent, within 15 working days of the receipt of a copy of an application for a variance, exception, permits for commercial or industrial use, or special permit submitted to the zoning authority for any development, use or change in use shall provide the applicant/landowner and the appropriate zoning authority written comments on the application. The purpose of the Superintendent's review is to determine if the proposed use or development does not conform to the federal standards and the purposes of the Act or is likely to cause significant harm to the natural resources of the Seashore. If the Superintendent's review determines the proposal does not conform, the Superintendent shall inform the applicant/landowner and appropriate zoning authority that should the proposed use or development proceed, the National Park Service may seek to enjoin the development and acquire the property by condemnation.

b. The Superintendent may also appeal the decision of the zoning authority pursuant to procedures of local law.

§ 28.21 Suspension of condemnation authority in the communities.

The Secretary has the authority to acquire land by condemnation. Upon Secretarial approval of local ordinances, Secretarial authority to acquire by condemnation private property within the communities and "improved property" in the Seashore District that conforms to the federal standards and the provisions of the Act or is not likely to cause significant harm to the natural resources of the Seashore is suspended, except as provided for in § 28.22.

§ 28.22 Condemnation authority of the Secretary.

a. The Secretary has the authority to exercise powers of condemnation with respect to:

1. Private property within the 8-mile area between the eastern boundary of Davis Park and the western boundary of the Smith Point County Park;
2. Any beach or water and such adjoining land as the Secretary determines is necessary for access to the beach or water;
3. Any property for which the Certificate of Suspension of Authority for Acquisition by Condemnation has been revoked;
4. Any property, if the approval of the ordinance of the zoning authority has been revoked; partially revoked, or an exception was made to the Secretarial approval and such property fails to conform to these standards, or any property where the appropriate local zoning authority does not have an ordinance approved by the Secretary;
5. Any property built or altered after October 17, 1984 that does not conform to the regulations in this part 28;
6. Any property which becomes an exception to or has been granted a variance, exception, or special use permit after October 17, 1984 that fails or will fail to conform to the regulations in this part 28;
7. Any new commercial or industrial use that the Superintendent has determined does not conform with § 28.20(a). A new commercial or industrial use is defined as any commercial or industrial use commenced after September 11, 1964. Any change in use of a commercial or industrial use including construction, expansion, or conversion of an existing structure, or change in type, location, mode, or manner of operation, constitutes a new commercial or industrial use;
8. Any property with respect to which the Secretary's authority to condemn was not suspended and the property failed to conform to the federal standards existing at the time of construction, modification, or commencement of a use, unless such construction, modification or use conforms to the current federal standards; and
9. Any property in violation of a local ordinance required by § 28.12 (i) and (j).

b. Undeveloped property which is otherwise subject to condemnation under the Act is not subject to condemnation if it is located in the Dune District and is maintained in its natural state.

c. The Secretarial authority to condemn any property in the Seashore is suspended for any structure or use constructed, modified, or commenced prior to October 17, 1984 if:

1. It was built or conducted in conformity with local zoning ordinances and procedures in effect at the time of such construction or commencement or had been issued a variance under local law;
2. It was built or conducted in conformity to the federal standards existing at the time of such construction or commencement or to these standards; and
3. The local zoning ordinance is approved by the Secretary without exceptions, or if approved by the Secretary with exceptions, such exceptions are not pertinent or applicable to the property.

d. The above provisions shall not be interpreted to otherwise limit or circumscribe the authority of the Secretary to condemn property as provided by the Act, or other provisions of law.

§ 28.23 Certificates of suspension of authority for acquisition by condemnation.

Upon approval of a local zoning ordinance, a private property owner may apply to the Superintendent for a Certificate of Suspension of Authority for Acquisition by Condemnation. Procedures for obtaining a certificate are as follows:

a. A property owner shall submit an application for a certificate to: Superintendent, Fire Island National Seashore, 120 Laurel Street, Patchogue, New York 11772.

b. An application for a certificate shall contain:

1. A current survey of the lot showing the dimension of all buildings, accessory structures, garbage and bicycle racks, all access walks, and any extensions of the upper floors beyond the developed area on the ground level;
2. On the survey, the line of mean high water, the toe of the dune, and the crest of the dune shall be identified if they traverse the lot;
3. A floor plan of each floor of each building showing the configuration of all rooms and cooking facilities;
4. A vertical drawing of the structure showing actual ground level and building height; and
5. Copies of the original and all subsequent building permit applications and permits, certificates of occupancy, certified-as-completed surveys, variances, special use permits, certificates of pre-existing use, or other documents relating to local authorization to develop or use the property. The burden rests on the applicant to show that the structure conformed to local law at the time of construction and at the time of each subsequent alteration and that the structure conforms to current federal standards.
6. For commercial or industrial uses, the owner of the property shall submit further information describing the type, mode, and manner of operation. All local, county, state, or federal licenses and permits required for construction, occupancy, operation of the commercial activity shall be submitted. Any change in use as described in § 28.10(a)(1)(iii) will require application for a new certificate.

c. Upon receipt of the application, the Superintendent shall conduct a site inspection of both the interior and exterior of the property.

d. After review of the materials submitted by the applicant and other pertinent information, and completion of the site inspection, the Superintendent shall determine whether the Secretary's authority to acquire by condemnation is suspended, and if so, shall furnish to any eligible party in interest a Certificate of Suspension of Authority for Acquisition by Condemnation.

e. A Certificate of Suspension of Authority for Acquisition by Condemnation may be revoked at any time that the Secretary's authority to condemn is reinstated or that it becomes evident to the Superintendent that the Certificate was initially issued by mistake or on misinformation.

§ 28.24 Information collection.

The collection of information contained in §§ 28.13, and 28.23 have been approved by the Office of Management and Budget under 44 U.S.C. 3501 et seq. and assigned clearance number 1024– 0050. The information will be used to determine if private property conforms to the federal regulations. Response is required to obtain a benefit in accordance with 16 U.S.C. Section 459e et seq.

APPENDIX D: Draft Wilderness Stewardship Plan

2014

Draft -Wilderness Stewardship Plan and Backcountry Camping Policy

Otis Pike Fire Island High Dune Wilderness

National Park Service

Fire Island National Seashore

Fire Island National Seashore Wilderness Stewardship Plan –Draft July 2014

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Fire Island National Seashore Wilderness Stewardship Plan –Draft July 2014

I. PURPOSE AND NEED

The purpose of this Wilderness Stewardship Plan (WSP) and Backcountry Camping Policy is to guide Fire Island National Seashore (the Seashore) in making decisions regarding the future use and protection of the congressionally designated Otis Pike Fire Island High Dune Wilderness (the Fire Island Wilderness) and areas adjacent to the wilderness that are designated backcountry camping areas.

This plan revises and updates the 1983 Wilderness Management Plan, incorporating elements of the National Park Service (NPS) Wilderness Education and Partnership Plan (June 6, 2002) and the NPS Wilderness Stewardship Plan Handbook (August 11, 2004). It identifies the core qualities of wilderness character and outlines the framework through which the Fire Island Wilderness can be preserved, consistent with law, policy, and the specific legislative history applicable to this wilderness. It also revises the 2011 Fire Island National Seashore Interim Backcountry Camping Policy

Section 2(a) of the 1964 Wilderness Act states that wilderness areas "shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character…" The Wilderness Act further acknowledges agency responsibility to preserve wilderness character in section 4(b), Use of Wilderness Areas. National Park Service (NPS) policy contributes to the need for this plan by mandating that "In addition to managing these areas for the preservation of the physical wilderness resources, planning for these areas must ensure that the wilderness character is likewise preserved" (2006 Management Policies, 6.3).

The Fire Island Wilderness therefore is managed such that "the earth and its community of life are untrammeled by man," and "to preserve its natural conditions." The preservation of wilderness character and values includes providing "outstanding opportunities for solitude or a primitive and unconfined type of recreation," with "the imprint of man's work substantially unnoticeable." Activities to achieve other legal purposes of the area within the designated wilderness will be administered so as to preserve its wilderness character.

Definitions

from Director's Order #41: Wilderness Preservation and Management

Backcountry: The National Park Service uses the term "backcountry" to refer to primitive, undeveloped portions of parks. "Backcountry" is not the same as "wilderness," and is not a specific management zone. Rather, it refers to a general condition of land that may occur in zones outside wilderness. Wilderness and backcountry may require different administrative practices because the Wilderness Act imposes additional conditions and constraints.

Designated Wilderness: Federal land designated by Congress as a wilderness area and a component of the National Wilderness Preservation System, where NPS is required to manage according to the Wilderness Act of 1964.

Fire Island National Seashore Wilderness Stewardship Plan –Draft July 2014

II. INTRODUCTION

On September 3, 1964, the United States Congress passed the Public Law 88-577, known as the "Wilderness Act," which established a National Wilderness Preservation System to be composed of federally owned land set aside "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." Congressional designation of wilderness areas assures the long-term protection of wild and undeveloped federal lands. On September 11, 1964, eight days after the passage of the Wilderness Act, Congress passed Public Law 88-587 establishing the Fire Island National Seashore (referred to here as the Seashore) "for the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features… Which possess high value to the Nation as an example of unspoiled areas of great beauty in close proximity to large concentrations of urban population."

The Seashore's enabling legislation refers to a section of the Seashore lying between the easterly boundary of Davis Park and the westerly boundary of Smith Point County Park, commonly known as the "8-mil zone" that will be accessible by "ferry and footpath only" and "no development or plan for the conveniences of visitor shall be undertaken therein which would be incompatible with the preservation of the flora and fauna or the physiographic conditions now prevailing and every effort shall be exerted to maintain and preserve this section of the Seashore… in as nearly [its] present state and condition as possible." A copy of the Seashore's enabling legislation is included in appendix A. The emphasis throughout this Act is clearly the perpetuation of the values of unspoiled natural areas within proximity of one of the largest and most highly urbanized regions in the world.

With the passage of the Eastern Wilderness Act (Public Law 96-622) in 1975, Congress created 16 new wilderness areas to be included in the National Wilderness Preservation System and directed the National Park Service to study, designate, and preserve areas in the eastern portions of the country as wilderness. The Act states, "areas of wilderness in the more populous eastern half of the United States are increasingly threatened by the pressures of a growing and more mobile population, large-scale industrial and economic growth, and development and uses inconsistent with the protection, maintenance, and enhancement of the areas' wilderness character." This Act allows for areas where the landscape was once affected by the influence of humans to be reconstituted to their natural state and be designated as wilderness.

The General Management Plan for the Seashore approved in 1978 stated that the "8-mile zone" would be managed as a primitive zone called the High Dune Management Unit. The plan also requested that the National Park Service review the lands within this area to determine their suitability for inclusion in the National Wilderness Preservation System.

On December 23, 1980, Congress passed Public Law 96-585 establishing Otis Pike Fire Island High Dunes Wilderness, comprising approximately 1,380 acres of the Seashore. Approximately 1,363 acres were designated as wilderness in 1980, and 18 more acres were identified as potential wilderness additions. The Fire Island Wilderness is distinct, as it is the smallest wilderness managed by the National Park Service and the only federally designated wilderness in New York State. The establishment of the wilderness is the culmination of previous legislative and management direction to preserve and maintain this section of the Seashore in a primitive and natural state.

When the Seashore completed the 1983 Wilderness Management Plan, the Fire Island Wilderness included an NPS horse barn, 20 other structures occupied by reserved rights holders (one at Old Inlet, 12 at Whalehouse

Point, and seven at Long Cove, all of which expired in 1992), and a network of off-road vehicle trails called Burma Road. With a few exceptions authorized by the Fire Island Wilderness legislation, the structures and facilities that were in the area at the time of designation and that were incompatible with wilderness have been removed, the uses and activities inconsistent with wilderness have ended, and the area has largely been restored to its natural state.

Following the removal of previous incompatible uses, 17 additional acres of land were designated wilderness in 1999 under a Federal Register Notice. Since 1999 there remained approximately one acre of potential wilderness additions within Fire Island National Seashore. In 2014 this one acre was designated as wilderness through a Federal Register notice. (See Section VI. C. for a brief description of the location and management intentions for these Wilderness additions.)

In 2006 the National Park Service, in preparation for the park's new General Management Plan (GMP), conducted a series of dialogues on critical park and community issues. One of the issues discussed was the need for a new Wilderness Management Plan. Early in the GMP process, the National Park Service decided that a Wilderness Stewardship Plan would be developed and would be approved as part of the GMP.

In 2011 the park established an Interim Backcountry Camping Policy to be implemented for the Fire Island Wilderness and on adjacent portions of the Atlantic Ocean Beach of Fire Island. This policy was based on the approved November 1983 Wilderness Management Plan for FIIS and constituted an amendment of the 1984 FIIS Wilderness Camping Policy, addressing current human health and safety issues for the visitor and staff, natural resource management concerns, and increased demand for use of the area. This policy simultaneously minimized human impact on resources and provided for a safe, high-quality backcountry experience.

III. BACKCOUNTRY/WILDERNESS DESCRIPTION

At Fire Island National Seashore, the backcountry is in the eastern portion of the park and stretches from the eastern boundary at Watch Hill east to the Wilderness Visitor Center. It includes the land up to mean high tide on the Great South Bay and the lands (sandy beach) down to mean high tide on the Atlantic shoreline, inclusive of the Fire Island High Dune Wilderness.

The Fire Island Wilderness is a portion of the backcountry and is located in this same area, with the designated wilderness boundary being the toe of the dune on the south/Atlantic Ocean shoreline and mean high tide line on the north Great South Bay shoreline.

There is an ocean-to-bay parcel of non-federally owned land, Bellport Beach, which lies roughly in the middle of the Wilderness. Bellport Beach separates the Wilderness into Eastern and Western segments. For backcountry camping purposes, portions of the Atlantic Ocean Beach on Fire Island that lie to the south of the eastern and western camping zones defined within the Fire Island Wilderness are also designated for overnight use. (A Wilderness Map is included in Appendix C.)

A . General Boundary Description

Western Segment: This segment’s western boundary extends along the easternmost edge of the Watch Hill Campground and nature trail. The western boundary connects to the southern boundary, legislatively defined as "the toe of the primary dune," which in turn runs along the Atlantic Ocean Beach until it intersects the eastern boundary. The beach adjacent to this southern boundary is the area designated as park backcountry. The eastern boundary coincides with the western boundary of Bellport Beach, a village-owned facility excluded from

Wilderness designation. This mutual boundary extends from the toe of the primary dune to the shore line of the Great South Bay at mean high water. The northern boundary extends along the Great South Bay at mean high water and intersects the western boundary described above.

Eastern Segment: This segment's western boundary coincides with the eastern boundary of Bellport Beach and extends from the Great South Bay at mean high water on the north to the toe of the primary dune on the south. The southern boundary extends along the toe of the dune from this point until it generally coincides with the western boundary of the Smith Point County Park. The Atlantic Ocean beach adjacent to this southern boundary is the area designated as park backcountry. The eastern boundary of the Wilderness extends along the western boundary of Smith Point County Park between the toe of the primary dune on the south and the Great South Bay at mean high water on the north, except that it excludes the existing Wilderness Visitor Center and the 100 feet of land surrounding the perimeter of the building. The northern boundary extends along the Great South Bay at mean high water from the Smith Point County Park on the east until it coincides with the eastern boundary of the Bellport Beach, as previously described.

Due to the dynamic nature of the shifting dunes, salt marshes, and barrier island shorelines, both the southern and northern boundaries are subject to frequent fluctuation. Where there is an overwash, break in the dunes, breach, etc., the Fire Island Wilderness will be managed as if the boundary extended to the toe of the dunes on either side of the break. For a more precise description of the Fire Island Wilderness boundary, please refer to the detailed boundary map in Appendix C.

B. Potential Wilderness Additions

Following the 1980 wilderness study, a recommendation was forwarded to the Congress by the President that identified some lands within the Seashore as "potential" wilderness for future designation when the nonconforming use has been removed or eliminated. If authorized by Congress, potential wilderness areas will become designated wilderness upon the Department of Interior Secretary's determination and publication in the Federal Register[1].

Two areas within the Fire Island Wilderness had facilities that were deemed incompatible with wilderness designation and were classified as Potential Wilderness Additions. They no longer contain the incompatible facilities and therefore were added to designated wilderness upon notification in the Federal Register by the Secretary of the Interior.

See Section VI. C. for a brief description of the location and management intentions for these potential wilderness additions.

IV. WILDERNESS-BACKCOUNTRY USE

Wilderness is described in the Wilderness Act 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." The visitor must accept wilderness largely on its own terms. Modern conveniences are not provided for the comfort of the visitor; and the risks of wilderness travel, of possible dangers from accidents, wildlife, and natural phenomena must be accepted as part of the wilderness experience.

The 2011 Backcountry Camping Policy addressed the current demand for use of the area, natural resource management concerns, and increased human health and safety issues for the visitor and staff. This interim policy

[1] www.wilderness.net; National Park Service Wilderness Designation Process

is now integrated into this plan, which will simultaneously minimize human impact on resources and provide for a safe, quality backcountry experience.

In 1984, a primitive or wilderness camping policy was established for the Seashore by a team of experienced backpackers, park planners, and resource managers who also established backcountry permit levels, developed regulatory and safety pamphlets, and implemented monitoring techniques. Dispersed individual camping levels (no more than 24 campers per night, with a maximum of 8 per group in the West Zone, and no more than 12 campers per night with a maximum group size of 4 in the East Zone, equating to 36 campers per night total) only slightly exceeded the levels originally proposed in the 1978 GMP for camping at Old Inlet (two 15-person-capacity primitive camping areas with a total of 30 campers per night). These limits have been in place since 1984 and have seldom been met or exceeded on a nightly basis, with exception of holiday weekend dates during spring through early fall; the annual camper visitation count is always far less than the originally proposed figure.

The 1978 GMP states that day-use visitation at Old Inlet was projected to be 320 and at Smith Point West was projected to be 2,500 people on the beach. The current Monthly Public Use Report (MPUR) visitation figures for the East District and Wilderness Visitor Center have shown that actual visitation is far less than what was proposed as a maximum capacity. (See Appendix A.)

Traditional visitor use in the “High Dune Management Unit” prior to wilderness designation included day hiking, sunbathing, limited camping and backpacking, and regulated hunting. All of these activities have continued under additional regulation since the Fire Island Wilderness was designated and are monitored through random and recurring patrols conducted by visitor and resource protection park rangers. Camping was limited to behind the primary dune due to safety concerns related to mixing beachfront camping use with seasonally permitted off-road driving on the beach front.

From 2008 to 2010, Seashore staff permitted camping on the Atlantic Ocean beach in front of the Fire Island Wilderness as well as in the wilderness area. The 2008 Draft Superintendent’s Compendium for Fire Island National Seashore included the establishment of optional backcountry camping on the Atlantic Ocean beach in front of the Fire Island Wilderness from March 15 through Labor Day. In 2009, discussion of developing a wilderness character monitoring program was initiated by Seashore resource management and visitor and resource protection staff to identify and measure the four qualities of wilderness character as defined by the Wilderness Act for Fire Island Wilderness. After three summers of monitoring camping on the beach in addition to camping in the designated wilderness, Seashore staff documented minimal adverse impacts to area resources.

Backcountry camping use at Fire Island National Seashore has gradually increased over the years. A growing awareness of the availability of Fire Island Wilderness backcountry camping is attributed to promotion on the internet (Recreation.gov), print media, word of mouth, and most recently through social media.

Fire Island National Seashore’s 2011 revised backcountry camping policy addressed issues of personal health and safety and visitor satisfaction by extending backcountry camping to the Atlantic Ocean beach in front of each wilderness zone. Allowing for camping on the beach during the specified dates (instead of behind the dunes as required in the 1984 wilderness camping policy) reduces exposure to mosquitoes and ticks among both campers and Seashore staff who must monitor campers. Campers may select a beach campsite when off-road vehicle (ORV) driving is suspended for protection of nesting shorebird pecies, which is March 15 through Labor Day. This is also the period when ticks and mosquitoes are most active. Every camper will be alerted to precautions that must be taken to protect threatened and endangered species.

A. Access to Fire Island Wilderness and adjacent Great South Beach

The only method of access for camping in the Fire Island Wilderness or the adjacent Atlantic Ocean Beach is by foot. Transportation up to the backcountry areas and wilderness boundaries can be accomplished in a variety of ways.

- Ferry transportation is available seasonally from Patchogue to Watch Hill, where one can hike to camping areas on the Atlantic Ocean Beach or via remnants of the Burma Road.
- Parking by special permit is available at the Wilderness Visitor Center, where one can hike in along the Atlantic Ocean Beach or via remnants of the Burma Road.
- Public transportation is available via the Long Island Railroad (LIRR) to Patchogue or Mastic/Shirley. Suffolk County Transit System provides bus service to Patchogue and to Smith Point County Park, adjacent to the Wilderness Visitor Center.
- When a breach exists in the wilderness, access to each camping zone may not be possible from either the east or west access route, depending upon the location of the breach.
- Visitors can access the wilderness boundary via boat from the Great South Bay. Campers must obtain a backcountry camping permit in advance. Non-motorized craft such as canoes and kayaks may be hauled/pulled up onto the bayside shoreline. Motorized vessels would need to be anchored off shore.

To enter the Fire Island Wilderness, campers can use either established dune crossings, low areas in the dune line, deer trails, or breaks in the marsh vegetation along the bay. Areas closed to protect Threatened and Endangered Species are marked by symbolic fencing and are closed to the public. Campers must avoid entering those areas marked by rope and closure signs. ORVs are not permitted to transport visitors and equipment to access the Fire Island Wilderness along the Atlantic Ocean Beach for the purpose of camping.

National Seashore staff will monitor the impacts of overnight use on wilderness character. The number of campers and permits may be reduced or adjusted as the conditions of the Wilderness and its fauna and flora (e.g., threatened and endangered species) change. The number of overnight stays will not be increased without appropriate public review and environmental compliance. Resource Management and Visitor and Resource Protection staff will work together to determine whether additional areas should be closed to camping or whether camping zone boundaries should change. Specific policies regarding overnight use will be determined in the Fire Island National Seashore Backcountry Camping Policy or through the Superintendent's Compendium.

B. Day Use

Some of the primary uses of the Fire Island Wilderness include hiking and sunbathing. Horseback riding may be considered in the future by permit, but will need to be evaluated and monitored for resource impacts. Collecting of specified quantities of beach plums and blueberries occurs and is allowed throughout the park by Superintendent's Compendium designation, including within the Fire Island Wilderness. Some traditional use occurs by the Shinnecock and Unkechaug tribes. The Seashore will work with native tribes to accommodate traditional uses in wilderness, including collecting and ceremonial activities.

C. Hunting

Hunting within Fire Island National Seashore is authorized by the Seashore’s enabling legislation, is in accordance with New York State law, and is regulated in the area by the Superintendent’s Compendium. Hunters are required

to obtain an NPS hunting permit. Currently, only waterfowl hunting is permitted; however, other types of hunting may be permitted in the future pending evaluation of resource impacts.

D. Overnight Use: Wilderness /Backcountry Camping

All backcountry camping at Fire Island National Seashore is primitive camping, defined as an overnight stay by which access is gained by foot and where facilities are minimal. The park offers a primitive and unconfined recreation experience in its backcountry and wilderness camping areas.

Wilderness Campsite

On Long Island, primitive camping in a wilderness setting is presently available only at Fire Island National Seashore. The Seashore permits primitive/dispersed camping, in which campers may choose their own campsites within one of two wilderness zones. The two zones are generally described below, although in the event of a breach, multiple breaches, or other natural events that in some way necessitate changing the camping zones and their capacities, the Seashore will adjust the camping zone/capacity descriptions and the camping areas, as appropriate. Although established campsites exist at Watch Hill and Smith Point County Park, both adjacent to the NPS-designated wilderness, these are not primitive camping venues.

Eastern Camping Zone

The Eastern zone begins approximately 1.75 miles west of the Smith Point Wilderness Visitor Center (about 1,000 feet west of the initial location of the Old Inlet Breach created by Superstorm Sandy in 2012) and stretches to 1,000 feet east of the Bellport Beach boardwalk/trail. Campsites may be selected north of the primary dune line year-round, or on the beach from March 15 through Labor Day.

Camping Capacity

a. The maximum number of campers permitted to camp in the eastern zone at any one time is 12.
b. The maximum number of campers allowed in one camping group at one campsite is 4.
c. Maximum length of stay is three consecutive nights.

Western Camping Zone

The Western zone extends 1,000 feet west of the Bellport Beach boardwalk/trail to Long Cove (approximately 1 mile east of the eastern most beach access at Watch Hill). Campsites may be selected north of the primary dune line year-round, or on the beach from March 15 through Labor Day.

Camping Capacity

a. The maximum number of campers permitted in the western zone at any one time is 24.
b. The maximum number of campers allowed in one camping group at one campsite is 8.
c. Maximum length of stay is three consecutive nights.

The primary dunes, other ecologically sensitive areas, and areas marked by symbolic fencing for threatened and endangered species are closed to all access, including camping. The zones and camper numbers will be evaluated annually, and camper numbers may be re-evaluated and revised based on impacts to the resources and other factors.

E. Scientific Activities

Science and research are a stated purpose of wilderness and are essential for its preservation, as it can help provide a scientific basis for planning, operations, management, education, and interpretive activities.

Scientific activities will be encouraged in the Fire Island Wilderness, provided that the benefits of what may be learned outweigh the negative impacts on wilderness character. Managers need to be aware of and guard against cumulative impacts on both the resource and overall wilderness character that may result from scientific research over time. Fire Island National Seashore will ensure that researchers understand that the conduct of their research should be in accord with the preservation of wilderness character. Evaluation of applications for research and other scientific work in National Park Service wilderness should first determine that the research cannot be conducted outside the wilderness boundary, confirm that it demonstrates a positive benefit to wilderness character, and include a minimum requirements analysis (utilizing the appropriate Minimum Requirements Decision Guide-MRDG) of the project's methodologies. Researchers will be required to remove any installations immediately following the conclusion of their use.

V. Wilderness Character

Approximately 60 miles away from New York City's Times Square lies a unique haven, the Fire Island Wilderness, which has been afforded the highest level of protection by Congress. A strong vitality and dynamism is paradoxically integral to this respite from city life. Waves tumble tremendous quantities of sand upon Fire Island daily. Even the dunes themselves are on the move, shifting with the wind. Salt marshes teem with life along the fringes of the bay, and nesting shorebirds seek refuge among the dunes and washovers, always keeping a watchful eye out for predators. White-tailed deer travel quietly through the area and are as startled by people as people are by them. Here visitors can escape urban pressures and wander for miles through rolling dunes and native grasses to hear the rhythmic roar of the waves and enjoy uninterrupted views of sand, scrub, and sea. In the Fire Island Wilderness, forces of nature are allowed to take their course, creating a refuge for wildlife and people alike.

To preserve the unique spirit of each wilderness, Congress passed the 1964 Wilderness Act. Although not explicitly defined within the Act, wilderness character can be described as the combination of biophysical, experiential, and symbolic ideals that distinguishes wilderness from other lands. These ideals combine to form a complex and subtle set of relationships among the land, its management, its users, and the meanings people associate with the land. The following section discusses the wilderness character of the Fire Island Wilderness and describes what is distinctive and special about this place, as well as highlighting issues that could be addressed to preserve wilderness character. For the purpose of monitoring and managing wilderness responsibly, an interagency team developed a national framework in 2008, using four main qualities derived from the language of the Wilderness Act. These four qualities are equally important and must be thoughtfully considered in all decisions made affecting the wilderness:

Untrammeled: Wilderness is essentially unhindered and free from modern human control or manipulation

Natural: Wilderness maintains ecological systems that are substantially free from the effects of modern civilization

Undeveloped: Wilderness retains its primeval character and influence and is essentially without permanent improvements or modern human occupation

Opportunities for Solitude or Primitive and Unconfined Recreation: Wilderness provides outstanding opportunities for remoteness from sights and sounds of people and modified areas, for self-reliant recreation, and freedom from restrictions on visitor behavior

The Untrammeled Quality

The untrammeled quality of the Fire Island Wilderness is most evident in the prevailing force of the wind and waves, perhaps the most fundamental and vital process in the geomorphology of Fire Island. Massive dunes are constantly shifting, along with the island itself. Due to the removal of former residential structures and other developments, the natural vegetation has been allowed to reclaim the landscape, returning it to a truly wild place. Now the Fire Island Wilderness thoroughly "appears to have been affected primarily by the forces of nature," and the "earth and its community of life are untrammeled by man." As "trammel" refers to a restraint for a horse, untrammeled in the wilderness sense connotes an area that is unhindered by modern people. A noticeable lack of signs and structures in the wilderness supports this quality, which could also be said to represent the "wild" in wilderness. Any intentional or unintentional, authorized or unauthorized treatment or action that manipulates a wilderness is a hindrance by modern people and therefore impairs this quality.

Perpetuating the untrammeled quality requires managers to restrain themselves, rather than restraining the wilderness. There are no designated campsites in the Fire Island Wilderness; trailheads are cleared and prominent, but trails through the wilderness are minimally maintained; and minimal signage is provided. Upholding the untrammeled quality can often detract from another wilderness quality, such as naturalness, or vice-versa. For example, non-native invasive species may be removed in order to attain natural species composition, which would in turn be a manipulation of the current wilderness.

The most common actions that detract from the untrammeled quality in the Fire Island Wilderness are authorized management actions such as the removal of non-native invasive plant species, including the Japanese black pine (*Pinus thunbergii*) and autumn olive (*Elaeagnus umbellata*). However, the removal of non-native invasive plants and the reintroduction of their native counterparts would perhaps have a longer-term positive effect on the natural quality of the wilderness. Similarly, the suppression of naturally ignited fires would also detract from the untrammeled quality.

Natural Quality

The southern boundary of the Fire Island Wilderness is characterized by primary dunes, some nearly 40 feet high, that are thickly blanketed with beach grass. North of these dunes (heading towards the bay) lies the island swale and, in some areas, a line of secondary dunes. A variety of plant communities are found in the dune and swale zones, including scrub and grasslands, high thickets, pine woodlands, and occasional patches of maritime forest.

Interspersed among the dunes are unique freshwater bogs and marshes. Vast expanses of grasslands and tidal salt marsh stretch beyond the swale and secondary dunes, extending into the Great South Bay. The most extensive tidal marsh areas of the Seashore lie within the Fire Island Wilderness. These marsh areas are highly productive biological systems and provide habitat for a variety of reptiles, mammals, birds, and insects. Tidal

marshes also provide habitat for many inter-tidal and marine organisms and are the nursery grounds for various finfish and invertebrates. The marshes further provide very effective buffers against wave energy and protect adjacent uplands from erosion and saltwater intrusion by dissipating wave and tidal energy. For these reasons, as well as aesthetics, it is imperative that the Seashore preserve in as nearly a natural state as possible the remaining marsh lands of Fire Island Seashore and particularly those within the Fire Island Wilderness.

Mammals, reptiles, amphibians, insects, and birds inhabit the Fire Island Wilderness. Mammals include white-tailed deer (*Odocoileus virginianus*), cottontail rabbit (*Sylvilagus floridanus*), muskrat (*Ondatra zibethicus*), meadow vole (*Microtus pennsylvanicus*), and red fox (*Vulpes vulpes*). Several species of turtles, snakes, and toads inhabit the dunes and marshes, such as the Eastern mud turtle (*Kinosternon subrubrum*), black racer (*Coluber constrictor*), and Fowler's toad (*Bufo fowleri*). Fire Island Seashore, and the Fire Island Wilderness in particular, is located along the Atlantic Flyway and provides refuge to a variety of both migratory and resident bird species.

The natural quality of the Fire Island Wilderness, however, has been diminished by internal and external forces. Its proximity to densely populated areas affect air and water quality, as well as other biophysical processes. Several species found on Fire Island are threatened and endangered, including the federally threatened piping plover (*Charadrius melodus*), state-listed least tern (*Sternula antillarum*) and common tern (Sterna hirundo), and a federally threatened beach plant, seabeach amaranth (*Amaranthus pumilus*). Seabeach amaranth, the Eastern mud turtle (*Kinosternon subrubrum*), piping plover, and roseate tern (*Sterna dougallii*) are New York State-endangered, and the least tern (*Sternula antillarum*) and common tern (*Sterna hirundo*) are New York State-threatened. Several plants rare to New York State can also be found in the Fire Island Wilderness, such as seaside knotweed (*Polygonum glaucum*). Piping plovers, least terns, and seabeach amaranth plants nest and grow in the Wilderness near the toe of the primary dune in certain sections and in overwash areas where primary dunes used to be present.

The natural quality of the Fire Island Wilderness is still recovering from previous human occupation and disturbance; salt marsh mosquito ditches from the 1930s-50s, ornamental plantings around old homes, broken glass and debris, and water well and utility remnants detract from natural qualities. However, the area is still largely composed of native species and continues to provide habitat for much of Fire Island's wildlife. Rhizomatous grasses deposit rhizomes and anchor their roots along the dunes, and animals utilizing this small-scale habitat then spread new seeds. Salt-tolerant vegetation thrives on the growing dunes, which block the salt spray and allow pioneering species like beach heather (*Hudsonia tomentosa*) to thrive and build soils, allowing thickets to form. This delicate cycle continues, supported by this extraordinary landscape, and contributes to a rare and valuable natural quality in the Fire Island Wilderness.

Undeveloped Quality

Over the past several decades, the undeveloped quality of the Fire Island Wilderness has vastly improved. Many modern human developments have been removed, such as former residential structures and their associated sand roads, vehicle cuts, and the access road to Watch Hill, the former Watch Hill horse stable and maintenance yard and the access roads leading to them, and the former Long Cove boardwalk nature trail. The Burma Road, once a well-defined network of east-west off-road vehicle trails, has been transformed into a primitive footpath and hiking trail. Due to the history of heavy human influence in the Fire Island Wilderness, however, there are still opportunities to improve the undeveloped quality.

Boardwalks, dune crossings, signs, and posts can be found here, although the majority of these are in place to protect resources, preserving the natural quality of the Fire Island Wilderness. Several non-culturally significant structures remain, however, and large quantities of debris exist, either as remains of old settlements or the current high user density on the beach adjacent to the Wilderness. Electric lines that are no longer active stretch along the length of the Wilderness. Even still, the Wilderness remains an exceptional retreat from surrounding urban areas, with relatively little evidence of modern human occupation.

Opportunities for Solitude or Primitive and Unconfined Recreation Quality

Although the Fire Island Wilderness is not among the larger areas in the National Wilderness Preservation System, its isolation from the mainland amplifies the feeling of solitude. In many cases, even visual access to the mainland of Long Island is completely cut off by fog, the secondary dunes, or by tall vegetation behind the primary dune. The physical character of the Seashore and its vegetation provide visitors to this area an experience combining both isolation and enclosure.

As the user density within the Wilderness is relatively low, threats to solitude mostly originate from outside. Motorized access along the beach and bay, as well as air traffic, detract from one's sense of solitude. Large numbers of people entering the Wilderness, particularly near access points on the east and west end, can have a similar effect. In addition, proximity to New York City and other urban areas has a significant effect on night sky visibility. The Seashore attempts to minimize the impact of its own light fixtures, as the night sky remains a valuable experience in this Wilderness. An overnight visitor looking north may notice that the lights of Long Island make it difficult to view stars, but one only needs to turn 180 degrees to see a magnificent array of stars to the south over the Atlantic Ocean.

The Wilderness also provides a rare opportunity for unconfined recreation. It is one of the few places in the region to offer primitive camping, and limited trail maintenance contributes to opportunities for visitors to explore a wild, natural area with minimal human influences (briars and tangles of dense vegetation, poison ivy, mosquitoes, ticks, marshes, and uneven surfaces will be encountered) for which the user must be prepared. Facilities and actions that decrease self-reliant recreation, such as dune crossings, trail markers, and development of user trails, detract from this quality. In addition, limitations on user behavior, such as the prohibition of campfires and restricted access to dunes also limit unconfined recreation. Current restrictions are in place for the protection of visitors and are critical for the protection of the resources; however, managers should carefully consider the impacts to this quality when imposing any additional restrictions.

Cultural Resources

Cultural resources are not currently included in the four primary qualities of wilderness character, yet cultural resources and wilderness are indisputably related. There is a significant history of human use in this area and other wildernesses prior to designation, which may have produced archeological sites, historic structures and artifacts, cultural landscapes and associated features, objects, and traditional cultural properties that contribute to our appreciation of wilderness. Cultural resources are an integral part of wilderness and can contribute to wilderness character.

The 1980 Fire Island Wilderness Study documented several areas of cultural and historic interest that either currently or formerly existed in the area, such as a whaling station that operated at Whalehouse Point during the late 17th and 18th centuries, two lifesaving stations dating from the mid-1800's, and several beach cottages. An early fishing village and eventually a small summer community were developed at Long Cove in the late 19th century. Any culturally significant resources that are discovered will be preserved and protected, and Fire Island National Seashore will continue to work with native tribes to accommodate traditional uses, including but not limited to ceremonial practices and collecting.

VI. WILDERNESS MANAGEMENT

The Fire Island Wilderness will be managed so as to preserve the wilderness character for future generations. The natural flora, fauna, and physiographic conditions of this unique area will be preserved in a primitive state, and the entire Wilderness will be administered as a natural ecosystem in which the influence of humans is minimal and the character of the area is instead molded by the forces of nature.

Evidence of previous human actions will continue to be removed or allowed to be reclaimed by nature. Before projects are undertaken, Fire Island National Seashore will conduct the necessary and required compliance appropriate to the proposed action, in accordance with Director's Order 12, the National Environmental Protection Act, and the National Historic Preservation Act of 1966, as amended.

A . Wilderness Character Monitoring

Wilderness character will be monitored to improve wilderness stewardship by providing managers with a tool that can be used to evaluate how selected actions and conditions affect wilderness character over time. Fire Island National Seashore has selected a suite of indicators and measures related to each of the four qualities of wilderness character, based on the interagency monitoring strategy called *Keeping It Wild*. The overall approach of this monitoring strategy is to: 1) choose a set of measures that are relevant, cost-effective, and tied to preserving wilderness character; 2) periodically collect data to assess trends in these measures; and 3) use these trends to assess and report on the overall trend in wilderness character.

Indicators, measures, and protocols selected by Fire Island National Seashore can be found in Appendix D, Monitoring Trends in Wilderness Character of the Otis Pike Fire Island High Dune Wilderness. These are subject to revision, as measures and protocols may be revised, added, or removed. Wilderness character will continue to be monitored, and data will be entered into the national Wilderness Character Monitoring Database.

B. Use of the Minimum Requirements Analysis

National Park Service Management policies (Sections 6.3.1 and 6.3.5) require the application of the concept of "minimum requirement " for the administration of the wilderness area regardless of wilderness category (designated, recommended, proposed, eligible for study, and potential). All parks with wilderness must have a documented process for applying a two-step minimum requirements concept analysis that adequately considers impacts to wilderness character. The Seashore will use the most current version of the Minimum Requirements Decision Guide worksheets developed by the Arthur Carhart National Wilderness Training Center. This minimum requirement analysis (analysis) must be applied to all administrative activities that could affect wilderness

character, including activities that are not specifically prohibited by section 4(c) of the Wilderness Act (16 USC 1133 (c)).

The analysis will be completed by an interdisciplinary team before the action takes place and will thoroughly consider the necessity of the action within wilderness. If the action is determined necessary, the National Park Service will select the alternative that results in the least impact on wilderness character. In the past, this was referred to as the "minimum tool," but is now generally referred to as the "minimum activity," because factors other than the type of tools used are also important when deciding on how best to preserve wilderness character (e.g., mode of transport, season, etc.).

When determining minimum requirements, the potential disruption of wilderness character and resources will be considered before—and given more significance than—economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable (2006 NPS Management Policies 6.3.5).

C. Potential Wilderness Additions

Two potential wilderness additions totaling one acre within the Fire Island Wilderness (at Old Inlet and Smith Point) after the 17-acre addition in 1999. This one acre was managed by the Seashore so as not to preclude their official designation as wilderness.

The existing structures at Old Inlet were lost during Super Storm Sandy in 2012 and will not be replaced. This one acre potential wilderness at Old Inlet and Smith Point was added to the designated wilderness through notification in the Federal Register by the Secretary of the Interior in 2014, completing the 1,380 acres as stated in the 1980 legislation.

Old Inlet

The Old Inlet facilities (dock, boardwalk, dune crossing, and dehydrating toilet) were destroyed during Super Storm Sandy in November 2012 and will not be reconstructed. No structures currently exist that preclude wilderness designation.

Smith Point West Nature Trail

The Smith Point West Nature trail consists of a wooden elevated boardwalk. This trail originates from the Wilderness Visitor Center at the eastern wilderness boundary and provides access to three different habitats (swale, dune, and maritime forest). Portions of the trail near the bay were destroyed by ice and were removed in 2000. The Smith Point trail allows universal accessibility and offers visitors the opportunity to experience various habitats and a changing dune environment to which they might not otherwise have access. The only other remaining structures at Smith Point are three concrete pads.

D. Utility Companies

The Wilderness currently includes the underground utility lines of the Long Island Power Authority (LIPA) and the lines of the New York Telephone Company, which run along the footprint of the old Burma Road for the entire

length of the Wilderness. As these utilities are no longer active, this activity has been considered an abandoned use. Therefore, the Seashore will discuss with the utility companies the future removal of the right of way and the respective easements. The utility lines will be removed as soon as resources become available. Utility rights of way will not be renewed in the Wilderness, and the NPS will work with the utility companies to determine the extent at which the utilities or the NPS has the responsibility to remove the infrastructure.

E. Commercial Services

No commercial services currently exist, but may be considered in the future "to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the area" (The Wilderness Act). Commercial services may be considered if they are determined necessary and proper for providing educational information about wilderness uses, resources, or values, or are necessary for other wilderness purposes in which benefits outweigh the negative impacts to wilderness character (Director's Order 41: Wilderness Preservation and Management).

F. Motorized and Mechanical Use

The use of motor vehicles and mechanical equipment by the public will not be permitted. Use of motor vehicles and mechanical equipment by federal, local, and state agencies will not be permitted except in emergencies and when there is absolutely no viable alternative. Emergencies may include evacuating severely sick and injured visitors (when the seriousness of the condition precludes the use of a litter), controlling wild or structural fires, or evacuating people during severe storms when travel on the beach is not possible. Any emergency use will be approved by the Superintendent of Fire Island National Seashore or his or her official designee. This plan does not restrict federal, state, or local official vehicles or other permitted off-road vehicles and vessels parallel to the Wilderness along the Atlantic Ocean Beach within current regulations of the Seashore as outlined in 36 CFR 7.20.

Emergency operations could impact all four qualities of wilderness character, so prevention is essential. Education and risk management can therefore improve both visitor safety and wilderness character.

G. Restoration

Fire Island National Seashore has removed the majority of the remnants of modern human occupation and largely restored the Wilderness to its natural state. However, some remain, particularly around sites at which the NPS previously attempted to remove non-compliant structures. It will be a priority for the NPS to remove all developments and debris with the exception of remains that are culturally significant, such as those pertaining to maritime history.

Non-native invasive plant species within the Wilderness will be assessed and may be removed. All rehabilitation projects will be fully evaluated using the Minimum Requirements Analysis process and will be documented utilizing a set of monitoring protocols that include photographs before and after corrective action.

H. Fire Management

Most natural fires are caused by lightning and are recognized as natural phenomena that must be permitted to continue if natural systems are to be perpetuated. Suppression of naturally ignited fires is considered trammeling, and is therefore considered to degrade wilderness character. The National Park Service fire management policies and the Fire Island Wildland Fire Management Plan (FMP) allow prescribed naturally ignited (lightning) fires to burn, provided that they contribute to the attainment of Seashore and/or Wilderness management objectives. The FMP was designed to meet Seashore resource management objectives while ensuring that firefighter and public safety are not compromised.

Human-ignited fires are the most common type of fires at Fire Island National Seashore and often destroy Seashore resources. Suppression of a human-ignited fire would not be considered degradation of wilderness character.

Wilderness character will be adequately protected during all fire management actions. Future revisions of the FMP will include a minimum requirements analysis, which will also be completed to address specific activities (methods or tools) for individual events or planned ignitions, as well as for actions that may be needed to restore, stabilize, or rehabilitate an area following fire.

I. Wildlife and Vegetation Management

Any authorized or unauthorized effort to manipulate biophysical processes, including flora and fauna, within the Wilderness, is considered trammeling. However, often a short-term compromise in untrammeled quality can result in a long-term improvement to natural quality. With this in mind, managers should carefully weigh the effects of their decisions and implementing actions on the wilderness character.

Fire Island National Seashore has developed a Mosquito Management Plan that should be referred to for actions affecting mosquito management. The Seashore will continue to monitor mosquitoes and allow existing mosquito ditches to naturally recover, as per the recommendations of research conducted in 2009[2]

Fire Island National Seashore is in the process of developing a White-tailed Deer and Vegetation Management Plan to provide guidance if it becomes necessary to control the growing population of white-tailed deer, which may be affecting native vegetation.

Under the Seashore's Piping Plover Monitoring and Management program, symbolic fencing and predator exclosures protect the federally threatened piping plover and its habitat. Due to the decreased anthropogenic disturbances to plovers nesting in or adjacent to the Wilderness, the number of plovers nesting in these areas is significantly greater than in other areas of the island. Preservation of threatened and endangered species greatly increases the natural quality of wilderness character.

[2] Corman, S.S., C. T. Roman, J.W. King, and P.G. Appleby. 2012. Salt marsh mosquito-control ditches: sedimentation, landscape change and restoration implications. Journal of Coastal Research 28: 874-880.

Vegetation in the Fire Island Wilderness is largely native. Fire Island Seashore staff continually monitors for non-native invasive species, and the Seashore has adopted management actions to mitigate any new non-native species that may be transported to the area. Most non-native invasive species are managed through an Early Detection Rapid Response (EDRR) method. This kind of management will ensure that the Fire Island Wilderness maintains its relatively native state and any new non-native invasive species transported to the Fire Island Wilderness is eradicated before it can become established. In the Fire Island Wilderness, different management approaches are implemented to control non-native invasive plants that have already established themselves, such as Japanese black pine (*Pinus thunbergii*) and autumn olive (*Elaeagnus umbellata*). Many of these plants were planted by the former landowners, and efforts to remove them are implemented when resources are available. Seashore staff biologists work with local organizations throughout Long Island, such as the Long Island Invasive Species Management Area (LIISMA), which provides a list of the most aggressive non-native invasive species in the area and recommendations on how to manage them. This list is created by a scientific review committee that is comprised of botanists, plant research scientists, land managers, horticulturists, etc. Seashore staff biologists refer to the list and recommendations to direct management actions that are implemented in the Fire Island Wilderness.

Other actions may be taken in the future to manage wildlife or vegetation, including but not limited to management of threatened, endangered, rare, and/or non-native invasive species. Prior to taking management actions, the Seashore will undergo a minimum requirements analysis in which impacts to wilderness character will be thoroughly considered.

Piping Plover

J. Interpretation and Education

Wilderness character and stewardship will be incorporated into Fire Island National Seashore's interpretive, educational, and outreach programming, and are to be considered in the long-range interpretive plan and annual implementation plan. NPS wilderness-specific significance statements and interpretive themes will be incorporated into all appropriate park-planning documents. The Fire Island Wilderness Visitor Center and, to a lesser degree, the Watch Hill Visitor Center, will be updated to include wilderness character and stewardship information, and signs may be placed at the wilderness thresholds (outside the wilderness boundary) to educate and inform visitors about the area they are about to enter.

Staff education is an integral part of wilderness stewardship. Therefore, wilderness character training will be incorporated into all appropriate training programs for Seashore staff, including seasonal staff, cooperating association employees, concessions employees, and volunteers.

Leave No Trace (LNT) principles and practices will be applied to all forms of recreation management within the Fire Island Wilderness. LNT principles should be incorporated into interpretive activities and products such as hikes, talks, brochures, maps, and websites. NPS staff from all divisions who work in the Wilderness should attend LNT workshops and training.

Information and interpretation of the Fire Island Wilderness and its use, including camping, will be based on established guidance documents and NPS policy. Site-specific interpretive themes for the Wilderness were articulated in the 1994 Interpretive Prospectus for Fire Island National Seashore; however, these are subject to

revision as more current management documents are developed and new guidelines established. New park primary interpretive themes have been drafted for inclusion in the new GMP.

The Fire Island Wilderness is unique among federal wilderness areas due to its small size and proximity to such a large urban population. It is also the only designated federal wilderness in New York State. Topics and concepts to be explored with personal and non-personal services interpreting the Fire Island Wilderness theme include:

- The value of wilderness—what is it and why do we need it?
- Natural processes without human intrusion
- Habitat diversity and biodiversity, including endangered species
- A natural/living laboratory to provide a "control" for scientific research on the rest of Fire Island

NPS-wide significance statements established for the NPS Wilderness Education and Partnership Program (2002) are relevant to the Fire Island Wilderness. They define the important aspects of wilderness and express the fundamental rationales that provide the connections between the enabling legislation and wilderness interpretive programs at the park level. Significance statements lead directly to NPS-wide wilderness interpretive themes. All significance statements are equally important and are not presented in priority order.

a) Wilderness designation provides the highest level of legal protection for some of the most pristine and least manipulated wildlands in the United States.
b) Lands that qualify for wilderness status are a rare and diminishing resource.
c) Wilderness provides critical habitat for rare and endangered species of plants and animals as well as protection of other vital components of healthy and diverse ecosystems such as air quality, watersheds, and natural soundscapes.
d) Wilderness provides a unique learning laboratory for scientific activities and lessons that address natural systems and their preservation, ecosystem management, and stewardship.
e) Wilderness provides the opportunity to explore the societal and personal values as they relate to the use and appreciation of wildlands where humans are temporary visitors, not permanent residents.
f) Wilderness contains exceptional qualities such as scenic beauty, natural sounds, and opportunities for reflection and solitude that are important for human inspiration and rejuvenation.
g) The designation and management of wilderness affords opportunities to explore such concepts as preservation, development, history, freedom, interdependence, ingenuity, and land ethics.
h) Wilderness provides a sense of wildness, which can be valuable to people whether or not those individuals actually visit wilderness. Just knowing that wilderness exists can produce a sense of curiosity, inspiration, renewal, imagination, hope and potential.
i) Wilderness provides extraordinary and challenging recreational opportunities, allowing present and future generations the opportunity to experience, risk, reward, and self-reliance.
j) Wilderness provides opportunities for the preservation, study and further understanding of cultures and cultural resources, including those related to indigenous peoples and traditional and sacred places.

Wilderness/backcountry camping information will be communicated to campers and the general public via non-personal media that may include but would not be limited to printed material, park website, social media, an on-line reservation system, and exhibits. The information conveyed will inform campers of potential hazards within the Wilderness and on the beach, and will outline the major points of the camping policy. "Leave No Trace" ethics will be followed. Informational materials will also incorporate established NPS-wide significance statements and interpretive themes, as appropriate.

Each year any revisions to the camping policy will be communicated to the public via park website and other appropriate non-personal media venues, including press media.

Reservation System
The park may use a reservation system to manage the wilderness and backcountry camping program. This system will help manage and maintain the camping capacity for each zone. Information on the reservation system will be posted on the park's website and shared via social media. No permit fee is currently charged, but a reservation cost recovery fee will be implemented.

K. Breach Management

The legislation establishing the Fire Island Wilderness, and hence this plan, does not preclude the repair of breaches that may occur in the Wilderness in order to prevent loss of life, flooding, and other severe economic and physical damage to the Great South Bay and surrounding area. Prior to repair of any breach within the Wilderness, the appropriate level of NEPA compliance will be prepared.

VII. MANAGEMENT FACILITIES

A. Roads, Trails and Vehicle Cuts
The Burma Trail is a system of abandoned off-road vehicle access routes running the length of the Fire Island Wilderness. Since the 1983 Wilderness Management Plan, it has been left to revert to a natural state, with only visitor use maintaining it as a primitive footpath. Through time this east-west route has been reshaped by the dynamic natural processes of the barrier island. Remnants of the trail exist in some areas, while in others the dunes have rolled over the trail, or vegetation has overgrown any visual evidence of its previous trace alignment.

Wilderness is primitive and unconfined; the Seashore will promote the values of self-reliance and discovery by not maintaining the full extent of the remnant Burma Trail or pre-existing spur trails. Trailheads adjacent to the Wilderness boundary will concentrate visitor use on the Burma Trail to begin their journey into the Wilderness if they so choose. Trails beginning at trailheads and other points of interest will be permitted to develop only to that of a Class 1 Wilderness, single lane 0"-12" width, as per Federal U.S. Forest Service Trail Class standards. The Burma Trail will be minimally maintained by the Seashore near the eastern and western access of the Wilderness to create a transition between the maintained trails of adjacent lands and the unconfined Wilderness. However, access to the Wilderness can take place from any point, not just the Burma Trail, and the Seashore will encourage unconfined exploration of and recreation in the Wilderness, allowing visitors to experience the Wilderness largely on its own terms.

In areas where the Burma Trail has reverted to its natural state, the visitor can utilize dispersed travel and game trails. The Seashore will not allow any new trails that meet or exceed the Class 1 standard.

B. Pedestrian Dune Crossings
There were two pedestrian dune crossings in the Wilderness before Super Storm Sandy in 2012: one approximately 1,400 feet west of Smith Point and another at the Old Inlet facility. NPS will not retain these facilities. Due to the dynamic nature of the dunes, temporary markers may be placed on the beach face to indicate appropriate places for visitors to access the Wilderness and to be relocated as the dunes themselves shift or as required to control egress from the Wilderness to areas of the beach that are closed for the protection of threatened or endangered species.

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C. Signs

As a result of the high concentration of visitors within the first mile to mile and a half east of Watch Hill, the existing "Keep Off The Dunes" signs will be retained. Additional signs may be necessary to protect threatened or endangered species and their habitat. Areas of interest may be marked by GPS coordinates coinciding with historic telephone markers, and may be accompanied by an interpretive wilderness guide. The Seashore will utilize signs only where absolutely necessary for the protection of the resource or to ensure the safety of the Wilderness visitor. Signs will be of the smallest size and minimum number necessary to accomplish the objective. Potential signs will be fully evaluated to determine their necessity, number, and location and will be constructed in compliance with the NPS sign system specifications. Every effort will be made to ensure signs blend with the natural environment to the maximum extent possible and be posted during appropriate times for resource protection needs.

Telephone Marker

D. Navigational Aids

The Watch Hill channel markers are two pole-mounted electrically powered lights within the Wilderness adjacent to the western boundary and Great South Bay. This facility requires little maintenance and is necessary to ensure safe access by boats into the Watch Hill channel. The channel markers are an existing, non-conforming use and will remain. If, in the future, it is determined that these markers are no longer necessary to ensure safe access, they will be removed.

E. Fire Island Wilderness Visitor Center

The existing Fire Island Wilderness Visitor Center, located outside of the Wilderness boundary, serves as a critical gateway to both the Wilderness and the eastern segment of the park. Every effort will be made to keep the visitor center open year-round and staffed with interpreters to issue hunting, sportsman's driving, and camping permits, as well as to educate visitors about the Wilderness, wilderness character and values, outdoor ethics, and park-wide resources, significance, and programs.

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APPENDIX A: Fire Island National Seashore Enabling Legislation

PUBLIC LAW 88-587
88th Congress
September 11, 1964

AN ACT

TO ESTABLISH THE FIRE ISLAND NATIONAL SEASHORE, AND FOR OTHER PURPOSES

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That

Fire Island National Seashore Establishment

(a) for the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features within Suffolk County, New York, which possess high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban population, the Secretary of the Interior is authorized to establish an area to be known as the "Fire Island National Seashore".

Boundaries

(b) The boundaries of the national seashore shall extend from the easterly boundary of Robert Moses State Park eastward to Moriches Inlet and shall include not only Fire Island proper, but also such islands and marshlands in the Great South Bay, Bellport Bay, and Moriches Bay adjacent to Fire Island as Sexton Island, West Island, Hollins Island, Ridge Island, Pelican Island, Pattersquash Island, and Reeves Island and such other small and adjacent islands, marshlands, and wet lands as would lend themselves to contiguity and reasonable administration within the national seashore and, in addition, the waters surrounding said area to distances of one thousand feet in the Atlantic Ocean and up to four thousand feet in Great South Bay and Moriches Bay, all as delineated on a map identified as "Fire Island National Seashore No. OGP-0002", dated June 1964. The Secretary shall file said map with the Federal Register, and it may also be examined in the offices of the Department of the Interior.

SECTION 2

Acquisition of land.
78 Stat. 928
78 Stat. 929

(a) The Secretary is authorized to acquire, and it is the intent of Congress that he shall acquire as appropriated funds become available for the purpose or as such acquisition can be accomplished by donation or with donated funds or by transfer, exchange, or otherwise, the lands, waters, and other property, and improvements thereon and any interest therein, within the boundaries of the seashore as established under Section 1 of this Act. Any property or interest therein owned by the State of New York, by Suffolk County, or by any other political subdivision of said State may be acquired only with the concurrence of such owner. Notwithstanding any other provision of law, any Federal property located within such area may, with the concurrence of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for use by him in carrying out the provisions of the Act. In exercising his authority to acquire property in accordance with the provisions of the subsection, the Secretary may enter into contracts requiring the expenditure, when appropriated, of funds authorized by the Act, but the liability of the United States under any such contract shall be contingent on the appropriation of funds sufficient to fulfill the obligations thereby incurred.

Publication in Federal Register

(b) When the Secretary determines that lands and waters or interests therein have been acquired by the United States in sufficient quantity to provide an administrative unit, he shall declare the establishment of the Fire Island National Seashore by publication of notice in the Federal Register.

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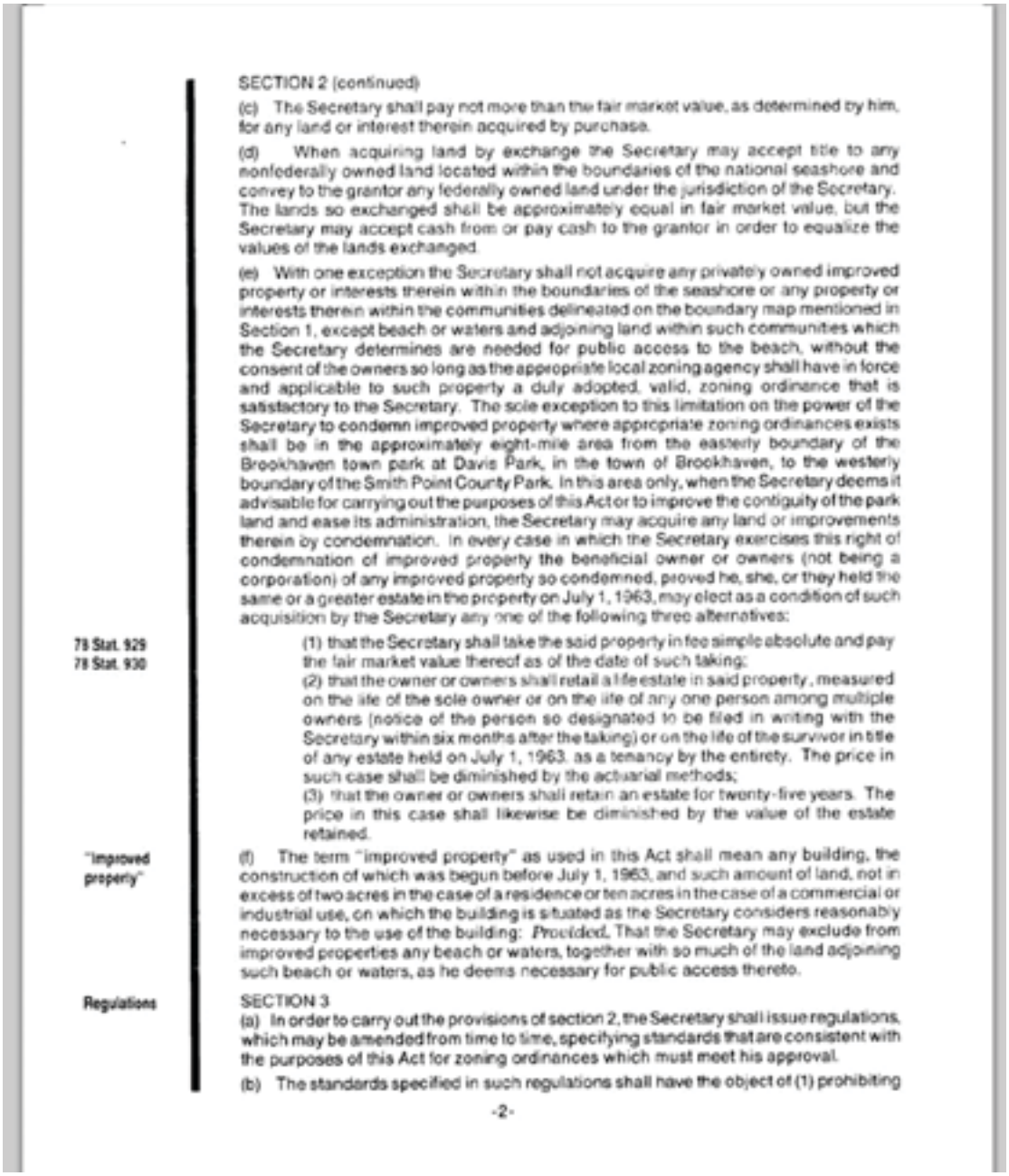

SECTION 2 (continued)

(c) The Secretary shall pay not more than the fair market value, as determined by him, for any land or interest therein acquired by purchase.

(d) When acquiring land by exchange the Secretary may accept title to any nonfederally owned land located within the boundaries of the national seashore and convey to the grantor any federally owned land under the jurisdiction of the Secretary. The lands so exchanged shall be approximately equal in fair market value, but the Secretary may accept cash from or pay cash to the grantor in order to equalize the values of the lands exchanged.

(e) With one exception the Secretary shall not acquire any privately owned improved property or interests therein within the boundaries of the seashore or any property or interests therein within the communities delineated on the boundary map mentioned in Section 1, except beach or waters and adjoining land within such communities which the Secretary determines are needed for public access to the beach, without the consent of the owners so long as the appropriate local zoning agency shall have in force and applicable to such property a duly adopted, valid, zoning ordinance that is satisfactory to the Secretary. The sole exception to this limitation on the power of the Secretary to condemn improved property where appropriate zoning ordinances exists shall be in the approximately eight-mile area from the easterly boundary of the Brookhaven town park at Davis Park, in the town of Brookhaven, to the westerly boundary of the Smith Point County Park. In this area only, when the Secretary deems it advisable for carrying out the purposes of this Act or to improve the contiguity of the park land and ease its administration, the Secretary may acquire any land or improvements therein by condemnation. In every case in which the Secretary exercises this right of condemnation of improved property the beneficial owner or owners (not being a corporation) of any improved property so condemned, proved he, she, or they held the same or a greater estate in the property on July 1, 1963, may elect as a condition of such acquisition by the Secretary any one of the following three alternatives:

78 Stat. 929
78 Stat. 930

(1) that the Secretary shall take the said property in fee simple absolute and pay the fair market value thereof as of the date of such taking;
(2) that the owner or owners shall retain a life estate in said property, measured on the life of the sole owner or on the life of any one person among multiple owners (notice of the person so designated to be filed in writing with the Secretary within six months after the taking) or on the life of the survivor in title of any estate held on July 1, 1963, as a tenancy by the entirety. The price in such case shall be diminished by the actuarial methods;
(3) that the owner or owners shall retain an estate for twenty-five years. The price in this case shall likewise be diminished by the value of the estate retained.

"Improved property"

(f) The term "improved property" as used in this Act shall mean any building, the construction of which was begun before July 1, 1963, and such amount of land, not in excess of two acres in the case of a residence or ten acres in the case of a commercial or industrial use, on which the building is situated as the Secretary considers reasonably necessary to the use of the building: *Provided*, That the Secretary may exclude from improved properties any beach or waters, together with so much of the land adjoining such beach or waters, as he deems necessary for public access thereto.

Regulations

SECTION 3

(a) In order to carry out the provisions of section 2, the Secretary shall issue regulations, which may be amended from time to time, specifying standards that are consistent with the purposes of this Act for zoning ordinances which must meet his approval.

(b) The standards specified in such regulations shall have the object of (1) prohibiting

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Fire Island National Seashore Wilderness Stewardship Plan –Draft July 2014

SECTION 3 (continued)

new commercial or industrial uses, other than commercial or industrial uses which the Secretary considers are consistent with the purpose of this Act, of all property within the national seashore, and (2) promoting the protection and development for purposes of the Act of the land within the national seashore by means of acreage, frontage, and setback requirements.

(c) Following issuance of such regulations the Secretary shall approve any zoning ordinance or any amendment to any approved zoning ordinance submitted to him that conforms to the standards contained in the regulations in effect at the time of adoption of the ordinance or amendment. Such approval shall remain effective for so long as such ordinance or amendment remains in effect as approved.

(d) No zoning ordinance or amendment thereof shall be approved by the Secretary which (1) contains any provisions that he considers adverse to the protection and development, in accordance with the purposes of this Act, of the area comprising the national seashore; or (2) fails to have the effect of providing that the Secretary shall receive notice of any variance granted under, or any exception made to, the application such ordinance or amendment.

(e) If any improved property, with respect to which the Secretary's authority to acquire by condemnation has been suspended according to the provisions of this Act, is made the subject of a variance under, or becomes for any reason an exception to, such zoning ordinance, or is subject to any variance, exception, or use that fails to conform to any applicable effect at the time of passage of such ordinance, the suspension of the Secretary's authority to acquire such improved property by condemnation shall automatically cease.

(f) The Secretary shall furnish to any party in interest upon request a certificate indicating the property with respect to which the Secretary's authority to aquire by condemnation is suspended.

78 Stat. 930
78 Stat. 931

SECTION 4

Owners Use of Property

(a) Owners of improved property acquired by the Secretary may reserve for themselves and their successors or assigns a right of use and occupancy of the improved property for noncommercial residential purposes for a term that is not more than twenty-five years. The value of the reserved right shall be deducted from the fair market value paid for the property.

(b) A right of use and occupancy reserved pursuant to this section shall be subject to termination by the Secretary upon his determination that the use and occupancy is not consistent with an applicable zoning ordinance approved by the Secretary in accordance with the provisions of Section 3 of this Act, and upon tender to the owner of the right an amount equal to the fair market value of that portion of the right which remains unexpired on the date of termination.

SECTION 5

Hunting and Fishing

The Secretary shall permit hunting, fishing, and shell-fishing on lands and waters under his administrative jurisdiction within the Fire Island National Seashore in accordance with the laws of New York and the United States of America, except that the Secretary may designate zones where, and establish periods when, no hunting shall be permitted for reasons of public safety, administration, or public use and enjoyment. Any regulations of the Secretary under this Section shall be issued after consultation with the Conservation Department of the State of New York.

SECTION 6

The Secretary may accept and use for purposes of this Act any real or personal property of moneys that may be donated for such purposes.

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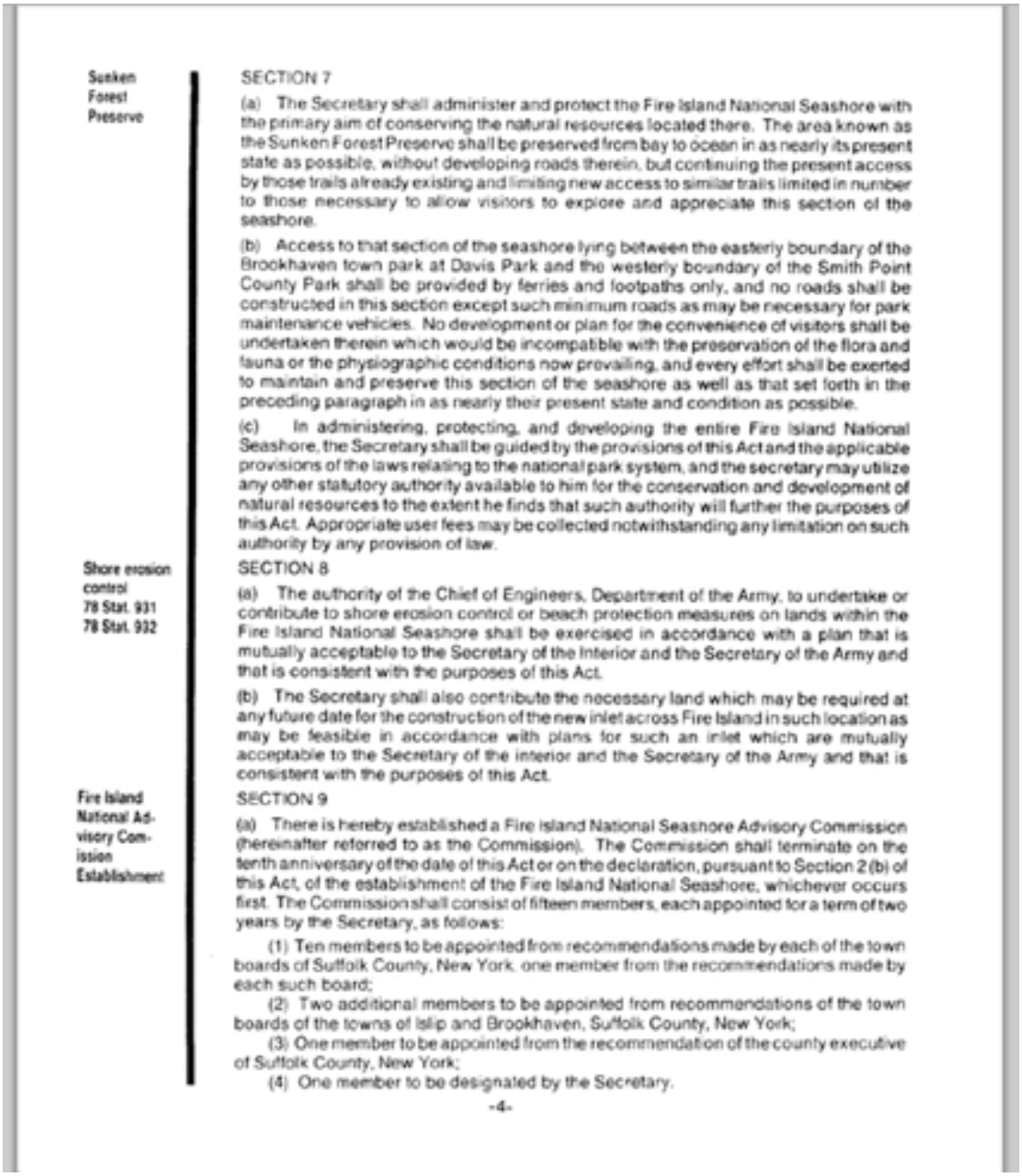

Sunken Forest Preserve

SECTION 7

(a) The Secretary shall administer and protect the Fire Island National Seashore with the primary aim of conserving the natural resources located there. The area known as the Sunken Forest Preserve shall be preserved from bay to ocean in as nearly its present state as possible, without developing roads therein, but continuing the present access by those trails already existing and limiting new access to similar trails limited in number to those necessary to allow visitors to explore and appreciate this section of the seashore.

(b) Access to that section of the seashore lying between the easterly boundary of the Brookhaven town park at Davis Park and the westerly boundary of the Smith Point County Park shall be provided by ferries and footpaths only, and no roads shall be constructed in this section except such minimum roads as may be necessary for park maintenance vehicles. No development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the flora and fauna or the physiographic conditions now prevailing, and every effort shall be exerted to maintain and preserve this section of the seashore as well as that set forth in the preceding paragraph in as nearly their present state and condition as possible.

(c) In administering, protecting, and developing the entire Fire Island National Seashore, the Secretary shall be guided by the provisions of this Act and the applicable provisions of the laws relating to the national park system, and the secretary may utilize any other statutory authority available to him for the conservation and development of natural resources to the extent he finds that such authority will further the purposes of this Act. Appropriate user fees may be collected notwithstanding any limitation on such authority by any provision of law.

Shore erosion control
78 Stat. 931
78 Stat. 932

SECTION 8

(a) The authority of the Chief of Engineers, Department of the Army, to undertake or contribute to shore erosion control or beach protection measures on lands within the Fire Island National Seashore shall be exercised in accordance with a plan that is mutually acceptable to the Secretary of the Interior and the Secretary of the Army and that is consistent with the purposes of this Act.

(b) The Secretary shall also contribute the necessary land which may be required at any future date for the construction of the new inlet across Fire Island in such location as may be feasible in accordance with plans for such an inlet which are mutually acceptable to the Secretary of the interior and the Secretary of the Army and that is consistent with the purposes of this Act.

Fire Island National Advisory Commission Establishment

SECTION 9

(a) There is hereby established a Fire Island National Seashore Advisory Commission (hereinafter referred to as the Commission). The Commission shall terminate on the tenth anniversary of the date of this Act or on the declaration, pursuant to Section 2 (b) of this Act, of the establishment of the Fire Island National Seashore, whichever occurs first. The Commission shall consist of fifteen members, each appointed for a term of two years by the Secretary, as follows:

(1) Ten members to be appointed from recommendations made by each of the town boards of Suffolk County, New York, one member from the recommendations made by each such board;

(2) Two additional members to be appointed from recommendations of the town boards of the towns of Islip and Brookhaven, Suffolk County, New York;

(3) One member to be appointed from the recommendation of the county executive of Suffolk County, New York;

(4) One member to be designated by the Secretary.

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SECTION 9 (continued)

(b) The Secretary shall designate one member to be Chairman.

(c) A member of the Commission shall serve without compensation.

(d) The Commission established by this section shall act and advise by affirmative vote of a majority of the members thereof.

(e) The Secretary or his designee shall, from time to time, consult with the members of the Commission with respect to matters relating to the development of Fire Island National Seashore and shall consult with the members with respect to carrying out the provisions of Sections 2, 3, and 4 of this Act.

Conflict of interest

(f) (1) Any member of the Advisory Commission appointed under this Act shall be exempted, with respect to such appointment from the operation of Sections 281, 283, 284, and 1914 of title 18 of the United States Code and Section 190 of the Revised Statutes (5 U.S.C. 99) except as otherwise specified in paragraph (2) of this subsection.

76 Stat. 1126

(2) The exemption granted by paragraph (1) of this subsection shall not extend--

(i) to the receipt of payment of salary in connection with the appointee's Government service from any sources other than the private employer of the appointee at the time of his appointment; or

(ii) during the period of such appointment, and the further period of two years after the termination thereof, to the prosecution or participation in the prosecution, by any person so appointed, of any claim against the Government involving any matter concerning which the appointee had any responsibility arising out of his appointment during the period of such appointment.

78 Stat. 932
78 Stat. 933

SECTION 10

Appropriation

There is hereby authorized to be appropriated not more than $16,000,000 for the acquisition of lands and interests in land pursuant to this Act.

APPROVED SEPTEMBER 11, 1964.

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Fire Island National Seashore Wilderness Stewardship Plan –Draft July 2014

APPENDIX B: Otis Pike Fire Island High Dune Wilderness Enabling Legislation

Public Law 96-585
96th Congress

An Act

To designate certain lands of the Fire Island National Seashore as the "Otis Pike Fire Island High Dune Wilderness", and for other purposes.

Dec. 23, 1980
[H.R. 7814]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in accordance with section 3(c) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132(c)), certain lands in the Fire Island National Seashore, New York, comprising approximately one thousand three hundred and sixty-three acres, and potential wilderness additions comprising approximately eighteen acres, as depicted on the map entitled "Wilderness Plan—Fire Island National Seashore", dated December 1980, are hereby designated as the "Fire Island Wilderness". The southern boundary of the wilderness shall be the toe of the primary dunes.

Otis Pike Fire Island High Dune Wilderness, N.Y. Designation. 16 USC 1132 note.

(b) As soon as practicable after this Act takes effect, a map and a description of the boundaries of the wilderness area shall be filed with the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate, and such map and description shall have the same force and effect as if included in this Act: *Provided,* That correction of clerical and typographical errors in such map and description may be made. The map and description of boundaries shall be on file and available for public inspection in the offices of the Superintendent of the Fire Island National Seashore and the Director of the National Park Service.

Boundary description and map, filing with congressional committees.

(c) Lands which represent potential wilderness additions, upon publication in the Federal Register of a notice by the Secretary of the Interior that all uses prohibited thereon by the Wilderness Act have ceased, shall thereby be designated wilderness. Pending such designation, the Secretary shall administer such lands in such manner as to preserve, insofar as is possible, their wilderness or potential wilderness character.

Potential wilderness additions, administration.

(d) Wilderness designation shall not preclude the repair of breaches that occur in the wilderness area, in order to prevent loss of life, flooding, and other severe economic and physical damage to the Great South Bay and surrounding areas.

(e) Section 10 of the Act of September 11, 1964 (78 Stat. 928) is amended by changing the period to a comma, and by adding the following: "and, after the date of enactment of this provision, not more than $500,000 for development.".

Appropriation authorization. 16 USC 459e-9.

(f) Authorizations of moneys to be appropriated under this Act shall be effective on October 1, 1981. Notwithstanding any other provision of this Act, authority to enter into contracts, to incur obligations, or to make payments under this Act shall be effective only to the extent, and in such amounts as are provided in advance in appropriation Acts.

Approved December 23, 1980.

Fire Island National Seashore Wilderness Stewardship Plan –

Appendix C. Map of the Otis Pike Fire Island High Dune W

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APPENDIX D: Monitoring Trends in Wilderness Character of the Fire Island Wilderness

An interagency Wilderness Character Monitoring Team representing the Bureau of Land Management, Fish and Wildlife Service, National Park Service, U.S. Forest Service, and U.S. Geological Survey created an interagency strategy to monitor trends in wilderness character across the National Wilderness Preservation System called *Keeping It Wild* (Landres et al. 2008). This framework defines the four qualities of wilderness character using language directly from the Wilderness Act and identifies specific quantifiable indicators and measures that can be used to assess trends.

Quality	Monitoring Question	Indicator
Untrammeled— Wilderness is essentially unhindered and free from modern human control or manipulation	What are the trends in actions that control or manipulate the "earth and its community of life" inside wilderness?	Actions authorized by the Federal land manager that manipulate the biophysical environment
		Actions not authorized by the Federal land manager that manipulate the biophysical environment
Natural— Wilderness ecological systems are substantially free from the effects of modern civilization	What are the trends in terrestrial, aquatic, and atmospheric natural resources inside wilderness?	Plant and animal species and communities
		Physical resources
	What are the trends in terrestrial, aquatic, and atmospheric natural processes inside wilderness?	Biophysical resources
Undeveloped— Wilderness retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation	What are the trends in non-recreational development inside wilderness?	Non-recreational structures, installations, and developments
		Inholdings
	What are the trends in mechanization inside wilderness?	Use of motor vehicles, motorized equipment, or mechanical transport
	What are the trends in cultural resources inside wilderness?	Loss of statutorily protected cultural resources
Solitude or Primitive and Unconfined Recreation— Wilderness provides outstanding opportunities for solitude or primitiveand unconfined recreation	What are the trends in outstanding opportunities for solitude inside wilderness?	Remoteness from sights and sounds of people inside the wilderness
		Remoteness from occupied and modified areas outside wilderness
	What are the trends in outstanding opportunities for primitive and unconfined recreation inside wilderness?	Facilities that decrease self-reliant recreation
		Management restrictions on visitor behavior

Table 1: Interagency monitoring framework as shown in Keeping it Wild, Landres et al. 2007

Fire Island National Seashore Wilderness Stewardship Plan –Draft July 2014

Indicators and Measures

For each quality of wilderness character there are monitoring questions, indicators, and measures. Each indicator is listed below, followed by a description of the indicator, the measures selected, and protocols describing how the data will be collected. The data collected the first year will serve as a baseline assessment, and in subsequent years, trends over time can be evaluated. The trend in each measure will be assigned a numerical score of -1, 0, or 1 as compared to the prior year, indicating "degrading," "stable," or "improving" wilderness character, respectively. The chart following the descriptions indicates whether that measure increases (↑) or decreases (↓) wilderness character (WC). All measures are weighed equally, allowing for an assessment of change in wilderness character but not assessing the magnitude of change. The measures and protocols are subject to change as staff obtain new information or data, or identify measures or protocols that more accurately reflect change in wilderness character.

Quality	*Indicator*	Measures	Ranking
Untrammeled- Wilderness is essentially unhindered and free from modern human control or manipulation	1. *Actions authorized by the NPS-FIIS that manipulate the biophysical environment*	a) Number of actions to manage plants, animals, pathogens, soil, water, or fire b) Number of natural fire starts that receive a suppression response	a) ↑ in # of actions= ↓ in WC b) ↑ in # of actions= ↓ in WC
	2. *Actions NOT authorized by the NPS-FIIS that manipulate the biophysical environment*	a) Number of unauthorized actions by other Federal or State agencies, citizen groups, or individuals that manipulate plants, animals, pathogens, soil, water, or fire	a) ↑ in # of actions= ↓ in WC
Natural- Wilderness ecological systems are substantially free from the effect of modern civilization	1. *Plant and animal species and communities*	a) Number of indigenous species that are listed as threatened and endangered, sensitive, or of concern b) Abundance of indigenous species that are listed as threatened and endangered, sensitive, or of concern c) Number of invasive non-indigenous species d) Acreage of invasive non-indigenous species	a) ↑ in # = ↑ in WC b) ↑ in abundance = ↑ in WC c) ↑ in # = ↓ in WC d) ↑ in acreage = ↓ in WC
	2. *Physical resources*	a) Ozone air pollution based on concentrations of N100 episodic and W126 chronic ozone exposure affecting sensitive plants b) Extent and magnitude of change in water quality	a) ↑ in ozone = ↓ in WC b) ↑ in WQ measurements = ↓ in WC
	3. *Biophysical resources*	a) Forest Health b) Salt Marsh Surface Elevation Tables (SETs)	a) ↑ in acreage = ↓ in WC b) ↑ in elevation = ↓ in WC

Quality	*Indicator*	Measures	Ranking
Undeveloped- Wilderness is essentially without permanent improvements or modern human occupation	*1. Non-recreational structures, installations, and developments*	a) Number of authorized physical developments b) Number of unauthorized (user-created) physical developments	a) ↑ in # = ↓ in WC b) ↑ in # = ↓ in WC
	2. Use of motor vehicles, motorized equipment, or mechanical transport	a) Number of administrative and non-emergency uses of motor vehicles, motorized equipment, or mechanical transport b) Number of emergency uses of motor vehicles, motorized equipment, or mechanical transport c) Number of motor vehicle, motorized equipment, or mechanical transport uses NOT authorized by NPS-FIIS	a) ↑ in # = ↓ in WC b) ↑ in # = ↓ in WC c) ↑ in # = ↓ in WC
	3. Removal of remnants that remain in the wilderness from past occupation	a) Number of actions to remove remnants	a) ↑ in # = ↑ in WC
Solitude or Primitive and Unconfined Recreation- Wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge	*1. Remoteness from sights and sounds of people inside wilderness*	a) Amount of visitor use b) Number of areas negatively affected by camping c) Number of actions taken that affect travel routes inside the wilderness	a) ↑ in visitor use = ↓ in WC b) ↑ in # of actions = ↓ in WC c) ↑ in # of actions = ↓ in WC
	2. Remoteness from occupied and modified areas outside the wilderness	a) Area of Wilderness affected by access or travel routes that are adjacent to the Wilderness b) Night sky visibility averaged over the Wilderness	a) ↑ of people = ↓ in WC b) ↑ in light pollution = ↓in WC
	3. Facilities that decrease self-reliant recreation	a) Number of agency-provided recreation facilities	a) ↑ in # = ↓ in WC
	4. User trail development	a) Number of actions taken to mitigate user trails	a) ↑ in # of actions = ↓ in WC
	5. Management restrictions on visitor behavior	a) Number of visitor-use restrictions	a) ↑ in # of restrictions = ↓ in WC

Table 2: Wilderness Character Monitoring Framework for the Otis Pike Fire Island High Dune Wilderness

Untrammeled Quality

1. Actions authorized by the Federal land manager that manipulate the biophysical environment
    a. Number of actions to manage plants, animals, pathogens, soil, water, or fire
        i. Description: All actions to manage plants, animals, pathogens, soil, water, or fire within the Wilderness will be documented.
        Examples of actions
            1. Every action to eradicate non-native invasive plant species within a defined area (i.e., a polygon of an infested area that was mapped using GPS/GIS) during a given period of time will be documented.
            Measure: See Appendix A

2. Any action to maintain or rebuild deer exclosures within the boundaries of the Wilderness will be identified.
   Measure: Number of actions to maintain or rebuild deer exclosures within the boundaries of the Wilderness will be tallied annually.
3. To exclose predators from nest(s) (e.g., Piping Plover nests). To exclose predators from Piping Plover nests for one year would be considered one action.
4. Number of actions to symbolically fence threatened and endangered species habitat (see 3 above).

Future Management

As management strategies change, new descriptions of the actions and how to measure them will be identified.

b. Number of natural fire starts that receive a suppression response
   i. Description: All natural fire starts and suppression activity within the Wilderness area will be documented on the NPS Wildland Fire Report Form.
   ii. Measure: Annual compilation of natural fires that receive suppression will be reported.

2. Actions NOT authorized by the Federal land manager that manipulate the biophysical environment
   a. Number of unauthorized actions by other Federal or State agencies, citizen groups, or individuals that manipulate plants, animals, pathogens, soil, water, or fire
      i. Description: All unauthorized actions that manipulate plants, animals, pathogens, soil, water, or fire will be investigated by the Resource and Visitor Protection staff with necessary technical assistance by Resource Management staff. All incidents will be documented on Form 10-343 Case Incident Report.
      ii. Measure: Case Incident Reports will be compiled annually.

Natural Quality

1. Plant and animal species and communities
   a. Abundance, distribution, or number of indigenous species that are listed as threatened and endangered, sensitive, or of concern
      i. Description: All species (federal or state listed and/or species of concern to the park) that exist within the boundaries of the Wilderness will be identified. Due to the dynamic nature of the system and thus the boundary, this analysis will include species that may live within or directly adjacent to the Wilderness.
      ii. Measure:
         1. The total number of these species found within the Wilderness
         2. The abundance of these identified species

b. Abundance, distribution, or number of invasive non-indigenous species
    i. Description: Total area of invasive plants in the Wilderness.
    ii. Measure: All species that exist within the boundaries of the Wilderness will be identified. The total acreage of invasive plants within the Wilderness will be calculated. This will be monitored annually, because the total acreage will fluctuate due to the either an increase of invasive plants or eradication efforts.

2. Physical resources
    a. Ozone air pollution based on concentration of N100 episodic and W126 chronic ozone exposure affecting sensitive plants
        i. Description: The park can utilize air quality monitors within 10 miles of the park for ozone. The NPS Air Resources Division has already been using off-site air quality monitors to assess trends in ozone (NPS 2008); the park will contact the division to find out which off-site air quality monitor they've been using and utilize the same resource for this protocol.
        ii. Measure:
            1. Average concentration of N100 episodic ozone
            2. Average concentration of W126 chronic ozone
    b. Extent and magnitude of change in water quality
        i. Description: The park can utilize groundwater quality research already occurring within the Wilderness and adjacent areas (USGS and the NPS Northeast Coastal Barrier Island Network). This data would be most suitable to use, since these areas are permanently marked and part of a long-term monitoring program. Monitoring now occurs every other year.
        ii. Measure: Need to consult with USGS and NPS (Northeast Coastal Barrier Island Network) on the best indicators. TBD.

3. Biophysical resources
    a. Forest Health
        i. Description: The Durham Field Office of Forest Health Protection conducts insect and disease aerial detection surveys annually using a fixed-wing aircraft. FIIS works in cooperation with the U.S. Forest Service to complete this survey.
        ii. Measure: The map created from this survey will be used to document the current year's forest injury within the Wilderness.
    b. Salt Marsh Elevation
        i. Description: Researchers from the NPS Northeast Coastal Barrier Island monitor salt marsh elevation tables (SET) at several permanently marked areas within the Wilderness salt marshes.

ii. Measure: The surface elevations of the salt marshes will be averaged. This is typically measured as a rate: mm per year ± SE.

Undeveloped Quality

1. Non-recreational structures, installations, and developments
    a. Number of authorized physical developments
        i. Description: An inventory of all authorized physical developments will be created and maintained. Further developments will be within the framework of the Minimum Requirements Decision Guide.
        ii. Measure: All new or agency-proposed development will be compiled annually.
    b. Number of unauthorized (user-created) physical developments
        i. Description: An inventory of all unauthorized physical developments will be created and maintained.
        ii. Measure: Annual physical inspections of the Wilderness will be performed; new developments will be noted and brought to attention for possible reclamation.

2. Use of motor vehicles, motorized equipment, or mechanical transport
    a. Number of administrative and non-emergency use of motor vehicles, motorized equipment, or mechanical transport
        i. Description: All agency use of motorized or mechanical transport will be within the framework of the Minimum Requirements Decision Guide. Minimum activity decisions will be documented and filed.
        ii. Measure: Administrative and agency use will be compiled annually.
    b. Number of emergency uses of motor vehicles, motorized equipment, or mechanical transport
        i. Description: All emergency uses of motorized or mechanical transport for emergencies involving the health and safety of persons by any Emergency Medical Service provider or First Responder will be documented on Form 10-343 Case Incident Report
        ii. Measure: Case Incident Reports will be compiled annually.
    c. Number of motor vehicle, motorized equipment, or mechanical transport uses NOT authorized by the Federal land manager
        i. Description: All unauthorized use of motorized or mechanical transport will be investigated by Visitor and Resource Protection and documented on Form 10-343 Case Incident Report.
        ii. Measure: Case Incident Reports will be compiled annually.

3. Removal of remnants that remain in the Wilderness from past human occupation
    a. Number of actions to remove past remnants of human occupation
        i. Description: No cultural resources within the Fire Island Wilderness have been identified. All past remnants of human occupation are not protected in any way and ultimately detract from wilderness character; their removal would increase wilderness character.
        ii. Measure: All actions to remove past remnants of human occupation will be pursued according to the Minimum Required Decision Guide and will be compiled annually.

Solitude or Primitive and Unconfined Recreation Quality

1. Remoteness from sights and sounds of people inside Wilderness
    a. Amount of visitor use
        i. Description: Backcountry camping is managed by the Parks Backcountry Camping Policy. It serves as the guide for the number of campers and visitor restrictions within Fire Island Wilderness. Backcountry camping permits will be issued to individuals who camp in the Wilderness.
        ii. Measure: The total number of people will be multiplied by the number of nights camping to get a total number of stays. The number of overnight stays will be annually compiled and assessed.

    b. Number of areas negatively affected by camping
        i. Description: The Fire Island Wilderness has no designated campsites. Backcountry camping in the area follows the principle of "leave no trace." The area will be monitored continuously by Visitor and Resource Protection, and action will be taken immediately to rehabilitate any area that has been impacted due to camping. The Wilderness will be considered holistically during the annual condition assessment for camping.
        ii. Measure: Any action taken to mitigate or rehabilitate an impact due to camping will be documented on Form 10-343 (Case Incident Report) and compiled annually.
    c. Area affected by access or travel routes inside the Wilderness
        i. Description: Fire Island National Seashore maintains the boardwalks at Old Inlet and Smith Point along with the footpath called Burma Trail. These are the designated travel routes within the Wilderness, but visitors are not limited to them.
            1. All existing boardwalks with the Wilderness will be monitored annually for changes, which could include their removal or destruction due to weather, erosion, or general wear and tear.

2. Any decision to reconstruct or create addition boardwalk within the Wilderness will be within the framework of Minimum Requirements Decision Guide. Minimum activity decisions will be documented and filed.
3. Burma Trail is a very dynamic trail and shifts with the moving sand. Efforts made to maintain a clear trail will be made within the framework of the Minimum Requirements Decision Guide. Minimum activity decisions will be documented and filed.

ii. Measure: The total number of actions taken will be compiled annually.

2. Remoteness from occupied and modified areas outside the Wilderness
   a. Area of wilderness affected by access or travel routes that are adjacent to the Fire Island Wilderness
      i. The Fire Island Wilderness is affected by a several access or travel routes that are adjacent to the Wilderness.
         1. Watch Hill
            a. Description: Watch Hill is on the westernmost border of the Wilderness. It houses employees and a 200-boat marina that is utilized by visitors. Within the marina there are many different facilities such as a visitor center, tiki bar, restaurant, snack bar, and general store. Watch Hill also contains a campground with 25 sites and one group site. Access to the area is provided by seasonal ferry and private boat only.
            b. Measure: Total visitation as calculated from the Monthly Public Use Report for Watch Hill.

         2. Bellport Beach
            a. Description: Owned by the Village of Bellport and also referred to as Ho-Hum Beach, the area is approximately 17 acres. It has seasonal access by the private ferry for Village residents and contains a small marina, concession stand, showers, gazebo, and a seasonally lifeguarded beach.
            b. Measure: Visitation totals will be acquired from the Village of Bellport.

         3. Great South Bay
            a. Description: The Great South Bay is a navigable waterway with channels maintained by the United States Coast Guard. The main east-west channel adjacent to the Wilderness is outside of the Park's boundary, but two north-south channels exist within the boundary that are privately maintained. The Village of Bellport

maintains a channel that accesses land outside the Wilderness area.

b. Measure: The total number of boats that are moored offshore or beached within the Old Inlet area will be compiled..

4. Smith Point and Wilderness Visitor Center

a. Description: Smith Point lies on the easternmost border of the Wilderness. The Wilderness Visitor Center is located just outside the boundary and is accessible year round by vehicle via a bridge. Smith Point allows for visitor day use on the Great South Beach along with recreational beach driving in season.

b. Measure: The total number of uses will be calculated from the East District Monthly Public Use Report, including the number of visitors to the visitor center and the beach and recreational vehicles.

5. Great South Beach Off-Road Driving

a. Description: The Wilderness Visitor Center at Smith Point tracks the number of trips ORVs take on the ocean beach adjacent to the Wilderness. Vehicles operating on the beach must obtain a federal permit for recreation, contractor, essential service, public utility, or resident access. A 20-foot buffer exists between the southern boundary of the Wilderness and route for off-road driving.

b. Measure: The total number of non-recreation visits as per the Monthly Public Use Report.

b. Night sky visibility averaged over the Wilderness

i. Description: A general baseline analysis of the brightness of the night sky was conducted in FY11. Park staff will continue to use Sky Quality Meters to measure the overall brightness of the night sky. Staff will consult with scientists working with the NPS Night Sky Program to ensure quality data collection and analysis. Measures of the brightness of the night sky will be collected annually and compared to previous years. In conjunction, Management will create an outdoor lighting plan that will assess current artificial lighting in/around the Wilderness and work to promote natural darkness for dependent fauna and visitor enjoyment.

ii. Measure:

1. Average brightness of the night sky
2. The number of actions to improve the natural dark sky

3. Facilities that decrease self-reliant recreation
    a. Number of agency-provided recreation facilities
        i. Description: An inventory of all authorized agency-provided recreational facilities will be created and maintained. Other facilities will be developed within the framework of Minimum Requirement Decision Guide.
        ii. Measure: Annual physical inspection of the Wilderness will be performed. All new and existing agency developments will be compiled.
    b. Number of user-created recreation facilities
        i. Description: Facilities built or installed by users for recreational purposes include but not limited to shelters, trails, trail markings, bridges, and hunting blinds. An inventory of user-created recreation facilities will be created and maintained.
        ii. Measure: Annual physical inspection of the Wilderness will be performed, and all new user-created facilities documented on Form 10-343 Case Incident Report and compiled annually.

4. User Trail Development
    a. Number of actions taken to mitigate user trails
        i. Description: User trails are defined as any path or route of travel that is not officially created and maintained by the Fire Island National Seashore. Annual physical inspection of the Wilderness will be performed, and user trails will be inventoried and assessed for condition.
        ii. Measure: Any action taken to mitigate impact reported on Form 10-343 Incident Case Report and compiled annually.

5. Management restrictions on visitor behavior
    a. Number of additional visitor-use restrictions
        i. Description: Current visitor use restrictions
            1. Group size for Backcountry Camping: 8 people per permit
            2. Number total people backcountry camping; west zone 24 persons, east zone 12 persons
            3. Threatened & Endangered species closures; 36 CFR 1.5
            4. No livestock
            5. No fires or grills; camp stoves only.
        ii. Measure: Additional visitor-use restrictions created will be compiled.

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TREND ANALYSIS

Trend in Measure

The first year's monitoring will provide a baseline for the wilderness character of the Fire Island Wilderness and will not imply if conditions are "good," "bad," or "desired." The baseline is simply the reference point from which change will be measured over time. Data collected from the protocols are inputted to the Wilderness Character Trend Worksheet and compared to the previous year. Using the framework ranking system, the measures will be compared to determine whether there is an increase (↑) or decrease (↓) in Wilderness character (WC). When the ranking indicates an increase in WC, the trend measure added to the worksheet is +1; a decrease is -1; and no change is a zero (0).

Quality¤	*Indicator¤*	Measures¤	Ranking¤
Untrammeled--¶ ¶ Wilderness·is·essentially·unhindered·and·free·from·modern·human·control·or·manipulation¤	1.→ *Actions·authorized·by·the·NPS-FIIS·that·manipulate·the·biophysical·environment¤*	a)→ Number·of·actions·to·manage·plants,·animals,·pathogens,·soil,·water,·or·fire¶ b)→ Number·of·natural·fire·starts·that·receive·a·suppression·response¤	a)→ ↑·in·#·of·actions=·↓·in·WC¶ b)→ ↑·in·#·of·actions=·↓·in·WC¶ ¤
	2.→ *Actions·NOT·authorized·by·the·NPS-FIIS·that·manipulate·the·biophysical·environment¤*	a)→ Number·of·unauthorized·actions·by·other·Federal·or·State·agencies,·citizen·groups,·or·individuals·that·manipulate·plants,·animals,·pathogens,·soil,·water,·or·fire¤	a)→ ↑·in·#·of·actions=·↓·in·WC¶ ¤

Measure	Previous Year	Current Year	Trend in Measure	Trend in Indicator	Trend in Question	Trend in Quality
Untrammeled Quality						
1a. Management Actions	3	5	-1	-1	0	0
1b. Fire Suppression	0	1	-1			
2a. Unauthorized Actions	3	1	1	1		

Table 3: An example of inputting measures to the worksheet for Untrammeled Quality using the ranking from the framework

Trends in Indicator, Question, and Quality

If the indicator has only one trend, then the indicator is same as the measure. If the indicator has more than one trend, trends from each measure are summed to find a numerical value. If the value is a positive number, then the indicator is a +1. When the sum is a negative number, the indicator is a -1, and if the sum is zero the indicator is a zero, signifying an offsetting stable. Trends in question and quality are calculated using the same procedure.

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Trend Assessment

Along with the Fire Island Wilderness Character Worksheet, a narrative will provide information about the wilderness conditions, circumstances, and context that affect the interpretation and use of the trends and results of the wilderness character-monitoring protocols. The narrative will add qualitative information to complement the data.

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Legend

Treatments by species

Pinus thunbergii
Black Pine

Elaeagnus umbellate
Autumn Olive

Centaurea maculosa
Spotted Knapweed

Each treatment type listed below counts as one action.

-Treatment A- Hack n squirt (1 day in April 2009)

-Treatment B-Crew of 6 cutting down Black Pine (2 days in March 2010)

-Treatment C- SCA interns pulling Autumn Olive (2 days in May 2008)

-Treatment D-EPMT Basal Bark Treatment (2 days in August 2008)

-Treatment E- SCA interns pulling Spotted Knapweed (1 day in June 2009)

-Treatment F- SCA interns retreating same Spotted Knapweed (1 day in June 2010)

Protocol 1: Criteria for documenting actions related to invasive species removal

The protocols state that every action to eradicate non-native invasive plant species within a defined area during a given period of time will be documented.

However, properly identifying a single action from the definition above can be difficult. Each action will be defined by the land manager who is implementing the effort. To help with identifying individual actions, we have defined all the eradication efforts within the Wilderness 2008-2010. The examples on the maps above illustrate the proper and consistent method of identifying an action.

Explanation of each method:
Each treatment below has been defined as one action.
Treatment A was a "hack and squirt" treatment carried out in the Wilderness on one day in April of 2009 to test the effectiveness of this herbicide-based method. This will be considered one action even though treatments were carried out in two different areas

Treatment B was carried out with a crew of six during March of 2010. This was a two-day effort testing the effectiveness of directly removing black pine trees by cutting them down. This will be considered one action even though it took two days to achieve.

Treatment C was performed by a crew of SCA interns, who spent two days pulling Autumn Olive in May 2008. This will also be considered one action even though it took two days.

Treatment D was completed by the Northeast Exotic Plant Management Tem (EPMT), who treated black pine trees using a basal bark method. This effort took two days and was implemented in numerous areas of the Wilderness. This also will be considered one action even though it took two days and was carried out in multiple areas.

Treatment E was performed by a crew of SCA interns, who spent one day pulling Spotted Knapweed in June 2009.

Treatment F was a retreatment of the same Spotted Knapweed by a crew of SCA interns on one day in June 2010. Treatments E and F were considered two actions, because they were two different efforts in two different field seasons.

Protocol 2: Measuring indigenous species that are listed as threatened, endangered, sensitive, or of concern

Scientific name	Common name	Park Status	Currently monitored? (Y/N)	Management Priority Details
Amaranthus pumilus	Seabeach amaranth	Present in park	Y	Global rank: G2 Federal: threatened NY State: endangered
Polygonum glaucum	Seaside knotweed	Present in park	Y	NY State: rare
Kinosternon subrubrum	Eastern mud turtle	Present in park	N	Global rank: G5 NY State: endangered
Charadrius melodus	Piping plover	Present in park	Y	Federal: threatened NY State: endangered
Sternula antillarum	Least tern	Present in park	Y	Federal: endangered (only interior U.S populations) NY State: threatened
Sterna dougallii	Roseate tern	Present in park	Y	Federal: endangered NY State: endangered

Table 4: Indigenous Species Listed as Threatened, Endangered, Sensitive, or of Concern

Six species listed as threatened, endangered, sensitive, or of concern indigenous to the Fire Island Wilderness are listed in Table 4. Five of these species have been confirmed and are annually monitored by NPS staff: seabeach amaranth, seaside knotweed, piping plover, least tern, and roseate tern.

Two things will be ranked relative to the previous year:

1) The total number of these known species found within the Fire Island Wilderness; and

2) The abundance of each of these species.

Seabeach amaranth & **Seaside knotweed** surveys are conducted in mid-August by FIIS staff; data is submitted to The Nature Conservancy's Long Island Field Office and included in the Seashore's end-of-year Threatened & Endangered Species Report.

- Abundance will be measured as the number of plants.
- Ranking (relative to previous year)
  - Significantly fewer plants = -1
  - Approximately the same number of plants = 0
  - Significantly more plants = +1

Piping plover surveys are conducted throughout the breeding/nesting season (April through August); data is submitted to the New York State Department of Environmental Conservation and included in the park's end-of-year Threatened & Endangered Species Report.

- Abundance will be measured as the number of nesting pairs

- Ranking (relative to previous year)
  - Fewer nesting pairs = -1
  - Same number of nesting pairs = 0
  - More nesting pairs = +1

Least tern & **Roseate tern** surveys are conducted throughout the breeding/nesting season (June through August); data is submitted to the New York State Department of Environmental Conservation and included in the park's end-of-year Threatened & Endangered Species Report.

- Abundance will be measured as the number of nesting/breeding adults
  - Significantly fewer adults = -1
  - Approximately the same number of adults = 0
  - Significantly more adults = 1

Protocol 3: Standard Operating Procedure for Measuring Night Sky

The goal of the initial night sky assessment is to acquire a representative baseline data set for the Fire Island Wilderness on Fire Island National Seashore (FIIS). Night sky quality is inventoried to determine which sites within the Wilderness have natural or pristine night sky. Standardized procedures and data elements for describing, classifying, and comparing light pollution in the park's night sky are as follows.

Using the Sky Quality Meter (SQM), collect five to ten data sets throughout the year, with as many data sets as possible collected in a period with the clearest night sky. Collecting data when this opportunity arises is important, because many natural factors can interfere with data acquisition at any time during the year (e.g., weather conditions, smoke, dust, humidity, and air glow).

For the most accurate results, it is best to take many readings using the SQM and disregard the very first reading. Because the readings are somewhat temperature dependent, the meter should be left outside for at least 5 minutes to reach ambient temperature before taking any measurements. Avoid use near lights like streetlights and in areas that are shaded by trees or structures. A rule of thumb for the SQM is to be as far from an object as it is high. Use the SQM to take readings when/where the following conditions are met:

- Moonless night
- No clouds or fog
- Sun at least 18 degrees below the horizon (astronomical twilight). It is best to wait until after astronomical twilight for total natural darkness before taking SQM measurements. To learn the time for astronomical twilight at a particular location as well as Moon phase and Moon rise and set times, see http://www.sunrisesunset.com/custom_srss_calendar.asp.
- No direct light from artificial sources reaches the detector of the device.

There are six sampling points along a transect (Burma Road) in the Fire Island Wilderness. The only reference to suggested distance between sampling points found was "a few kilometers,"

as luminance changes over such a distance. Sampling points were therefore separated by two kilometers to both roughly incorporate this parameter and increase the number of points within the Fire Island Wilderness (see map). Five sky brightness readings should be recorded at each point.

The SQM readings can then be used to create a map of overall night sky quality. First, the three readings at each sampling point must be averaged. This number can then be converted to estimate night sky quality using the Bortle Scale as consistent with other national parks (http://en.wikipedia.org/wiki/Bortle_Dark-Sky_Scale). Once converted, device readings can be overlain in ArcMap with aerial photographs of the Wilderness in order to visualize the correspondence between ground locations and each set of sky brightness measurements.

The Seashore should continue to monitor the condition and trend of night sky light pollution within and adjacent to the Fire Island Wilderness. Data sets should be collected as often as possible, at least every five years or when nearby development or light pollution changes occur. Artificial light sources in areas such as Watch Hill, Bellport Beach, Old Inlet, and Smith Point should be modified where possible to minimize light pollution. Approved lighting and other devices are listed on the International Dark Sky Association website (i.e., Visionaire Lighting's Sahara Type 5, Size 3 is listed for lighting pedestrian and parking areas).

Point Number GPS coordinates (UTMs, Zone 18T)		
	X (easting)	**Y (northing)**
1	670327	4506485
2	672071	4507455
3	673813	4508444
4	675645	4509250
5	678108	4510358
6	679289	4510900

Table 5: Night Sky Monitoring – randomly selected points (from west to east) in Fire Island Wilderness

Adapted from:

Birriel, Jennifer et al. (2010) Documenting Local Night Sky Brightness Using Sky Quality Meters: An Interdisciplinary College Capstone Project and a First Step Toward Reducing Light Pollution. Retrieved from: 65.118.148.196/sites/default/files/webpublications/ejaavso/v38n1/132.pdf

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Dark Skies Awareness: Sky Quality Meter monitoring
www.darkskiesawareness.org/sqm-zlpa.ph

Globe at Night
http://www.noao.edu/outreach/press/pr08/files/GaN_SQM.pdf

International Dark Sky Association
http://www.darksky.org/mc/page.do;jsessionid=8CE4B26B82B00C243FB6CE6FB085F23C.mc1?sitePageId=119791

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Measure	Previous Year	Current Year	Trend in Measure	Trend in Indicator	Trend in Question	Trend in Quality	Trend in WC
Untrammeled Quality							
1a. Management Actions							
1b. Fire Suppression							
2a. Unauthorized Actions							
Natural Quality							
1a. Number Listed Species							
1b. Abundance Listed Species							
1c. Number Invasive Species							
1d. Acreage Invasive Species							
2a. Ozone							
2b. Water Quality							
3a. Forest Health							
3b. Salt Marsh Elevation							
Undeveloped Quality							
1a. Authorized Development							
1b. Unauthorized Development							
2a. Authorized Use							
2b. Emergency Use							
2c. Unauthorized Use							
3a. Removal of Occupation							
Solitude Quality							
1a. Visitor Use							
1b. Negative Effects Camping							
1c. Travel Routes Actions							
2a. Travel Adjacent							
2b. Night Sky Visibility							
3a. Recreation Facilities							
4a. User Trails							
5a. Visitor-Use Restrictions							

Table 6: Wilderness Character Trend Worksheet

APPENDIX E: Resources and Websites Consulted

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Acronyms and Abbreviations

API – Asset Priority Index

ASMIS – Archeological Sites Management Information System

BOCES – Board of Cooperative Educational Services

CDP – Fire Island Census Designated Place

CEHA – Coastal Erosion Hazard Act

CEQ – Council on Environmental Quality

CESU – Cooperative Ecosystems Studies Unit

CFR – Code of Federal Regulation

CLI – Cultural Landscape Inventory

CLR – Cultural Landscape Report

CMP – Comprehensive Management Plan

CWA – Clean Water Act

CZMA – Coastal Zone Management Act

CZMP – Coastal Zone Management Plan

DO – Director's Order

DOI – Department of the Interior

EEE – Eastern Equine Encephalitis

EIS – Environmental Impact Statement

EMS – Emergency Medical Services

EO&A – Ethnographic Overview and Assessment

FEMA – Federal Emergency Management Agency

FIA – Fire Island Association

FCI – Facility Condition Index

FILPS – Fire Island Lighthouse Preservation Society

FILSEC – Fire Island Law Enforcement, Safety & Emergency Council

FINS – Fire Island National Seashore

FIMP – Fire Island Inlet to Montauk Point Reformulation Study

FMP – Fire Management Plan

FTE – Full-Time Equivalencies

FWS (also USFWS) – United States Fish and Wildlife Service

FY – Fiscal Year

GMP/EIS – General Management Plan/Environmental Impact Statement

HABS – Historic American Building Survey

HAER – Historic American Engineering Record

HALS – Historic American Landscape Survey

HFR – Historic Furnishings Report

HRS – Historic Resource Study

HSR – Historic Structure Report

IPCC – Intergovernmental Panel on Climate Change

LCS – List of Classified Structures

LEED – Leadership in Energy & Environmental Design

LIPA – Long Island Power Authority

LIRR – Long Island Railroad

MAP – Mosquito Action Plan

MPA – Marine Protected Area

MPO – Metropolitan Planning Organization

MTA – Metropolitan Transit Authority

NEPA – National Environmental Protection Act of 1969, as amended

NPCA – National Parks and Conservation Association

NPS – National Park Service

NGVD – National Geodetic Vertical Datum

NOAA – National Oceanic and Atmospheric Administration

NRCS – Natural Resources Conservation Service

NRHP – National Register of Historic Places

NWPS – National Wilderness Preservation System

NYMTC – New York Metropolitan Transportation Council

NYS – New York State

NYS CZM – New York Office of Coastal Zone Management

NYS DEC – New York Department of Environmental Conservation

NYS DOS – New York Department of State

NYS DOT – New York Department of Transportation

NYSTIP – New York State Transportation Improvement Program

ORV – Off Road Vehicle

PMF – Patchogue Maintenance Facility

RM – Reference Manual

RTP – Regional Transportation Plan

SAV – Submerged Aquatic Vegetation

SCDHS – Suffolk County Department of Health Services

SCDPW – Suffolk County Department of Public Works

SCPD – Suffolk County Police Department

SCT – Suffolk County Transit

SCVC – Suffolk County Vector Control

SCWA – Suffolk County Water Authority

SEQRA – State Environmental Quality Review Act

SHPO – State Historic Preservation Officer

SPLIA – Society for the Preservation of Long Island Antiquities

SSER – South Shore Estuary Reserve (Long Island)

T&E – Threatened and Endangered

TFSP – Tentative Federally Supported Plan (in re: FIMP)

TNC – The Nature Conservancy

USACE – United States Army Corps of Engineers

USDA – United States Department of Agriculture

USFWS (also FWS) – United States Fish and Wildlife Service

USGS – United States Geological Survey

VEE – Visitor Experience and Enjoyment functional area

WNV – West Nile Virus

WSP – Wilderness Stewardship Plan

Glossary

Accessibility. The provision of park programs, facilities, and services in ways that include individuals with disabilities, or makes available to those individuals the same benefits available to persons without disabilities. See also, universal design. Accessibility also includes affordability and convenience for diverse populations.

Accretion. The gradual and imperceptible accumulation of alluvion (soil) by natural causes. It is created by operation of natural causes.

Adaptive Management. A process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. It also recognizes the importance of national variability in contributing to ecological resilience and productivity.

Adaptive reuse. The process of adapting an historic structure for a new purpose, while retaining the character-defining features that contribute to the historic significance of the structure.

Aids to navigation. Any device external to a vessel or aircraft intended to assist a navigator to determine position or safe course, or to warn of dangers or obstructions to navigation.

Aquifer. A body of permeable rock or sediment capable of storing or transmitting water.

Archeological resource. 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. An archeological resource can yield scientific or humanistic information through research.

Archeological site. Any place where there is physical evidence of past human occupation or activity. Physical evidence may consist of artifacts, agricultural terraces and hearths, structures, trash deposits, or alterations of the natural environment by human activity.

Backcountry. Primitive, undeveloped portions of parks.

Barrier island. A long broad sandy island lying parallel to a shore that is built up by the action of the waves, currents, and wind and that protects the shore from the effects of the ocean.

Benthic resources. Benthic resources include all things found within the benthic zone, which is defined as the bottom of a body of water. The organisms that inhabit the benthic zone are called Benthos. They include sessile forms (e.g., oysters,), creeping organisms (e.g., crabs), burrowing animals (e.g., many clams and worms), fish, plants and seagrasses such as eel grass.

Best management practices. Practices that apply the most current means and technologies available to not only comply with mandatory environmental regulations, but also maintain a superior level of environmental performance.

Brackish. A mix of saltwater and freshwater.

Carrying capacity (visitor). The type and level of visitor use that can be accommodated while sustaining the desired resource and visitor experience conditions in a park.

Census Designated Place. A statistical entity, defined for each decennial census according to Census Bureau guidelines, comprising a densely settled concentration of population that is not within an incorporated place, but is locally identified by a name. CDPs are delineated cooperatively by State and local officials and the Census Bureau, following Census Bureau guidelines.

Citizen Science. Citizen Science programs involve middle school, high school and college students as well as members of the general public in activities including biological inventory, long-term monitoring, and investigative research. Citizen Science programs present the opportunity to educate the public about the environment, teach people about the process of science, and connect people to the natural world through stewardship.

Coastal morphology. The study of the origin and evolution of coastal features.

Consultation. A discussion, conference, or forum in which advice or information is sought or given, or information or ideas are exchanged. Consultation generally takes place on an informal basis. Formal consultation is conducted for compliance with Section 106 of the National Historic Preservation Act, the National Environmental Policy Act, and with Native Americans.

Critical habitat. Specific areas within a geographical area occupied by a threatened or endangered species that contain physical or biological features essential to the conservation of the species, and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species at the time of its listing, upon a determination by the Secretary of the Interior that such areas are essential for the conservation of the species.

Cultural landscape. 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. There are four non–mutually-exclusive types of cultural landscapes: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

Cultural resource. An aspect of a cultural system that is valued by or significantly representative of a culture, or that contains significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. For the National Register of Historic Places, tangible cultural resources are categorized as districts, sites, buildings, structures, and objects; for National Park Service management purposes, they may include archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources.

Cyclic maintenance. Cyclic Maintenance constitutes a central element of life-cycle management by incorporating regularly scheduled preventive maintenance procedures and preservation techniques into a comprehensive program of recurring maintenance and component renewal to ensure a particular resource, utility, or facility meets or exceeds its intended life cycle. Cyclic maintenance is a key component in preventing deferred maintenance (DM) and controlling the costs of maintenance and repairs.

Deferred maintenance. Maintenance that was not performed when it should have been, and therefore, is delayed. Continued deferment of maintenance results in deficiencies. Deferred maintenance is the cost to repair an asset's deficiencies.

Ecosystem. A system formed by the interaction of a community of organisms with their physical environment, considered as a unit.

Ecosystem management. Management related to the interdependence of natural and cultural systems that integrates scientific knowledge of ecological relationships with resource stewardship practices.

Enabling legislation. Laws authorizing units of the national park system.

Endangered. A species in danger of extinction through all or a significant portion of its range.

Erosion. The gradual and imperceptible washing away of the land by natural causes.

Ethnographic resources. Objects and places, including sites, structures, landscapes, and natural resources, with traditional cultural meaning and value to associated peoples, assessed through research and consultation with such people. Ethnographic resources eligible for the National Register of Historic Places are called traditional cultural properties.

Floodplain. An area of land that is subject to natural flooding from an adjoining waterway.

Groin. A low wall or other rigid barrier built out into the sea from a beach to reduce erosion, trap sand, or direct a current for scouring a channel.

Impairment of resources. An impact so severe that, in the professional judgment of a responsible park manager, it would harm the integrity of park resources or values and violate the 1916 National Park Service Organic Act.

Implementation. Actions taken to achieve a long-term goal.

Implementation plan. A plan to carry out an activity or project to achieve a long-term goal. An implementation plan may direct a specific project or an ongoing activity.

Infrastructure. The basic facilities, services, and installations needed for the functioning of the park, such as transportation and communications systems and water and power lines.

Interpretation. As used in the National Park Service, the explanation to the public of the importance and meaning of NPS resources.

Littoral drift. Transport of sand or other materials along a coastline by longshore current.

Management areas. The designation of geographic areas of the park depending on the resource conditions and visitor experiences desired. Also referred to as management zones.

Mitigating measures. Modification of a proposal to lessen the intensity of its impact on a particular resource.

National Historic Landmark. Nationally significant properties in American history and archeology; recognition established through the Historic Sites Act of 1935; official list maintained by the National Park Service on behalf of the Secretary of the Interior.

National Register of Historic Places. (National Register) The official list of historically significant national, state, and local districts, sites, buildings, structures, and objects maintained by the National Park Service on behalf of the Secretary of the Interior; established through the National Historic Preservation Act of 1966.

Native species. Plants and animals present as a result of natural processes in parks.

Natural resources. Collectively, physical resources, such as water, air, soils, topographic features, geologic features, and natural soundscapes; biological resources such as native plants, animals, and communities; and physical and biological processes such as weather and shoreline migration, and photosynthesis, succession, and evolution.

Nonnative species. Species that occupy or could occupy parklands directly or indirectly as the result of deliberate or accidental human activities.

Organic Act. (National Park Service) The 1916 law (and subsequent amendments) that created the National Park Service and assigned it responsibility to manage the national parks.

Park partner. Any state or local government (or subdivision thereof), public or private agency, organization, institution, corporation, individual, or other entity which is engaged in helping to ensure the protection, enhancement and enjoyment of the park's natural, cultural and recreation heritage.

Preservation. The application of measures to sustain the existing form, integrity, and material of a historic structure, landscape, or object. May include preliminary measures to protect and stabilize the property, but generally refers to the ongoing preservation, maintenance, and repair of historic materials and features rather than extensive replacement and new work. For historic structures, exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Recurring Maintenance. Preventive maintenance activities that recur on a periodic and scheduled cycle of greater than 1 year, but less than 10 years.

"Reference Standard Wetlands". A group of wetlands that represents the range of variation of the same class and that maintains functions at characteristic levels for that class under unaltered or least altered conditions (Brinson 1998).

Reach. A continuous stretch or expanse of beach along the coast line.

Rehabilitation. Making possible an efficient, compatible use for a historic structure or landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, and architectural values.

Resiliency. The ability of a social or ecological system to absorb disturbance while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Restoration. Accurate depiction of the form, features, and character of a historic structure, landscape, or object as it appeared in a particular historic period by removing features from other periods and reconstructing missing features.

Sediment budget. The balance between sediment added to and removed from the coastal system; in this respect the coastal sediment budget is like a bank account. When more material is added than removed, there is a surplus of sediment and the shore builds seaward.

Shorebird. A bird that uses the coastal shore for feeding, resting, or nesting.

Species of Special Concern. A species likely to become a threatened species.

Stabilization. Rendering an unsafe, damaged, or deteriorated property stable while retaining its present form.

Stakeholder. An individual, group, or other entity that has a strong interest in decisions concerning park resources and values. Stakeholders may include, for example, recreational user groups, permittees, and concessioners. In the broadest sense, all Americans are stakeholders in the national parks.

Stewardship. The cultural and natural resource protection ethic of employing the most effective concepts, techniques, equipment, and technology to avoid or mitigate impacts that would compromise the integrity of park resources.

Storm surge. The abnormal rise of water generated by the winds of a storm, over and above that from predicted astronomic tides.

Strategic plan. A National Park Service five-year plan that lays out goals and management actions needed in the near term to implement the general management plan.

Sustainability. The quality of integrating economic, environmental, and equity (health and well-being of society) considerations in decisions so that the Earth's resources are passed on to future generations in a healthy and abundant manner

Sustainable design. Design that applies the principles of ecology, economics, and ethics to the business of creating necessary and appropriate places for people to visit, live, and work. Development that has been sustainably designed sits lightly upon the land, demonstrates resource efficiency, and promotes ecological restoration and integrity, thus improving the environment, the economy, and society.

Sustainable practices/principles. Choices, decisions, actions, and ethics that will best achieve ecological/biological integrity; protect qualities and functions of air, water, soil, and other aspects of the natural environment; and preserve human cultures. Sustainable practices allow for use and enjoyment by the current generation, while ensuring that future generations will have the same opportunities.

Threatened. A species likely to become an endangered species within the foreseeable future through all or a portion of its range.

Traditional. Pertains to recognizable, but not necessarily identical, cultural patterns transmitted by a group across at least two generations. Also applies to sites, structures, objects, landscapes, and natural resources associated with those patterns. Popular synonyms include "ancestral" and "customary." traditionally associated peoples. May include park neighbors, traditional residents, and former residents who remain attached to a park area despite having relocated. Social or cultural entities such as tribes, communities, and kinship units are "traditionally associated" with a particular park when (1) the entity regards park resources as essential to its development and continued identity as a culturally distinct people; (2) the association has endured for at least two generations (40 years); and (3) the association began prior to establishment of the park.

Viewshed. The area that can be seen from a particular location, including near and distant views.

Visitor. Anyone who uses a park's interpretive, educational, or recreational services.

Waterfowl. Wild game birds, such as ducks or geese, that swim.

Wayfinding. The ways in which people and animals orient themselves in physical space and navigate from place to place. Wayfinding is typically used in the context of the built environment to refer to the user experience of orientation and choosing a path, but it also refers to the set of architectural and/or design elements that aid orientation.

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Fire Island National Seashore General Management Plan
National Park Service
15 State Street, 10th Floor
Boston, Massachusetts 02109