



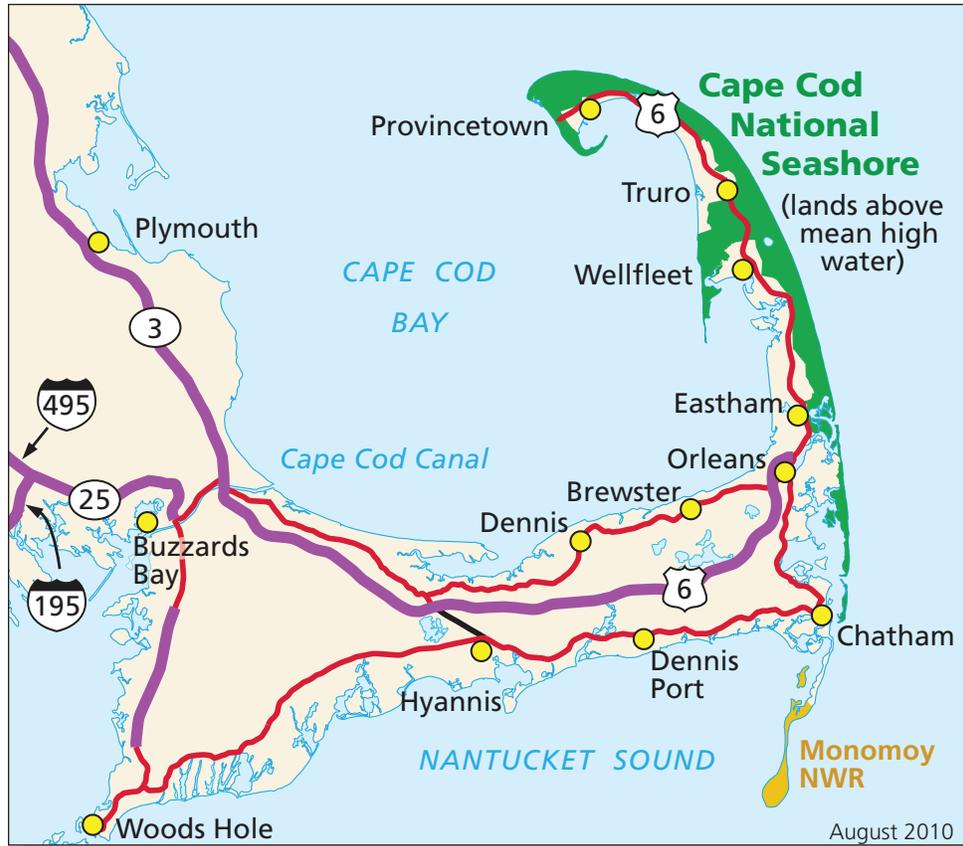
Foundation Document

Cape Cod National Seashore

Massachusetts

July 2018





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Mission of the National Park Service

The National Park Service (NPS) 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 National Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The NPS core values are a framework in which the National Park Service accomplishes its mission. They express the manner in which, both individually and collectively, the National Park Service pursues its mission. The NPS core values are:

- **Shared stewardship:** We share a commitment to resource stewardship with the global preservation community.
- **Excellence:** We strive continually to learn and improve so that we may achieve the highest ideals of public service.
- **Integrity:** We deal honestly and fairly with the public and one another.
- **Tradition:** We are proud of it; we learn from it; we are not bound by it.
- **Respect:** We embrace each other's differences so that we may enrich the well-being of everyone.

The National Park Service is a bureau within the Department of the Interior. While numerous national park system units were created prior to 1916, it was not until August 25, 1916, that President Woodrow Wilson signed the National Park Service Organic Act formally establishing the National Park Service.

The national park system continues to grow and comprises more than 400 park units covering more than 84 million acres in every state, the District of Columbia, American Samoa, Guam, Puerto Rico, and the Virgin Islands. These units include, but are not limited to, national parks, monuments, battlefields, military parks, historical parks, historic sites, lakeshores, seashores, recreation areas, scenic rivers and trails, and the White House. The variety and diversity of park units throughout the nation require a strong commitment to resource stewardship and management to ensure both the protection and enjoyment of these resources for future generations.



The arrowhead was authorized as the official National Park Service emblem by the Secretary of the Interior on July 20, 1951. The sequoia tree and bison represent vegetation and wildlife, the mountains and water represent scenic and recreational values, and the arrowhead represents historical and archeological values.

Introduction

Every unit of the national park system will have a foundational document to provide basic guidance for planning and management decisions—a foundation for planning and management. The core components of a foundation document include a brief description of the park as well as the park’s purpose, significance, fundamental resources and values, other important resources and values, and interpretive themes. The foundation document also includes special mandates and administrative commitments, an assessment of planning and data needs that identifies planning issues, planning products to be developed, and the associated studies and data required for park planning. Along with the core components, the assessment provides a focus for park planning activities and establishes a baseline from which planning documents are developed.

A primary benefit of developing a foundation document is the opportunity to integrate and coordinate all kinds and levels of planning from a single, shared understanding of what is most important about the park. The process of developing a foundation document begins with gathering and integrating information about the park. Next, this information is refined and focused to determine what the most important attributes of the park are. The process of preparing a foundation document aids park managers, staff, and the public in identifying and clearly stating in one document 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.

While not included in this document, a park atlas is also part of a foundation project. The atlas is a series of maps compiled from available geographic information system (GIS) data on natural and cultural resources, visitor use patterns, facilities, and other topics. It serves as a GIS-based support tool for planning and park operations. The atlas is published as a (hard copy) paper product and as geospatial data for use in a web mapping environment. The park atlas for Cape Cod National Seashore can be accessed online at: <http://insideparkatlas.nps.gov/>.



Part 1: Core Components

The core components of a foundation document include a brief description of the park, park purpose, significance statements, fundamental resources and values, other important resources and values, and interpretive themes. These components are core because they typically do not change over time. Core components are expected to be used in future planning and management efforts.

Brief Description of the Park

Cape Cod, a slender spit of land curving some 60 miles out into the Atlantic Ocean, is an extraordinary resource, an area that is strikingly lovely and unusual in its combination and diversity of resources. Its unsurpassed beaches, ponds, marshes, bays, pine barrens, inlets, and dunes combine with historic landscapes and thriving communities to create an intricate mosaic. Cape Cod National Seashore was authorized in 1961 to preserve a part of this fascinating, ever-changing landscape.

Cape Cod is one of the largest glacially formed peninsulas in the world, and the Great Beach, on the Atlantic side, is one of the longest expanses of uninterrupted sandy shoreline on the East Coast. Natural change on the Cape is constant and dramatic, especially along the ocean shore. Within the national seashore the action of wind, waves, tides, and rain remains mostly unaffected by development, providing a rare opportunity to observe their effects on the land and shoreline formations.

The lands and waters of the national seashore comprise about 44,000 acres (varies depending on the location of the low tide shoreline for parts of the outer Cape). The nonmarine land and water area totals about 26,810 acres. Based on recent aerial mapping, that area includes 3,375 acres of grassland, 895 acres of heathland, 3,765 acres of deciduous forest, 11,500 acres of mixed pine forest, 2,550 acres of wetlands and ponds, 1,875 acres of salt marsh, 1,700 acres of beach and tide flats, and 1,150 acres of developed land.

The Cape's prominent position in the Atlantic has long made it a key location for human settlement; archeological sites testify to more than 9,000 years of occupation. This long period of continuous human settlement has produced occupations, folkways, and pastimes that have been singular developments in American history. By the 1600s the Wampanoag Indians used or inhabited all the lands now within the national seashore. In 1620 Cape Cod was the first landfall for the Pilgrims and the site of the creation of the Mayflower Compact.

With European settlement, Cape Codders took to the sea, creating whaling and fishing industries as well as a long and famous tradition of shellfishing. This seafaring heritage is reflected in the many lighthouses and lifesaving and Coast Guard stations that dot the Cape. Settlers were the architects of a style of dwelling with a steep roof to shed the rain and snow and low to the ground to withstand buffeting winds; this style came to be known as the Cape Cod house, recognized throughout the United States.

Cape Cod has also been the site of significant technological achievements. The first transatlantic cable was laid between Cape Cod and France in 1866. In 1903 Guglielmo Marconi was instrumental in successfully sending and receiving the first exchange of transatlantic wireless messages between President Theodore Roosevelt and King Edward VII. More recently, the Cape has played a role in the research and development of long-range radar.

Cape Cod's beauty, sense of solitude, and other aesthetic values have created a place for people to come for inspiration and renewal for more than 100 years. These attributes have also inspired generations of artists and writers. Edward Hopper, Mark Rothko, Jackson Pollock, Henry David Thoreau, John Dos Passos, and Mary McCarthy are only a few who have created a rich tradition of contributions to the arts. Cape Cod continues to be recognized for its special charm and unique ambience, and its proximity to densely populated and developed areas makes its special character all the more important to preserve.

Park Purpose

The purpose statement identifies the specific reason(s) for establishment of a particular park. The purpose statement for Cape Cod 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 initial enabling legislation was passed and signed into law on August 7, 1961 (see appendix A for enabling legislation). The purpose statement lays the foundation for understanding what is most important about the park.

The purposes of CAPE COD NATIONAL SEASHORE are to preserve the nationally significant and special cultural and natural features, distinctive patterns of human activity, and ambience that characterize the Outer Cape, along with the associated scenic, cultural, historic, scientific, and recreational values, and to provide opportunities for current and future generations to experience, enjoy, and understand these features and values.



Park Significance

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 Cape Cod 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 systemwide context. They focus on the most important resources and values that will assist in park planning and management.

The following significance statements have been identified for Cape Cod National Seashore. (Please note that the sequence of the statements does not reflect the level of significance.)

1. Cape Cod is one of the largest glacial peninsulas in the world, and the Great Beach on the Atlantic side of the Cape is one of the longest uninterrupted sandy shorelines on the East Coast, making it an exceptionally important, ecologically intact beach ecosystem.
2. The dynamic natural coastal processes that continually reshape the Cape are directly impacted by the effects of climate change and are possible to observe and document.
3. Cape Cod National Seashore contains some of the largest unfragmented tracts of uplands and wetlands remaining on Cape Cod, which are essential to maintaining ecological integrity and which provide habitats vital for many plant and animal species. The national seashore encompasses natural resources such as heathlands, coastal pine barrens, kettle ponds, spadefoot toads, shorebirds, and right whales that are regionally and/or globally rare, yet locally abundant.
4. Cape Cod's prominent position, jutting into the Atlantic at a northerly latitude, makes it a significant resource for migratory species, including several whale, bird, and turtle species that are threatened or endangered.
5. Cape Cod was the site of early contact between native and European cultures. The national seashore encompasses archeological sites that document more than 9,000 years of occupation, including use by Wampanoag Indians that continues to this day. The Pilgrims landed first on Cape Cod when they arrived in America in 1620. In Provincetown harbor, they drafted and signed the Mayflower Compact.
6. Over centuries of habitation, maritime occupations (whaling, fishing, and lifesaving), as well as distinctive lifeways, community life, and architecture, have developed in response to the location of Cape Cod.
7. Cape Cod's geographic location has made it the site of significant technological achievements in communication, including the first transatlantic cable, the first exchange of transatlantic wireless messages, the development of long-range radar, and, recently, the development of emerging technologies.
8. Cape Cod's beauty, solitude, and aesthetic values have offered inspiration and renewal for more than 100 years and contributed to a rich artistic and architectural heritage. Proximity to densely populated areas of the Northeast makes the Cape accessible to millions.



Fundamental Resources and Values

Fundamental resources and values (FRVs) are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. Fundamental resources and values are closely related to a park’s legislative purpose and are more specific than significance statements.

Fundamental resources and values help focus planning and management efforts on what is truly significant about the park. One of the most important responsibilities of NPS managers is to ensure the conservation and public enjoyment of those qualities that are essential (fundamental) to achieving the purpose of the park and maintaining its significance. If fundamental resources and values are allowed to deteriorate, the park purpose and/or significance could be jeopardized.

The following fundamental resources and values have been identified for Cape Cod National Seashore.

Natural Resources

- **Beaches, Barrier Islands, and Spits.** Cape Cod is composed almost entirely of material deposited by glaciers about 14,000–18,000 years ago. Wind and water reworked these sediments to create the landforms we know today—beaches, spits, marshes, hollows, cliffs, and dunes. Coastal processes such as tides, winds, storms, and longshore sediment transport continue to shape and reshape the area. Cape Cod’s outer beach is renowned for its long, mostly undeveloped expanses of sand.

In addition to their value as habitat, the natural landforms of the Cape help protect landward areas from storms and coastal flooding. Beaches and marshes dissipate the energy of storm waves over their gradual slopes and buffer the direct impact of waves on inland areas.

Low-lying barrier beaches and coastal dunes separate open water or wetland systems from the ocean. Barrier islands and spits, and their inlets, are fundamental to the development of rich biological resources in the protected, low-energy estuaries and salt marshes behind them. Barrier beaches migrate slowly inland and downdrift with the moving sands; this movement maintains their elevation and protective capability relative to rising sea level and storm forces.

These sandy environments support a number of rare plants and animals that are attuned to specific habitats and comprise a complex assemblage of different landforms, environments, habitats, land cover, and land uses.





- **Estuaries and Salt Marshes.** Eight major marsh and estuarine systems are present within the national seashore. These zones of fresh and salt water mixing are very productive environments that serve as nursery grounds for many marine species and provide critical foraging habitat for numerous species of resident and migratory wildlife, both from land and sea.
- **Freshwater Ponds, Wetlands, and Aquifer.** The seashore supports such a large and diverse number of native plant and animal communities because of the great abundance and variety of freshwater ponds and wetlands in close juxtaposition with nearby marine and upland habitats. Closely linked to the diversity of the freshwater wetlands are the hydrological processes associated with groundwater, which greatly influence the ecology of ponds, streams, and other wetland, coastal, and terrestrial systems throughout the national seashore. In addition to these ecological values, Cape Cod National Seashore and the surrounding communities rely solely on this groundwater as their source of freshwater. Thus, it is not difficult to understand the importance of groundwater as a resource on the Outer Cape and why groundwater resources on Cape Cod are protected by the U.S. Environmental Protection Agency as a sole source aquifer.

The freshwater ponds and lakes of the national seashore can be divided by geologic origin into two types—dune ponds and kettle ponds. Within each type, ponds may be permanent, semipermanent, or temporary (e.g., vernal ponds).

- **Nearshore Marine Resources.** At Cape Cod National Seashore, nearshore marine resources include wildlife, benthic resources that provide a food source for many fish, sand and sediment environments, and other marine life within a quarter mile of the marine boundary.

- **Coastal Uplands.** Most of Cape Cod National Seashore is coastal upland. These terrestrial habitats consist primarily of pine-oak or pitch pine forest, but significant amounts of beech forest, grassland, heathland, and scrub oak thickets add to the habitat diversity, which in turn helps support much of the seashore’s plant and wildlife diversity. This habitat diversity existed prior to European contact and is created and maintained by natural processes such as wildfire, storms, wind, salt spray, and “poor” soils, as well as by the use of fire by American Indians.

Most of the seashore’s uplands were cleared for agriculture during the 17th and 18th centuries, but with the abandonment of agriculture that began in the 19th century and the ongoing process of forest succession, the seashore’s uplands are once again dominated by forest. As the seashore’s forests expand and mature, forest wildlife extirpated long ago is recolonizing the seashore.

In addition to forests, the seashore contains coastal grasslands, heathlands, and shrublands, which are open landscapes dominated by low-growing shrubs and grasses, with few trees. These communities are among the highest priorities for conservation in the Northeast because they support a unique flora and the greatest concentration of rare or uncommon upland plant and animal species in the region. The now extinct heath hen is an example of a once common regionally endemic species adapted to these open habitats.

Protected heathlands are very rare in North America and globally uncommon. As the largest conservation area in the region, Cape Cod National Seashore’s coastal plain grasslands and heathlands are significant due to their extent and level of protection. Approximately 670 acres of heathlands are present in nine major areas in the seashore, and 3,375 acres of grassland-dominated habitat are also present.

- **Wildlife and Fish.** More than 570 species of fish, amphibians, reptiles, birds, and mammals and unknown hundreds of invertebrate animals depend on the diversity of upland, freshwater, and coastal ecosystems at Cape Cod National Seashore. Depending on the species, the national seashore may provide habitat year round or only during nesting season, migration, or winter. Many of the seashore’s wildlife species require different habitat types for different life stages or to meet different needs, and many species use both terrestrial and marine or freshwater habitats. The seashore’s landscape of relatively large unfragmented habitat patches provides wildlife the opportunity to move between habitats with reduced risk of road kill and provides important habitat for forest interior neotropical migrants and disturbance-sensitive species. The abundance and diversity of wildlife in the seashore is attributable to the amount (acreage) and diversity of habitat types and to the seashore’s relatively undeveloped landscape.



- **Night Sky, Soundscape, and Air Quality.** The night sky and soundscape are resources that are important to wildlife and residents and a respite to people from urban areas who visit the national seashore.

Although much of the national seashore has noticeable light pollution, the area is still one of the darkest along the Northeast Coast. Beach, wetland, and prairie environments are thought to be among the most sensitive biomes to artificial light. Well-documented research indicates the deleterious effects of artificial light on sea turtles, migrating birds, and wetland species. Night sky friendly planning is now recognized as an important and integral part of facility design.

Cape Cod National Seashore provides a high quality experience of natural quiet in three seasons.

Air quality is an essential aspect of environmental health. Cape Cod is the recipient of a “pool” of pollutants that forms over the industrialized Midwest and heavily populated Northeast corridor. The atmosphere plays a critical role throughout natural systems as it influences the cycling of nutrients such as nitrogen and carbon and other elements and minerals such as sulfur, mercury, and particulate matter, as well the formation of ground-level ozone and atmospheric haze.

Knowledge about long-term trends in air quality related parameters such as precipitation, chemical constituents in wet and particulate deposition, and ground-level ozone are paramount in understanding and interpreting changes to visibility, water and soil chemistry, and species composition throughout the seashore’s major ecosystems. Nationally established long-term monitoring programs for precipitation and wet deposition date back to 1981. Additional monitoring of ground-level ozone and regional haze, in collaboration with Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency, is also conducted.

Cultural Resources

- **Truro Highlands Historic District.** The Truro Highlands Historic District includes the Highland Light Station and Keeper’s Quarters, Highland House, Highland Golf Links and Clubhouse, and the Rock, Haven, and Bennett Cottages. The Truro Highlands Historic District is listed in the National Register of Historic Places for entertainment and recreation, landscape architecture, and architecture, and its period of significance is 1898–1958. The Truro Highlands Historic District contains elements of a summer resort complex that originated in the late 1800s, during the first period of tourism on Cape Cod and before the coming of the railroad, and reached its fullest development in 1920.
- **Coastal Lifesaving Heritage Sites.** The presence of lighthouses standing guard over the Great Beach is a reminder that the waters of the Outer Cape were once among the most treacherous of the Atlantic Coast due to strong currents, storms, and numerous sandbars. Numerous efforts were undertaken in the 19th and 20th centuries to make coastal shipping less dangerous, including the construction of lighthouses and the establishment of the U.S. Life Saving Service, the predecessor of today’s U.S. Coast Guard, which was a major step in aiding shipwreck victims. Although the Cape Cod Canal (opened in 1914) greatly diminished the need for lighthouses on Cape Cod, those that remain link the landscape with its maritime past.

Historic structures owned by the National Park Service that represent the coastal lifesaving heritage of the Outer Cape include Nauset Coast Guard Station, Nauset Light, and Three Sisters lighthouses in Eastham; Highland Light and Pamet River Coast Guard Station in Truro; and Old Harbor Life-saving Station and Race Point Coast Guard Station in Provincetown.



- **Dune Shacks of the Peaked Hill Bars Historic District.** The Dune Shacks of Peaked Hill Bars Historic District is an approximately 1,960-acre, oceanfront cultural landscape that emerged as an isolated and informal seasonal retreat sought for recreation and creative expression. It consists of a group of dispersed rustic shelters sited among a string of shifting coastal sand dunes, with sweeping views of the pristine natural environment. The district is on the north, or “back shore” side of Provincetown and Truro. It encompasses more than 5 miles of undeveloped coastline between Race Point Beach and High Head Road. The district includes 18 dune shacks and the dune landscape that surrounds the shacks. All of the shacks were initially built between the 1920s and early 1950s, but most were rebuilt and/or moved back from the shoreline during the late 20th century. The dune shacks are owned by the National Park Service and leased to various tenants.

The Dune Shacks of the Peaked Hill Bars Historic District is listed in the national register as nationally significant. It meets national register criteria for being significant in the historical development of American art, literature, and theater, for its association with the life of American poet Harry Kemp, and for its architecture. The period of significance is about 1920–1991. A Dune Shacks district preservation and use plan was completed in 2012.

- **Fort Hill Rural Historic District.** Located in Eastham, the Fort Hill Rural Historic District occupies an elevated, open area of land that provides expansive views of the Nauset Marsh and Atlantic Ocean. The district encompasses 96.5 acres of federal and 3.5 acres of privately owned land. The Fort Hill Rural Historic District, which is listed in the national register, is significant for its areas of agriculture, community development, and architecture. It also derives significance for its potential to reveal significant information regarding the Historic Contact period.

The historic district has three zones: the historic structures on Fort Hill Road, open fields, and the Red Maple Swamp. The historic structures include the Captain Edward Penniman house and barn, Burrill (formerly Seth Knowles) house, Avery (formerly Sylvanus Knowles) house, long stone walls, stone boundary markers, and several archeological features including a sharpening rock used by American Indians.

- **Nauset Archeological District.** The Nauset Archeological District is a national historic landmark district in Eastham. The area was a focus of substantial ancient settlement since at least 4,000 BC, and the Indians at Nauset Harbor practiced farming and fishing. The first written account of the area was by Samuel de Champlain in 1605, when he observed a bay with wigwams bordering it. Champlain recorded that about 150 people were living around Nauset Harbor. After 1620, English colonists from the settlement at Plymouth visited Nauset to buy food and trade. Unfortunately, European diseases for which the Indians had no immunity were spread by these contacts. Many of the Nauset Indians died and the population declined drastically. In 1639 about half the English from Plymouth relocated to the Nauset area, settling the town that is now Eastham. The district is near the Fort Hill area off Nauset Marsh.

- **Archeological Sites (upland and submerged).**

People have lived on the outer part of the hook of land that forms Cape Cod for thousands of years. Cape Cod and the islands of Martha's Vineyard and Nantucket were formed as massive terminal moraines at the end of the last glacial period in North America about 15,000 years ago. Ancient artifacts, such as Paleo-Indian projectile points found at several locations on Cape Cod indicate that humans have occupied this land, or at least traversed it for the last 10,000 years. . . The interpretation of ancient and historic activities at these sites provides a view of human uses of the Cape Cod coastline from earliest times.

By 5,000 years ago, the human presence on Cape Cod was quite extensive. Artifacts, projectile points in particular, dating from this period are found throughout the Cape; however, sites are rare. It may also be that the remains of such settlements are buried deeply and are rarely found and investigated by archeologists. By 3,000 years ago, people left dense deposits of ancient trash, including discarded stone tools, stone flakes used as tools or from tool sharpening, shell from intensive gathering of shellfish for food, fish and animal bone, and ash and stone from fires for cooking and heat. These are found at sites in the Nauset area and probably exist in other areas where settlement was concentrated.

Francis P. McManamon, National Park Service, retired Chief Archeologist

- **Museum and Archival Collections.** According to the national seashore's scope of collection statement (2013), the national seashore's archeology collection includes more than a half million items and 100,000 archival records. Its historical collection includes about 13,000 items that pertain to the national seashore's historical themes. Natural resource collections include herbarium sheets, mounted insects, wet specimens, and records related to these specimens.
- **Marconi Station Site (commemorative site).** The Marconi Station Site is a ruin of the wireless station where Guglielmo Marconi transmitted the wireless telegraphic message between Europe and the United States on January 18, 1903. The message was between President Theodore Roosevelt and British King Edward VII. With rapid advances in technology, the station became outdated and was closed in 1917. It was replaced by a station in Chatham. Marconi chose this location because of the barrenness of this elevated table land overlooking the ocean.



Visitor Experience

- **Salt Pond Visitor Center and Province Lands Visitor Center.** Northern and southern visitor facilities provide the visitor to the national seashore fundamental exposure to and education about the seashore. The visitor facilities serve as hubs for visitors enabling them to branch off to other experiences (e.g., views, trail heads, picnic areas).

The Salt Pond Visitor Center (1965) in Eastham and the Province Lands Visitor Center (1969) in Provincetown provide essential visitor services and orientation to national seashore resources and activities. The visitor centers exhibit important Cape Cod archeological and historical artifacts from the national seashore’s collection. The exhibits are an important means of interpreting the history and nature of the Cape Cod National Seashore.

- **NPS-Lifeguarded Beaches.** There are six NPS-managed lifeguarded beaches: Coast Guard Beach, Nauset Light Beach, Marconi Beach, Head of the Meadow Beach, Race Point Beach, and Herring Cove Beach. Each beach has its own interesting natural features, and some have cultural associations. Each beach is a complex that encompasses buildings and infrastructure including bathhouses, restrooms, parking, access roads and trails, and other visitor amenities that provide a fundamental quintessential noncommercial beach experience.

Fundamental and important experiences abound on the beach. The lifeguarded beaches draw hundreds of thousands of visits due to their attraction for swimming, walking, surfing, fishing, watching sunrises and sunsets, and viewing seabirds, seals, and whales. The National Park Service strives to provide access to public use areas that is environmentally sensitive, safe, and consistent with the desired experience and the intermodal planning initiatives.

Because of high bluffs limiting access at other areas along the Atlantic Coast, maintaining existing public beach access is of paramount importance, and beach erosion and climate change effects call for swift attention and remediation, such as emergency stairway replacements, to maintain safe beaches.

- **Cape Cod Experience.** The Cape Cod National Seashore legislation recognized the need to preserve local traditional activities. Many of these activities are a product of the Cape’s geographic location and the forces that created it. The area’s character is intricately tied to the ways of life of local communities. Traditional activities, which had an economic purpose, have included fishing, shellfishing, hunting, cultivating cranberries, and harvesting beach plums, berries, and mushrooms. Recreational activities, which were introduced in the late 19th and 20th centuries, have included swimming, sunbathing, surfcasting, surfing, hiking, birding, wildlife observation, and enjoying scenic views.



Partnerships

- Cape Cod Model.** Cape Cod National Seashore was established with a pattern of land ownership and management that is unusual in the national park system. Traditional national parks have been carved from sparsely populated land already in the public domain, whereas most of the land on Outer Cape Cod had long been densely populated and in private hands. The Province Lands area in Provincetown is also known as the second-oldest “common lands” in the nation, second only to Boston Common; it was put aside in the 1600s by Plymouth Colony as a fisheries reserve.

The 1961 park legislation created a new “Cape Cod Formula/Model,” in which the National Park Service would acquire public lands but not acquire all of the private land within the park’s boundary. The federal power of condemnation to acquire property for public use was limited in favor of requiring town governments to enact zoning ordinances that would maintain current usage for properties within the new park’s boundary and protect the local landscape.

The legislation also allowed traditional hunting, fishing, and shellfishing within the park. Congress eventually appropriated \$15 million for the new park, which was the first time federal money was appropriated to directly acquire land for the creation of a national park.

- Cape Cod National Seashore Advisory Commission.** The Cape Cod National Seashore Advisory Commission was first authorized in the 1961 enabling legislation. The purpose of the commission is to consult with the Secretary of the Interior, or his or her designee, about matters relating to the development of Cape Cod National Seashore and specific sections of the act establishing the seashore. Commissioners are appointed by the Secretary of the Interior and represent the six towns within the seashore’s boundary, as well as Barnstable County, the Commonwealth of Massachusetts, and the Secretary of the Interior. The superintendent is the designated federal officer and is not a voting member of the commission.



Other Important Resources and Values

Cape Cod National Seashore contains other resources and values that are not fundamental to the purpose of the park and may be unrelated to its significance, but are important to consider in planning processes. These are referred to as “other important resources and values” (OIRV). These resources and values have been selected because they are important in the operation and management of the park and warrant special consideration in park planning.

The following other important resources and values have been identified for Cape Cod National Seashore.

Cultural Resources

- Sites Related to the Outer Cape’s Cultural Heritage.** Several historic structures have stories to tell about different iterations of the Outer Cape economy. The Atwood-Higgins House represents an early and intact example of the Cape’s transition from industrial decline and remoteness to tourist destination. The nearby Baker-Biddle House was the birthplace of Lorenzo Dow Baker, who launched the modern banana production industry, and was later rehabilitated as a vacation home for the wealthy elite. There is also a historic bog house that tells a story of the cranberry industry on Cape Cod.
- Mid-Century Modern Homes.** Mid-20th century Modern residential architecture on Outer Cape Cod is the subject of a National Register Multiple Property nomination. At least 160 mid-20th century Modern, single-family houses were built by more than 20 identified architects and design/builders in Eastham, Wellfleet, Truro, and Provincetown. The period of significance of these summer residences is 1929–1979. This was a prolific period of incubating and experimenting with Modern residential architecture by noted international, regional, and local architects including Marcel Breuer, Serge Chermayeff, Nathaniel Saltonstall, Paul Weidlinger, Hayden Walling, Jack Phillips, Jack Hall, Olav Hammarstrom, Charlie Zehnder, Paul Krueger, and others aspiring to build Modern seasonal houses on the Outer Cape. Bauhaus founder Walter Gropius, who spent time at some of these Modern houses, influenced the designs of many of the architects. The end of the period is punctuated by Charles Jencks’ Postmodern “Garagia Rotunda” of 1976–1977 in Truro, erected the year he published his influential book, *The Language of Postmodern Architecture*.

These summer houses exhibit a unique variant of Modern architecture that flourished in the years following World War II. They are simple and economic houses with minimalist designs that are an experimental exercise and an environmentally driven response to the regional climate and locally available materials.

The largest concentration of these houses is The Colony in Wellfleet outside the park boundary.



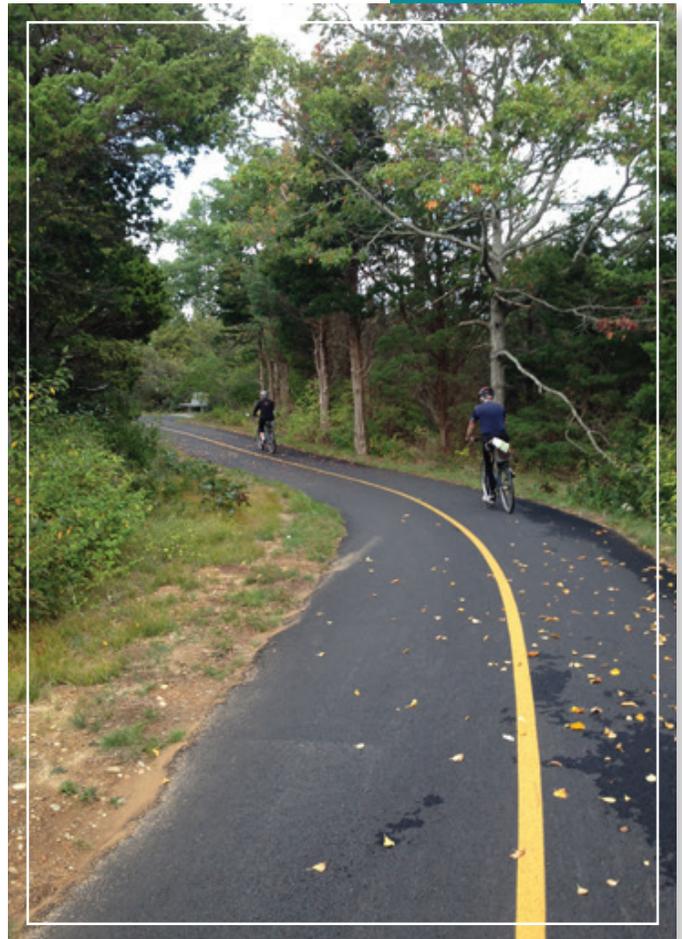
Visitor Experience

- **Atlantic Research and Learning Center.** The Atlantic Research and Learning Center is one of a nationwide network of research learning centers maintained and operated by the National Park Service. It was created by charter in 1999 as a component of the NPS Natural Resource Challenge. This initiative was part of a broad effort by the National Park Service to expand the role of science inside parks in the 21st century. The fundamental aims of the learning centers are to increase and expand upon scientific research taking place within national parks; to foster research that will contribute to management decisions; and to provide educational opportunities for students, universities, educators, and the public.

The center's research partners are typically from academic institutions, state and federal agencies, and nonprofit conservation science organizations. Research partners are granted access to park facilities via the NPS research permit program and benefit from the expertise and guidance of the national seashore's scientists, laboratory and field support, and decades of baseline data from the national seashore's long-term ecological monitoring program. The national seashore's staff is charged with conducting an active inventory and monitoring program, Cape Cod Ecosystem Monitoring, that has collected and analyzed decades of long-term monitoring data. These data provide resource status and trend information that can serve as context for research activities and results. In turn, the center's research results help describe cause and effect relationships for observed changes to national seashore resources.

- **Bicycle Trails.** The bicycle trails in the national seashore are recreational amenities constructed by the National Park Service in 1967. They are some of the first NPS bicycle trails in the country. Biking is a favorite activity of many visitors to Cape Cod National Seashore. There are three bike trails in the seashore: Nauset in Eastham, Head of the Meadow in Truro, and Province Lands in Provincetown. In addition, the Cape Cod Rail Trail, maintained by the Commonwealth of Massachusetts, extends for 22 miles between the towns of Dennis and Wellfleet.
- **Walking Trails and Picnic Areas.** The 1963 Cape Cod National Seashore master plan designates trails for biking, hiking, and horse riding. Most of the trails within the national seashore were identified in the master plan and constructed between 1965 and 1968. Typically, the trails were converted from established social trails or dirt/sand roads. For instance, part of the Atlantic White Cedar Swamp trail is a dirt road built in 1903. Trails established later in the seashore's history include the Buttonbush Trail, which was designed in the 1970s in cooperation with the sight-impaired community, and the Woods Walk at the Highlands Center, which opened in the mid-2000s.

The 12 designated self-guided hiking trails include Eastham's Fort Hill Trail, Red Maple Swamp Trail, Buttonbush Trail, Nauset Marsh Trail, and Doane Trail; Wellfleet's Atlantic White Cedar Swamp Trail and Great Island Trail; Truro's Pamet Area Trails, Woods Walk at Highlands Center, Small's Swamp Trail, and Pilgrim Spring Trail; and Provincetown's Beech Forest Trail.



Related Resources

Related resources are not owned by the park. They may be part of the broader context or setting in which park resources exist, represent a thematic connection that would enhance the experience of visitors, or have close associations with park fundamental resources and the purpose of the park. The related resource represents a connection with the park that often reflects an area of mutual benefit or interest, and collaboration, between the park and owner/stakeholder.

The following related resources have been identified for Cape Cod National Seashore.

- **Cross Boundary Estuarine/Riverine Resources.** Many natural resources extend beyond the boundary of the national seashore, particularly in the case of river and salt marsh environments, and collaborative management of those environments is needed to ensure their health and vitality as habitats for flora and fauna. In Wellfleet, these include Fresh Brook, Blackfish Creek, Hatches Creek, and Herring River, in Truro the Pamet River and East Harbor, and in Provincetown the West End Marsh. Restoration efforts commonly include numerous parties because some resource areas have private, town, trust, and state, as well as federal, ownership.
- **Freshwater Ponds, Wetlands, and Aquifer.** Cape Cod National Seashore and the surrounding communities rely solely on this groundwater as their source of freshwater. Thus, it is not difficult to understand the importance of groundwater as a resource on the Outer Cape and why groundwater resources on Cape Cod are protected by the U.S. Environmental Protection Agency as a sole source aquifer. The freshwater ponds and lakes of the national seashore can be divided by geologic origin into two types—dune ponds and kettle ponds. Within each type, ponds may be permanent, semipermanent, or temporary (e.g., vernal ponds).
- **Contiguous or Nearby Nonfederally Owned Open Space.** The landscape of Cape Cod National Seashore is reinforced by protected conservation and open space lands owned by various nonprofit organizations. The Massachusetts Audubon Society owns the 937-acre Wellfleet Bay Wildlife Sanctuary on Wellfleet Harbor, and hundreds of trust lands are held by conservation trusts in each of the communities with support of the Compact of Cape Cod Conservation Trusts.

The Compact of Cape Cod Conservation Trust produced an 11-minute video describing the partnership between private landowners and the National Park Service to create Cape Cod National Seashore, emerging threats, and the work of nonprofit land trusts to save lands in and adjacent to the national seashore. In addition, the Compact published a booklet in 2013 titled, *To Live Lightly on the Land—A Guide to Private Land Protection in the Cape Cod National Seashore*.

- **Campgrounds.** Campgrounds provide an outdoor experience and affordable overnight accommodations in the national seashore environs. Information about lodging, including privately owned campgrounds within the national seashore and in surrounding towns, is provided by the chambers of commerce. There are three privately owned campgrounds within the national seashore in North Truro and four privately owned campgrounds adjacent to or near the national seashore in Provincetown, Wellfleet, and Eastham. Cape Cod National Seashore does not offer camping. Nickerson State Park is a nearby state campground in the Town of Brewster.
- **Outer Cape and Six Seashore Towns (Provincetown, Truro, Wellfleet, Eastham, Orleans, Chatham).** The six towns of the Outer Cape share a landscape with the national seashore and provide community character and context. The land area under anthropogenic use on the eastern Cape increased by 44% in the period 1971–1999, and this trend continues. Development of lands outside the national seashore is of significant concern because, in many cases, these lands are ecologically connected to natural resources within the national seashore. Impacts of residential and commercial development include habitat fragmentation and changes in groundwater quality and quantity.



- **External Viewsheds/Vistas.** Scenic views are an important feature in national parks, but often those views transcend park boundaries. Some very important scenic views in the national seashore extend from the park to the towns, ocean, and bay. Views from High Head across Cape Cod Bay to Provincetown Harbor, the 360-degree view at the Marconi Site Overlook, glimpses of the sea along Ocean View Drives in Wellfleet and Eastham, and views from Salt Pond Visitor Center across Nauset Marsh to the Atlantic Ocean are just a few of the iconic vistas.
- **Stellwagen Bank National Marine Sanctuary.** The most prominent submerged feature of Massachusetts Bay is a kidney-shaped plateau called Stellwagen Bank. Stellwagen Bank is a shallow, primarily sandy feature curving in a southeast to northwest direction for 19 miles. It is roughly 6 miles across at its widest point at the southern end. Water depths range from 65 to 600 feet.

Stellwagen Bank is the centerpiece of the Stellwagen Bank National Marine Sanctuary, which encompasses a total of 638 square nautical miles, or 842 square miles. The southern boundary of the bank is 3 miles from Provincetown. The sanctuary boundary is entirely within federal waters. The southern border is adjacent to the commonwealth-designated Cape Cod Bay Ocean Sanctuary and tangential to waters of the Cape Cod Ocean Sanctuary. There are many opportunities for collaborative presentation of mutual interests, and an exhibit on whale tracking is provided at the Province Lands Visitor Center.

- **Monomoy National Wildlife Refuge.** The U.S. Fish and Wildlife Service is responsible for the protection and management of lands and resources within the boundaries of the Monomoy National Wildlife Refuge situated within the Town of Chatham. The wildlife refuge provides important habitat for breeding and migrating waterbirds and is a nationally designated wilderness area and a Western Hemisphere Shorebird Reserve Network site. Because of shifting configurations of the area known as South Beach, there is now a land bridge between South Beach (also known as Nauset Beach) and Monomoy. The U.S. Fish and Wildlife Service and National Park Service jurisdictions were contiguous but now overlap in parts of the area known as South Beach within the national seashore's boundary. The wildlife refuge is a unique coastal environment with important natural resources that demand protection, as well as a popular public destination.

- **Cape Cod Rail Trail.** The Commonwealth of Massachusetts operates and maintains the Cape Cod Rail Trail, a multiuse/bicycle trail that follows a former railroad right-of-way for 22 miles through the towns of Dennis, Harwich, Brewster, Orleans, Eastham, and Wellfleet. Its paved surface, few hills, and well-marked automobile crossings make it ideal for cyclists. The trail has a wide unpaved shoulder on one side to accommodate horseback riding, walkers, and runners. A 2.3-mile section of the South Wellfleet portion of the trail is on land owned by the United States and has been used under agreement for more than 30 years. The trail provides for recreational and interpretive use of the national seashore via various information boards and wayside exhibits and trail information guides and maps.
- **U.S. Highway 6 / Massachusetts Highway.** U.S. Highway 6 is the major road providing vehicular access to the national seashore beginning at the Orleans rotary (Mile 90.6). Through Eastham and North Truro, U.S. Highway 6 is a four-lane surface street. Through Wellfleet and southern Truro, it was a three-lane road that has been converted to two lanes with shoulders. In Provincetown, it is locally maintained, and it ends at its meeting with Moors Road in the Cape Cod National Seashore. For the last several miles near Provincetown, U.S. Highway 6 east actually heads west-southwest.
- **Locally Owned Lifeguarded Beaches.** The Towns of Wellfleet and Truro each have four ocean beaches that contribute to the visitor amenities within the national seashore's boundary (Town of Truro: Head of the Meadow, Coast Guard Beach, Longnook Beach, and Ballston Beach; Town of Wellfleet: Newcomb Hollow Beach, Cahoon Hollow Beach, White Crest Beach, and LeCount Hollow Beach). Wellfleet also has Duck Harbor Beach on the bayside. Some beaches provide restrooms, whereas others simply provide parking and trash removal. Each offers access to the wide expanse of the Great Beach. Visitors typically do not differentiate who owns the beach, focusing more on the recreational and wellness beach experience. The local beaches are in good condition, and each poses differing challenges on retaining public access down the coastal bluff. Periodically there is a desire to expand parking for town parking on adjacent NPS land and/or investigation of beach shuttles. The National Park Service and the towns coordinate on beach regulations and fees.
- **Coast Guard-Owned Lighthouses.** Three lighthouses in Provincetown are within the national seashore boundary but owned and operated by the U.S. Coast Guard. The Cape Cod Chapter of the American Lighthouse Foundation is a nonprofit organization of volunteer members whose mission is the restoration and preservation of Race Point Lighthouse, its Keeper's house, Whistle house, and Oil house, and Wood End and Long Point Lighthouses. These facilities are within Cape Cod National Seashore and currently serve as navigational aids and present-day reminders of the maritime history of Cape Cod.
- **Privately Owned Historic Houses.** Throughout the seashore the landscape is peppered with historic houses. Some 18th and 19th century properties are in clusters, such as along Higgins Hollow Road in Truro. Numerous 20th-century Modern houses are in the Wellfleet woods and ponds. The wide array of architecture is modest and materials blend with nature so collectively they are defined as having a Cape aesthetic. In his 1963 submission to the Cape Cod National Seashore Advisory Commission, "On the Desirable Character of Design for the Cape Cod National Seashore," Walter Gropius wrote:

Well-meaning people may think that the old Cape Cod character should be kept frozen, believing that new buildings should be shrouded in an historical shell from the past. The Cape Cod shore is not a museum; it lives, it grows, it changes . . . Architecture must move on, or die.

Interpretive Themes

Interpretive themes are often described as the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit. Themes are derived from, and should reflect, park purpose, significance, resources, and values. The set of interpretive themes is complete when it provides the structure necessary for park staff to develop opportunities for visitors to explore and relate to all park significance statements and fundamental and other important resources and values.

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 Cape Cod National Seashore:

- **Natural Systems.** Cape Cod is the world's largest glacial peninsula and the longest uninterrupted sandy shoreline on the East Coast, with distinct ecosystem types supporting diverse habitats and species, which have been and will continue to be affected by natural and human-caused change.
- **Geography.** Cape Cod's geographic location at the edge of the continent, on the Atlantic Ocean, has profoundly influenced human activity from cultural land use, settlement, and exploration to transportation, industry, communication, and tourism.
- **Source of Inspiration.** For centuries, Outer Cape Cod has served as both a haven and subject for writers and artists, playing a key role in the historic development of art and literature in America, while also inspiring creative response in the development of architecture and tools.



Part 2: Dynamic Components

The dynamic components of a foundation document include special mandates and administrative commitments and an assessment of planning and data needs. These components are dynamic because they will change over time. New special mandates can be established and new administrative commitments made. As conditions and trends of fundamental and other important resources and values change over time, the analysis of planning and data needs will need to be revisited and revised, along with key issues. Therefore, this part of the foundation document will be updated accordingly.

Special Mandates and Administrative Commitments

Many 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 memorandums 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 Cape Cod National Seashore.

Special Mandates

Per the national seashore's enabling legislation, deed and conveyances, and special regulations, Cape Cod National Seashore operates under a number of special mandates.

- **16 USC 459 Cape Cod National Seashore**

- b-3 Acquisition by condemnation

- (b) Suspension of condemnation authority for one year and during existence of zoning regulations

- (c) Suspension of condemnation authority respecting property use for commercial or industrial purposes

- b-4 Zoning regulations

- (a) Standards for approval; submission to Congress and municipalities; publication in Federal Register; approval of local bylaws; revocation of approval

- b-5 Certificate of suspension of authority for acquisition by condemnation

- b-6 Administration of acquired property

- (b) Preservation of seashore; incompatible visitor conveniences restricted; provisions for public enjoyment and understanding; developments for recreational activities; public use areas

- (c) Hunting and fishing regulations; navigation

- b-7 Cape Cod National Seashore Advisory Commission

- (f) Consultation of Secretary with Commission

- **36 CFR 7.67 Special regulations.** (a) Off Road Operation of Motor Vehicles; (b) Aircraft; (c) Motorboats; (d) Shellfishing; (e) Public Nudity; (f) Hunting
- **36 CFR 1.2(a)(3) Waters subject to the jurisdiction of the U.S. located within the boundaries of the National Park System.** Waters subject to the jurisdiction of the United States located within the boundaries of the National Park System, including navigable waters and areas within their ordinary reach (up to the mean high water line in places subject to the ebb and flow of the tide and up to the ordinary high water mark in other places) and without regard to the ownership of submerged lands, tidelands, or lowlands.

Note: Cape Cod National Seashore has concurrent jurisdiction, as opposed to proprietary jurisdiction, of waters within its boundaries. Although Cape Cod National Seashore may not own the water, it does have jurisdiction.

Administrative Commitments

Cape Cod National Seashore relies heavily on collaboration with agencies at all levels of government, partnerships with educational institutions and other cooperators, and contracts with concessioners to accomplish a portion of the resource management and visitor programming at the national seashore. Some of these are long-standing arrangements such as the mutual aid agreements with the six Outer Cape towns, and others are limited to prescribed tenures such as concessions contracts awarded to manage various facilities such as the Highland Golf Links and food service at Herring Cove Beach. Each administrative commitment is unique to the particular task, relationship, or resource.

Assessment of Planning and Data Needs

Once the core components of part 1 of the foundation document have been identified, it is important to gather and evaluate existing information about the park's fundamental and other important resources and values, and develop a full assessment of the park's planning and data needs. The assessment of planning and data needs section presents planning issues, the planning projects that will address these issues, and the associated information requirements for planning, such as resource inventories and data collection, including GIS data.

There are three sections in the assessment of planning and data needs:

1. analysis of fundamental and other important resources and values
2. identification of key issues and associated planning and data needs
3. identification of planning and data needs (including spatial mapping activities or GIS maps)

The analysis of fundamental and other important resources and values and identification of key issues leads up to and supports the identification of planning and data collection needs.

Analysis of Fundamental Resources and Values

The fundamental resource or value analysis table includes current conditions, potential threats and opportunities, planning and data needs, and selected laws and NPS policies related to management of the identified resource or value.



Fundamental Resource or Value	Natural Resources: Beaches, Barrier Islands, and Spits
Related Significance Statements	Significance statements 1, 2, 3, 4, 6, and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Because they are relatively remote and less visited, in contrast to lifeguarded beaches, distal tips of spits are very important areas for birds, seals, and other wildlife. Within the national seashore there are more than 40 miles of prime breeding, feeding, and sheltering habitat for nesting migrating and staging shorebirds including state and federally listed species. • The barrier beaches at Nauset Beach in Orleans and Chatham and Coast Guard Beach in Eastham undergo multidecadal cycles of elongation and subsequent ocean breaching. Changes in the geomorphology of this barrier beach system influence sediment dynamics and tidal ranges within Pleasant Bay and Nauset Marsh estuaries. • Erosion of coastal bluffs north of Nauset Light Beach in Eastham is a natural process but is being influenced by changes in sea level rise. Erosion rates are highest in the area just north of Nauset Light Beach and decrease in a northward direction. Along the oceanside, the erosion rate has been 2.5–3 feet per year over a 100-year period. • Coastal bluffs and parabolic dunes in the Province Lands are migrating at average rates of 1–4 meters per year. • Many of the national seashore’s coastal areas are vulnerable to sea level rise and increased intensity and frequency of storms predicted to come with climate change. Development and recreational uses atop coastal bluffs and dunes can increase vulnerability and limit natural adaptation of dunes and vegetation. <p>Trends</p> <ul style="list-style-type: none"> • Although some areas of the Cape are eroding, others are accreting, including the Province Lands Hook and Monomoy Spit. Still other areas, such as Nauset Spit, follow a cycle of spit growth and inlet formation. Natural changes in inlet structure and location contribute to reshaping the back-barrier salt marshes and estuaries. • Natural coastal processes, including hurricanes and northeasterly storms (nor’easters), which created and continue to reshape the coastal landforms of the Cape, are also responsible for coastal changes caused by flooding and erosion. • The national seashore provides important habitat for three federally listed shorebird species. The federally endangered roseate tern and federally threatened red knot use beaches and mudflats to rest and feed during their long migration, and federally threatened piping plovers breed, feed, and rest on bay and ocean beaches throughout the seashore. Piping plovers that nest north of Cape Cod migrate through the national seashore in the spring and fall to rest and feed. • Although the numbers of nesting pairs of piping plover have been relatively stable during the past decade, their productivity has been declining. The numbers and productivity of nesting terns and American oystercatchers have declined markedly. Unnatural levels of predators feeding on shorebird nests and chicks are the main reason for this decline.

Fundamental Resource or Value	Natural Resources: Beaches, Barrier Islands, and Spits
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Erosion of coastal bluffs that extend north of Nauset Beach in Orleans to Provincetown is a natural process that is being influenced by changes in sea level. • Although more intact than most coastal areas, the beaches and upland ecosystems of outer Cape Cod no longer represent fully natural conditions or processes. They have been altered by more than 350 years of human activity, and the numbers of people, pets, vehicles, and predators present on beaches are a reflection of these alterations. • Development and recreational uses can increase vulnerability and limit adaptation of plant and wildlife systems. • Climate change is evident in sea level rise. • Historical tide gauge data from the Nantucket Island tide gauge show that sea level around the national seashore is rising at a faster rate than the national average. • Although Cape Cod has not been exposed to hurricane-strength storms during the last century, severe northeasterly storms do occur, and storms are expected to intensify over the next century. At least one Saffir-Simpson category 1 hurricane should be expected to travel up to Cape Cod by 2100. Annual precipitation is projected to increase by 9%–13% this century, and extreme precipitation is projected to increase by 200%–500%. • Increases in sea level may lead to loss of land and critical habitat, not only on beaches and barrier islands but also in the back-barrier systems that they protect, thus reducing the overall resiliency of these systems. Increased erosion and/or accretion across the coastline by storms, coupled with shorelines adjusting to new mean sea levels and increased risk of high intensity and more frequent storm events with high waves and storm surges, will reshape these resource areas. • Off-road vehicle use is a relatively long-standing activity that requires constant monitoring to ensure that it does not threaten natural resources and shoreline plant and animal species. Inappropriate off-road use can destroy embryonic dunes and prevent seaward accretion of the beach and negatively impact wildlife. <p>Opportunities</p> <ul style="list-style-type: none"> • The National Park Service has demonstrated experience with allowing natural shoreline processes to take place unimpeded, while also managing and reducing human-caused disturbances to wildlife. • This management requires long-term monitoring and research and communication. • First-hand research, observation, and monitoring must continue to predict shoreline change and advise on re-siting and protecting vulnerable facilities. • Educational opportunities are plentiful regarding values of beach and related resources, natural processes, sea level rise, climate change, and plants and wildlife including federally and state protected species. • Natural resource data collected by the national seashore should be retrievable and usable in perpetuity.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Visitors • Six Outer Cape towns (municipal governments) • Local residents • Massachusetts Coastal Zone Management • Cape Cod Commission • U.S. Army Corps of Engineers • Center for Coastal Studies • Improved property owners • Massachusetts Beach Buggy Association • Massachusetts Natural Heritage & Endangered Species Program • Monomoy National Wildlife Refuge • Massachusetts Audubon Wellfleet Bay Sanctuary

Fundamental Resource or Value	Natural Resources: Beaches, Barrier Islands, and Spits
Data and/or GIS Needs	<ul style="list-style-type: none"> • Shoreline vulnerability assessment. • Mapping and monitoring shorebird feeding and nesting and roosting/staging habitats and substrate type. • Baseline inventory and habitat use of tiger beetles on Chatham beaches.
Planning Needs	<ul style="list-style-type: none"> • Climate change adaptation plan / strategic plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Coastal Barrier Improvement Act of 1990 • Coastal Zone Management Act of 1972 • National Environmental Policy Act of 1969 • Rivers and Harbors Appropriations Act of 1899 • Executive Order 11988, "Floodplain Management" • Executive Order 13642, "Making Open and Machine Readable the New Default for Government Information" • Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 4) "Natural Resource Management" • Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook • Director's Order 77: Natural Resource Protection • NPS Procedural Manual 77-2: Floodplain Management



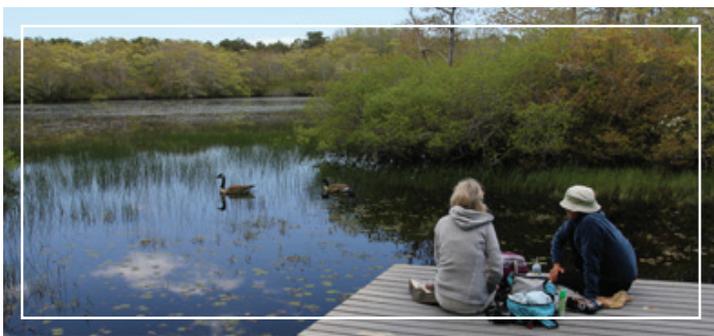


Fundamental Resource or Value	Natural Resources: Estuaries and Salt Marshes
Related Significance Statements	Significance statements 2, 3, 4, 6, and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • In all Cape Cod National Seashore salt marshes there is evidence of sea level rise with wetland submergence, changes in species, and increasing creek and pool size, indicating the marshes are getting wetter. • The Herring River in Wellfleet has been disturbed through diking and drainage for a century. Among the numerous impacts of these alterations have been the diminished ability of the river to serve as the corridor for diadromous fish such as river herring (alewife, blue-backed herring) and American eel as they migrate to the Herring Pond kettle pond complex for spawning, nursery, and adult habitat. Regional populations of these fish species have declined largely due to riverine alterations impeding their migrations. • Of the eight major marsh and estuarine systems within the seashore, only one—Hatches Harbor, in the northwest corner of Provincetown—is entirely on NPS property, and even it has a regional airport in its midst. The ownership and jurisdiction of the other systems are mixed with local municipalities and state-owned submerged lands. • Some salt marshes, such as the Gut (Wellfleet), Middle Meadow (Wellfleet) and Jeremy marsh (Wellfleet), are suffering from Sesarma-crab herbivory-related losses of salt marsh vegetation that has impacted species composition and erosion. • Estuarine Intertidal – Saline/Brackish Flats have been designated as vulnerable, high-value natural communities. They are critical roosting and, because of their high abundance of marine invertebrates, feeding areas for many species of waterbirds. The flats are also used as foraging habitat by many land mammals, including fox, coyote, and raccoon.

Fundamental Resource or Value	Natural Resources: Estuaries and Salt Marshes
<p>Current Conditions and Trends</p>	<p>Conditions (continued)</p> <ul style="list-style-type: none"> • Estuaries – These brackish water tidal systems bridge the interface between land and sea with near freshwaters at the head of the estuary and fully saline ocean waters at the mouth. Estuaries are known for their high algal and seagrass productivity, which support many marine invertebrates and fish, including many species of economic importance to regional fisheries, including oysters, quahogs, razor clams, striped bass, and flounder. In addition to their role as critical habitat, estuaries also play an important role in coastal protection by absorbing storm energy and surge and intercepting land-derived nutrients and pollutants. • The Herring River Estuary in Wellfleet and Truro was an unrestricted tidal marsh until 1909 when a dike was constructed across the mouth of the river, which was rebuilt in the 1970s. About 1,100 acres at the Herring River have a restricted tidal regime, which has created marsh decomposition and acidification, ecosystem health degradation, public health concerns due to fecal coliform bacteria, and low dissolved oxygen stressing aquatic life and leading to periodic fish kills. • With the end of bounty hunting and other legal protections that occurred in the early 1970s, regional seal populations have recovered, and there is a large and growing seal population in the national seashore. Seals are large predators that feed on fish and invertebrates, and their population recovery will likely shift estuarine food webs from the conditions that existed during their mid-20th century absence. <p>Trends</p> <ul style="list-style-type: none"> • Half the marshes on the Outer Cape have experienced vegetation loss of more than 30% over the past century due to development. • Certain marshes have lost significant amounts of vegetation due to nonnative crab grazing. • Marsh vegetation composition is changing rapidly in response to sea level rise. • Elevation changes in three of the eight marshes have been highly variable over the last 15 years. • Monitoring has shown that marshes that are low in the intertidal zone and near the bottom of the growth range may be more vulnerable than those marsh platforms that are higher in the intertidal zone. • Monitoring has shown the estuaries to be in a degraded condition, particularly in the upper reaches and coastal ponds with limited tidal flushing. The poor water quality is the result of high inputs of nutrients from land and associated eutrophication with algal blooms, seagrass declines, and poor habitat quality, though some well-flushed areas at lower reaches show signs of improvement. • Eelgrass monitoring in Pleasant Bay reveals increases in eelgrass distribution, facilitated by an improvement in water clarity following formation of the North Beach inlet in April 2007 and the associated increase in tidal flushing. • After being extirpated from East Harbor following massive macro-algal blooms in 2006 and 2007, seagrass (eelgrass and widgeon grass) has recently re-colonized the system. Seagrass patches dominated by eelgrass were first observed in East Harbor in April 2013 and currently occupy more than 10 acres of the lagoon. • Patterns of seagrass characteristics and dynamics to date have been correlated primarily with physical disturbance at Pleasant Bay monitoring sites, improvement of water clarity in Pleasant Bay (barrier beach inlet formation) and East Harbor (tidal restoration), and the occurrence of viable seed source to East Harbor. • Harmful algal blooms of the red tide causing toxic dinoflagellate are widespread in Nauset Marsh estuary, particularly its coastal ponds. Algal proliferation in the spring has led to shellfishing closures in 21 of 23 years from 1992 to 2014.

Fundamental Resource or Value	Natural Resources: Estuaries and Salt Marshes
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Climate change / sea level change and increasing storm surge vulnerability at Cape Cod National Seashore could result in: <ul style="list-style-type: none"> • Loss of land, marsh, and critical habitat • Increased erosion and/or accretion across the coastline by storms coupled with shorelines adjusting to new mean sea levels • Rising groundwater tables and possible salt water intrusion due to rising sea levels • Excess nutrient loading and pollution issues caused by septic leachate, road runoff, and lawn fertilizer threaten estuarine waters and lead to algal blooms, oxygen depletion, seagrass die-offs, and fish/shellfish kills. Also, the introduction of pharmaceuticals and endocrine disruptors to national seashore and nearby waters has been shown, and significant levels have been measured in Cape Cod Bay. • Certain marshes within Cape Cod National Seashore are losing significant amounts of vegetation due to nonnative <i>Sesarma</i> crab overgrazing, known as saltmarsh die-off. • Human activity in water both directly and indirectly impacts shoreline plants, wildlife, and access points. • The effects of aquaculture and cultching on marine resources are relatively unknown but need to be monitored and studied to protect those resources. For example, preliminary research shows degraded bottom habitat below aquaculture sites. • Harmful algal blooms, such as red tides, can proliferate in estuaries and coastal ponds in which there is relatively little tidal flushing and high nutrient levels. • Reduced freshwater discharge to coastal marshes through groundwater withdrawal could increase salinity of nearby estuaries. • Increased numbers of nonnative species are negatively affecting salt marsh grasses in tidally restricted systems like the Herring River. Warming temperatures are leading to species range shifts and might be having consequences on ecosystem structure with changes in predator abundances (e.g., blue crabs) in salt marsh and estuarine systems. • The Herring River will remain in degraded condition unless tidal flushing is increased to improve sediment transport and water quality. • The potential for oil spills to reach the seashore is high. Large tankers, freighters, fishing boats, and recreational vessels frequent the Gulf of Maine (which includes both Massachusetts and Cape Cod Bays); a major shipping lane is 6 miles offshore; intensive commercial fishing takes place just 10 miles to the north; and major ports are just across Cape Cod Bay. <p>Opportunities</p> <ul style="list-style-type: none"> • Efforts are being made to restore the natural hydrography and ecology of estuaries in consultation with affected communities. • Large-scale restoration of tide-restricted systems has begun at two sites: Hatches Harbor and East Harbor Lagoon. • There are also plans to restore tidal flow to the Herring River system, which would greatly improve water quality and create estuarine and salt marsh habitat for numerous coastal species, including shellfish, shorebirds, and fish. • Partnerships are resulting in large-scale restoration of tide-restricted systems at Hatches Harbor and East Harbor Lagoon and the planned restoration of tidal flow to the Herring River system. A more natural tidal regime in the Herring River is predicted to improve conditions for shellfish growing and historic ecological function. • Work with local communities to address tidal obstructions should continue. • Research and monitoring efforts include estuarine nutrient enrichment and sea grasses, sediment erosion tables, salt marsh elevation, nekton, vegetation, and birds. • Seashore staff should participate and provide an advisory role in regional nutrient management planning for fertilizers, wastewater, and stormwater.

Fundamental Resource or Value	Natural Resources: Estuaries and Salt Marshes
Stakeholders	<ul style="list-style-type: none"> • Cape Cod Commission • Friends of Herring River • Visitors • Residents • Outer Cape towns • Section 208 Cape Wide Water Quality Plan Update stakeholders • Massachusetts Coastal Zone Management • U.S. Army Corps of Engineers • Massachusetts Audubon Wellfleet Bay Sanctuary • Center for Coastal Studies • Massachusetts Division of Marine Fisheries • Massachusetts Department of Environmental Protection • Fishermen associations
Data and/or GIS Needs	<ul style="list-style-type: none"> • Research on wetlands response to climate change and sea level rise. • Monitor nutrient loading from land use as transported by groundwater into estuaries and saltmarshes to better understand impacts on water quality and ecosystems. • Document and study species invasions. • Research on the influence of crab-herbivory and bioturbation on salt marshes experiencing dieback. • Mapping and monitoring shorebird feeding and nesting and roosting/staging habitats and substrate type. • Map and monitor seagrasses. • Evaluate the potential impacts of estuarine aquaculture and oyster reef restoration on water quality, habitat, and ecosystems. • Continued pre- and post-tidal restoration project ecological monitoring and hydrology modeling studies.
Planning Needs	<ul style="list-style-type: none"> • None identified.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Water Act of 1972 • Executive Order 11990, "Protection of Wetlands" • Executive Order 13158, "Marine Protected Areas" • Executive Order 13547, "Stewardship of the Ocean, Our Coasts, and the Great Lakes" • Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 4) "Natural Resource Management" • Director's Order 12: <i>Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • Director's Order 77: <i>Natural Resource Protection</i> • NPS <i>Procedural Manual 77-2: Floodplain Management</i>



Fundamental Resource or Value	Natural Resources: Freshwater Ponds, Wetlands, and Aquifer
Related Significance Statements	Significance statements 1, 3, 6, and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> Numerous dune ponds and seasonally flooded dune slack wetlands in the national seashore play a critical role in supporting rare plants and specialist species such as spadefoot toads and a host of insect species. The Pamet River and many of the national seashore’s permanent kettle ponds have been identified by the Massachusetts Living Waters Program as critical habitats. The 20 permanent kettle ponds within the seashore are outstanding natural and recreational resources. Kettle ponds have been recognized by the Massachusetts Natural Heritage program for their unique plant communities and species diversity. Vernal wetlands may be the most sensitive of freshwater bodies to water table drawdown, but responses to changing groundwater levels have not yet been modeled. Vernal ponds support many wildlife species, such as spotted salamanders, that do not use large, permanent ponds. During the past seven decades, parabolic dunes in Province Lands have migrated at average rates of 1–4 meters per year. The approximately 350 wetlands within this system of parabolic dunes provide critically important habitat for many species. Both the Atlantic white cedar swamp and the coastal plain pond shore have been designated by the state as imperiled high-value natural communities. The Atlantic white cedar swamp is restricted to wet areas, and conditions for seed germination (open peat and sunlight) are no longer common on Cape Cod due to ecological succession. As a result, the Atlantic white cedar swamp near the Marconi site in South Wellfleet, a young stand in the Province Lands, and two stands in Eastham are the only areas of this community in the national seashore. The red maple / tupelo swamp is more common. Red maple is primarily a wetland species but is occasionally found in terrestrial habitats. Many of the seashore’s red maple swamps have been ditched and drained, which has changed their hydrology and degraded their integrity and value as wetlands. The reduced hydro-period of ditched and drained red maple swamps decreases their value as habitat for aquatic wildlife (e.g., amphibians and reptiles) and promotes change from wetland to upland vegetation. Vegetation assemblages of the forested wetlands are relatively pristine and there is a low incidence of nonnative species. Both within and outside the national seashore, small (<0.6 acres) wetland change has occurred at a few sites, typically associated with commercial or residential development. The diverse freshwater wetlands of the seashore provide habitat for more than 80 species of odonates (dragonflies and damselflies), including several rare species. All surface waters in and adjacent to the seashore are designated national resource waters (the highest state protection category) and, thus, must meet minimum water quality standards. This designation also prohibits the discharge of any new pollutants.

Fundamental Resource or Value	Natural Resources: Freshwater Ponds, Wetlands, and Aquifer
<p>Current Conditions and Trends</p>	<p>Trends</p> <ul style="list-style-type: none"> • Trend analysis of monitoring data suggests a large increase in alkalinity— coincident with a large decrease in acidity (increase in pH)—in the national seashore’s ponds, which may influence a wide variety of biogeochemical processes. • In almost all ponds pH levels have increased due to a reduction in acid rain during the last several decades related to improvements in air quality (NO_x and SO₄ pollution) associated with Clean Air Act regulations. • Increasing pond water temperatures during the last several decades are closely related to warmer air temperatures linked to climate change. • Concentrations of mercury in fish fillets from the ponds typically exceed human health consumption thresholds. Accordingly, specific fish consumption advisories have been issued for 12 freshwater ponds, and for the remaining 8 ponds no consumption is advised for children and for women of child-bearing age. Whole-body fish concentrations of mercury sampled in the 1990s in the national seashore were generally greater than levels proposed to be protective of fish-eating wildlife. • Monitoring data indicate declining water clarity in several ponds, the primary cause of which is not known. Nutrient concentrations and phytoplankton biomass in the ponds are relatively low. • Pond surface water levels have remained constant during the last decade with slight seasonal variations. Pond water levels are closely tied to regional weather patterns, particularly to wetter and drier periods and a drought index. • Hydrologic monitoring indicates that groundwater levels vary seasonally and are directly related to precipitation amounts.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Climate change / sea level change and storm surge could result in <ul style="list-style-type: none"> • Rising groundwater tables and possible salt water intrusion • Loss of nearshore freshwater ecosystems • Warming water impacts on pond chemistry and biology • Increased storm intensity and frequency will probably increase erosion of shorelines and suspension of sediments in pond waters. • Sea level rise is predicted to result in a thinning of the Pamet and other groundwater lenses. • Increased development could further increase groundwater nitrogen levels, which in turn would contribute to nutrient enrichment of surface waters. Groundwater is primarily threatened by contamination from nutrients (wastewater, landfills) and by saltwater intrusion. Atmospheric nitrogen deposition is also a source of excess nutrients in surface waters. • Additional development adjacent to resource areas could lead to heavier resource and infrastructure use (e.g., roads, groundwater, pollutants, recreation). • Erosion of pond shorelines carries sediment into the ponds, reducing water clarity, and efforts to mitigate disturbance of shoreline vegetation and to manage recreational use are critical. • Phragmites and purple loosestrife are commonly observed nonnative invasive plants in the seashore’s dune slack wetlands and freshwater ponds.

Fundamental Resource or Value	Natural Resources: Freshwater Ponds, Wetlands, and Aquifer
<p>Threats and Opportunities</p>	<p>Opportunities</p> <ul style="list-style-type: none"> • Natural processes continue unimpeded except where appropriate to selectively manage for native biological diversity or rare, threatened, or endangered species or communities. • Amphibian monitoring provides data on trends in amphibian populations and communities that can provide insight into the quality and integrity of national seashore habitats. • Increased research and monitoring of red-maple swamps could better determine impacts of draining and potential for restoration. • The long-term monitoring of kettle pond water quality is one of the longest freshwater water quality data sets in the country. These data could be analyzed for trends and changes related to climate change and human uses. Efforts are underway to integrate hydrologic, air quality, kettle pond vegetation, and water quality monitoring data collected in the national seashore to better understand the impacts of climate change on kettle pond ecosystems. • Long-term hydrologic monitoring assists in managing the effects of municipal water supply use on ponds and groundwater wells. • Management of public access points to ponds and freshwater wetlands in collaboration with jurisdictional partners and within the seashore is critical for their protection and in maintaining water quality and ecosystem integrity. • Signage should be up to date and clearly posted at access points with interpretive, natural resource protection, and regulation information. • The national seashore’s water resource education programs include science outreach, science education, citizen science, and “Parks as Classrooms” and should continue to be supported. • The seashore’s participation in the Lower Cape Water Management Task Force and involvement with local pond stewardship groups (Gull Pond Area Conservation Association, Friends of Chatham Waterways, Orleans Ponds Coalition, Harwich Conservation Trust, Massachusetts Acid Rain Monitoring, and Ponds and Lakes Stewardship programs) should continue. • Restoration efforts may be warranted, such as widespread replanting and protection of eroded slopes, eradication of invasive nonnatives, and removal of red maples at Atlantic White Cedar Swamp. • Kettle pond water quality research and monitoring, kettle and vernal pond vegetation monitoring, amphibian monitoring, hydrologic monitoring, and air quality monitoring are essential to maintain the ecological health of these sensitive resource areas. • National seashore staff should continue to work closely with seashore town and local organizational partners on restoration projects and stewardship opportunities. • National seashore managers and staff should continue to engage communities and private property owners to promote stewardship and convey information on pond conditions.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Wellfleet Conservation Commission • Wellfleet Natural Resources Advisory Board • Truro Conservation Commission • Section 208 regional nutrient management stakeholders • Massachusetts Department of Environmental Protection • Cape Cod Commission

Fundamental Resource or Value	Natural Resources: Freshwater Ponds, Wetlands, and Aquifer
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Monitor and evaluate water quantity and quality and their relationship to climate change. • Monitor human impacts on freshwater ponds. • Monitor nutrient loading from land use as transported by groundwater into freshwater. • Continue to monitor atmospheric deposition as a source of excess nutrients. • Evaluate impacts of historic ditching and red maple swamp hydrology and trends in plant species composition. • Evaluate restoration of red maple swamp hydrology by removing (filling in) drainage ditches.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Ponds management plan. • Climate change adaptation plan / strategic plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Water Act of 1972 • Executive Order 11990, "Protection of Wetlands" • Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 4) "Natural Resource Management" • Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook • Director's Order 77: Natural Resource Protection • NPS Procedural Manual 77-2: Floodplain Management



Fundamental Resource or Value	Natural Resources: Nearshore Marine Resources
Related Significance Statements	Significance statements 1, 2, 3, 4, and 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Large parts of Pleasant Bay and Wellfleet Bay are within state-designated areas of critical environmental concern. • Marine mammals, including whales, dolphins, porpoises, and seals, are present throughout Cape Cod waters. All marine mammals are protected under the Marine Mammal Protection Act, which prohibits approaching, handling, and taking of marine mammals. A portion of Cape Cod Bay within the national seashore is designated as critical habitat for the northern right whale. • Cape Cod nearshore waters, and the fish and marine invertebrates they contain, are important foraging habitats for numerous species of waterbirds (e.g., terns, gulls, ducks, grebes, loons, gannets, cormorants) and for marine mammals that breed, migrate through, or overwinter here. Bottom habitats in nearshore waters are also highly productive with extensive seagrass beds, mussel beds, algal canopies, and various nonliving substrates that support diverse invertebrate and fish communities. • Cape Cod waters provide habitat for several commercially important shellfish species. Shellfish aquaculture is practiced in waters inside and adjacent to the seashore. Some species (e.g., quahog and bay scallop) have experienced local harvest declines, whereas others (e.g., razor clam and soft shell clam) have experienced local increases. • Nearshore waters support a diverse food web with abundant fish populations. Many species, including striped bass and flounder, are important recreationally and commercially. White sharks, which spend the summer and fall in Cape Cod waters, are another important fish. These fish can play an important trophic role, as well as affect public safety considerations. <p>Trends</p> <ul style="list-style-type: none"> • Eelgrass beds on the Cape decreased by about 30% between 1995 and 2001. Nutrient enrichment is thought to be one of the primary factors causing declines in eelgrass populations at both regional and global levels. Results of monitoring from 2003 to 2014 reveal both spatial and temporal changes in Cape Cod Bay eelgrass populations in response to physical wave disturbance. • Results of monitoring in Pleasant Bay reveal increases in eelgrass distribution, facilitated by improved water clarity following formation of the North Beach inlet in April 2007 and the associated increase in tidal flushing. • After being extirpated from East Harbor following massive macro-algal blooms in 2006 and 2007, seagrass (eelgrass and widgeon grass) has recently recolonized the system. Seagrass patches dominated by eelgrass were first observed in East Harbor in April 2013 and currently occupy more than 10 acres of the lagoon. • Patterns of seagrass characteristics and dynamics to date are correlated primarily with physical disturbance at Cape Cod Bay and Pleasant Bay monitoring sites, improvement of water clarity in Pleasant Bay and East Harbor, and the occurrence of viable seed source at East Harbor. • The apparent increase in the great white shark population near shore is probably due to seal population recovery. Seals are large predators that feed on fish and invertebrates, and their return will probably shift estuarine food webs from conditions during their mid-20th century absence.

Fundamental Resource or Value	Natural Resources: Nearshore Marine Resources
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Climate change impacts such as warming waters alter the abundance and distribution of marine organisms. Increasing frequency and intensity of storms can increase precipitation, runoff, and wave activity, all of which reduce water clarity and affect water quality. • Sea level change and storm surge vulnerability could result in increasing sea levels and the loss of land and critical habitat. In addition to direct habitat loss to erosion, the relocation of infrastructure from shoreline to inland locations could result in habitat loss. • The addition of nutrients to coastal waters from runoff and atmospheric deposition can lead to declines in water quality and alter structure and function of marine plant and animal communities. • Sea level rise, increased storm intensity, and altered ocean chemistry will have major impacts. • Decreased pH and other changes in ocean chemistry may reduce shellfish production and the growth of many marine invertebrate species. • Endocrine disruptors from pharmaceuticals are being introduced to Cape Cod’s waters, and significant levels have been measured in Cape Cod Bay. These compounds originate in wastewater and are distributed to coastal waters through septic leachates or wastewater treatment plant discharge. • “Ghost fishing gear” (discarded, lost or abandoned fishing gear such as lobster pots) and some fishing methods (e.g., dragging) are a hazard to marine life, and numerous entanglements and wildlife deaths have been attributed to this gear. • Scallop dragging, hydraulic dredging, and other mechanical activities, including boat propellers, that disturb the sediment can alter benthic habitats and lead to habitat loss as well as the direct killing of marine invertebrates and plants. • Eelgrass die-off as a result of nutrient and sand bottom disturbing activities is of great concern because eelgrass is critical habitat for marine species, including many of economic concern (e.g., bay scallops). • Harmful algal blooms such as red tides can proliferate in coastal waters and occur almost annually in Gulf of Maine waters and often extend into Cape Cod Bay. • The plastic debris deposited on ocean beaches is only a small fraction of what pollutes nearshore waters. This debris threatens the health of wildlife and water quality. <p>Opportunities</p> <ul style="list-style-type: none"> • Cape Cod National Seashore continues to participate in ocean management planning with the Cape Cod Commission and the Commonwealth’s Coastal Zone Management program. • Cape Cod National Seashore could offer educational information and programming on coastal food webs and the diversity of fish and shellfish in its waters. • Citizen volunteers could assist with eelgrass assessments and other research and monitoring efforts and habitat restoration projects. Leveraging new opportunities for collaboration and cooperation with partners could provide important information on nearshore resources. • Much of the work taking place within the national seashore is in coastal embayments, marshes, and uplands. Research and monitoring, including water quality, benthic habitat mapping and surveys, understanding the impact of white sharks and large seal populations, and eelgrass trends could provide important information on nearshore resources. • Nutrient management, as part of the regional effort, as well as understanding the fate of land-derived nutrients in nearshore waters and the role of flora and fauna in mitigating and facilitating that cycle could improve resource conditions. • Collaboration with regional partners such as the Center for Coastal Studies on marine mammal, coastal geology, and coastal water quality issues, as well as marine debris and micro-plastics (emerging contaminants) issues, could improve resource conditions.

Fundamental Resource or Value	Natural Resources: Nearshore Marine Resources
Stakeholders	<ul style="list-style-type: none"> • Wellfleet Conservation Commission • Wellfleet Natural Resources Advisory Board • Truro Conservation Commission • U.S. Army Corps of Engineers • Center for Coastal Studies • Woods Hole Oceanographic Institute • National Oceanic and Atmospheric Administration • Massachusetts Division of Marine Fisheries • Massachusetts Department of Environmental Protection • Fishermen associations
Data and/or GIS Needs	<ul style="list-style-type: none"> • Water-quality assessment. • Detailed bathymetry and geological mapping of seafloor and benthic habitat. • Nearshore invertebrate survey. • Research on seal population on the Outer Cape, including diet, feeding, bacteria, sharks and trophic cascades.
Planning Needs	<ul style="list-style-type: none"> • Climate change adaption plan / strategic plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Water Act of 1972 • Marine Mammal Protection Act • Executive Order 11990, "Protection of Wetlands" • Executive Order 13158, "Marine Protected Areas" • Executive Order 13547, "Stewardship of the Ocean, Our Coasts, and the Great Lakes" • Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 4) "Natural Resource Management" • Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook • Director's Order 77: Natural Resource Protection • NPS Procedural Manual 77-2: Floodplain Management



Fundamental Resource or Value	Natural Resources: Coastal Uplands
Related Significance Statements	Significance statements 3, 6, and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> All of the national seashore’s upland areas are within two state-designated critical habitat areas, estimated or priority habitat. As forest succession continues, the forested areas of the seashore and the size and age of trees in the forests are increasing. The forested areas are dominated by a mixed pine-oak forest, with lesser amounts of pitch pine forest and black and white oak forest. Smaller areas are dominated by black locust (nonnative), black cherry, red maple, white cedar, and red cedar. Natural processes typically create and maintain coastal grasslands and heathlands (e.g., Fort Hill, Marconi Area, Bound Brook, Bearberry Hill, Province Lands dunes), particularly along the coastal strip. Heathlands and grasslands are becoming forested because of succession (tree growth) facilitated in part by fire suppression. By 1985, only 271 hectares of heathland remained at Cape Cod National Seashore, a 63% decrease from 1962. Only one-third of the grasslands and heathlands present at the time of national seashore establishment in 1961 remained in 2000. This decline is cause for concern, not only for maintaining native species biodiversity, but also from the perspective of cultural resource and historic viewshed preservation. The maritime dune community is designated by the state as an imperiled high-value natural community and the sand plain heathland as critically imperiled. Large unfragmented tracts of coastal uplands offer opportunities to experience remoteness and solitude. <p>Trends</p> <ul style="list-style-type: none"> In the national seashore’s coastal uplands the amount of forest is increasing and the amount of heathland is decreasing, with commensurate changes to the abundance and diversity of wildlife associated each habitat type. Long-absent forest-dependent wildlife species, such as sharp-shinned hawk and fisher, are recolonizing southern New England as forests mature and are returning to the outer Cape, but grassland-heathland species are declining. For example, grasshopper sparrows no longer nest at Fort Hill, and vesper sparrows, a state-threatened species for which the seashore was a significant site, declined from 34 singing males recorded at four sites in the mid-1990s to 17 recorded at two sites in 2000. At the forest stand level, the size and age of trees are increasing and the amount of oak relative to pine is increasing. Within grassland/heathland habitats, tree cover as pitch pine is increasing and scrub oak has proliferated. These changes are the result of changes in human activities. Until the 20th century, livestock grazing, agriculture, and fire suppressed tree growth; however, by the mid to late 20th century these activities had substantially decreased. Grazing and other forms of agriculture are no longer practiced on the Outer Cape, and natural and human-caused fires have been suppressed. At Fort Hill and in the Marconi heathlands, prescribed fire, mowing, and cutting are being used to restore and manage grassland/heathland habitat.

Fundamental Resource or Value	Natural Resources: Coastal Uplands
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Erosion of coastal bluffs is eliminating coastal uplands. During the last 100 years the Atlantic coastal bluffs have experienced an average erosion rate of 2.5–3 feet per year. In recent years some areas have lost 15 feet or more in one year. • Heathland area is being lost due to bluff erosion, tree growth, nonnative species invasion, and loss of species already at their southern limit. • Known nonnative invasive species (e.g., black locust, gypsy moth, and winter moth infestations) and nonnative invasive forest pests (e.g., pine shoot beetle, white pine blister rust) pose a threat to the seashore’s forests. • Changes in the hydrologic regime in aquifers (e.g., water drawdown, water quality) threaten upland resources. • Projected warming, total precipitation, and extreme precipitation events threaten coastal uplands. • The harmful effects of nutrient enrichment and acidification from deposition of excess nitrogen and sulfur atmospheric pollutants put coastal uplands at risk. Nitrogen deposition levels are above critical loads for lichen and forest vegetation. Excess nitrogen can help invasive plant species grow faster and out-compete native vegetation adapted to lower nitrogen conditions. Red spruce trees are especially sensitive to acidification. • The phenology of flowering plants in New England is advancing as a result of climate change. Phenological mismatches with interacting species such as herbivores and pollinators can alter plant and animal communities. • Increasing development of lands outside of the national seashore that would result in habitat fragmentation and loss is of significant concern because, in many cases, these lands are ecologically connected to natural resources within the national seashore. • Fragmentation of large tracts of coastal uplands inside the national seashore by facility and infrastructure development is also a threat, given the extent of non-NPS lands inside the seashore and demands for recreational access. • Excessive social trails in dunes and dirt and mountain bikes in forests threaten vegetation. • Public and private uses of pesticides and other chemicals within and adjacent to the national seashore can adversely affect native species and water quality. Land use and development within the national seashore’s watershed can affect aquatic and coastal environments within uplands. • Fire suppression has contributed to successional process changes due to a loss of natural fire regimes and the creation and maintenance of open habitat. • Heathland and grassland communities that currently support a wide diversity of plants and animals, including many rare species (e.g., bushy rockrose, vesper sparrow), are increasingly endangered. <p>Opportunities</p> <ul style="list-style-type: none"> • Prescribed fire and mowing/cutting could be used to restore and maintain early successional stage habitats. • Large unfragmented habitat patches and revegetation areas could be identified and affirmatively protected. • Interpretive programs could focus on the importance of coastal uplands for plants and wildlife. • Partnerships and volunteerism are essential to the fire management program and research on coastal upland species and grassland restoration. • Long-standing research and monitoring efforts contribute essential knowledge regarding wildland fire regimes, forest succession, and heathland restoration. • Phenology citizen science programs are important. • Engaging communities/property owners in best management practices is an opportunity worth additional effort.

Fundamental Resource or Value	Natural Resources: Coastal Uplands
Stakeholders	<ul style="list-style-type: none"> • Massachusetts Division of Fish and Wildlife • Massachusetts Natural Heritage Program • Massachusetts Audubon Society • Towns with municipal drinking water wells inside Cape Cod National Seashore
Data and/or GIS Needs	<ul style="list-style-type: none"> • Update quantitative analysis of long-term trends in heathland and grassland habitats. • Update floral inventory, particularly of rare species. • Update inventory and assessment of invasive plant impacts and management needs. • Monitor inter moth / gypsy moth population dynamics and their effects on forest dynamics and succession.
Planning Needs	<ul style="list-style-type: none"> • Heathland and grassland habitats management plan. • Climate change adaption plan / strategic plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Air Act of 1977 • Coastal Zone Management Act of 1966 • Endangered Species Act of 1973 • Migratory Bird Treaty Act of 1918 • National Environmental Policy Act of 1969 • Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 4) "Natural Resource Management" • Director's Order 12: <i>Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • Director's Order 77: <i>Natural Resource Protection</i> • NPS <i>Procedural Manual 77-2: Floodplain Management</i>

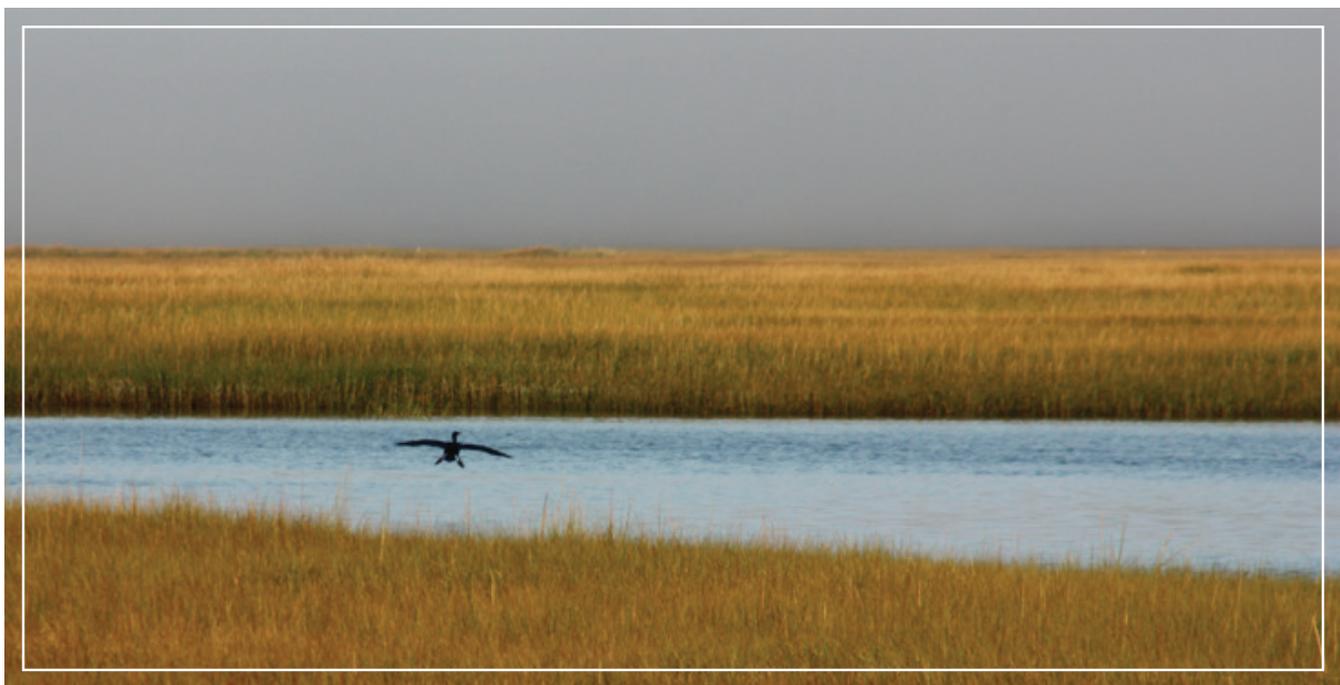


Fundamental Resource or Value	Natural Resources: Wildlife and Fish
Related Significance Statements	Significance statements 1, 3, 4, and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Thirty-one federally protected species (Endangered Species Act or Marine Mammals Protection Act) are present in the park. • The most prominent protected species is the threatened piping plover. The seashore is a significant site for this species; roughly 5% of the Atlantic Coast population and 14% of the Massachusetts population nests in the seashore. • About 75% or more of the northwest Atlantic Coast breeding population of the federally endangered roseate terns uses Cape Cod National Seashore beaches and mudflats during the post-breeding period (mid-July–October) for resting and feeding. • The red knot was federally listed as threatened in 2014, and the national seashore provides important staging and foraging areas for red knots, especially during their southbound migration from July to September. • The northern long-eared bat (<i>Myotis spetentrionalis</i>) is federally listed as threatened and has been observed in the park during the summer months. • Many other federally protected species are marine mammals. The seashore supports an additional 89 species that are listed by the Massachusetts Natural Heritage Program as endangered (11), threatened (14), special concern (22), or watch list (42). The seashore provides the most extensive landscape in the Northeast for eastern spadefoot toad (state threatened). • Although important for both ecological and biodiversity reasons, invertebrates have not received as much inventory effort as vertebrates and, in general, are poorly documented. The most well-known group is odonates (damselflies and dragonflies), of which more than 80 species have been recorded at the seashore, including several rare state-listed species. More than 400 species of lepidoptera (butterflies and moths) have been recorded at the seashore, including 12 listed by Massachusetts as threatened (3), special concern (7), and watch list (2). One federally listed invertebrate, the northeastern beach tiger beetle, occurs on South Beach, Chatham. • As the forests of Cape Cod and southern New England continue to mature, once extirpated native wildlife species associated with mature forests have recolonized the seashore. Recent arrivals include sharp-shinned hawk and fisher. • Inventory and monitoring data suggest that the seashore supports some of the region's most robust populations of Fowler's toad and spotted salamander. Their continued abundance here suggests that, from an amphibian perspective, the integrity of the seashore's terrestrial landscapes and freshwater wetlands remains relatively intact. • There is an active river herring run from Cape Cod Bay up the Herring River through the Gull Pond complex, where there is abundant spawning and nursery habitat. Regionally, river herring populations have declined primarily as a result of riverine hydrologic alterations and habitat degradation. • Nonnative terrestrial vertebrates are relatively few and generally have had minor negative impacts, except for the nonnative eastern cottontail rabbit, which has probably contributed to the decline of the native New England cottontail, and feral Canada geese, which impact rare aquatic plant species. • In many seashore kettle ponds, the introduced large-mouth bass is the top predator. Numerous nonnative marine invertebrates (e.g., green crab, common periwinkle) are long established in the seashore. • The Massachusetts Breeding Bird Atlas 2 from 2007 through 2011 confirmed 88 species as breeding in or adjacent to the seashore and an additional 17 probable and 10 possible.

Fundamental Resource or Value	Natural Resources: Wildlife and Fish
Current Conditions and Trends	<p>Trends</p> <ul style="list-style-type: none"> • For most species of seashore wildlife, little to no data are available to determine trends in abundance or distribution (occupancy). • Numbers of breeding pairs of piping plover have increased since the species was listed as federally threatened in 1986 and have been relatively stable in recent years. Their productivity is now in decline, however, and the seashore is no longer achieving the U.S. Fish and Wildlife Service recovery goal of a 5-year average annual productivity of 1.5 fledged chicks/pair/year. • In 2014, predation accounted for 70% of all failed piping plover nests. Productivity of other beach-dependent ground-nesting birds, (i.e., least tern and American oystercatcher) has also declined in recent years due, in most part, to intense predator pressure. • The extent and abundance of grassland-heathland bird species have declined both regionally and at the seashore as these open habitats succeed into forest in the absence of fire. • With the end of bounty hunting and enactment of the Marine Mammal Protection Act, local populations of seals have made a significant recovery. Seals are a major prey species for the great white shark, which has become more numerous. • Other historically present native species that have been restored or recolonized recently following a long period of human-caused absence include wild turkey, sharp-shinned hawk, otter, and fisher. • Numbers of spotted salamanders breeding in vernal ponds have increased since monitoring began in 2002. This increase appears to be related to higher reproductive success after a period of drought and suggests that environmental variation may be the most important determinant of amphibian population size at the seashore.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Development and habitat fragmentation both internal and external to the park causes concern. Buildout has created a sharply defined boundary between the park and adjacent residential and commercial development and reduced the amount and quality of wildlife habitat available for forest interior and/or disturbance-sensitive species. • Road kill affects many species. For long-lived box turtles and large snakes, with naturally high adult survival rates, the added mortality of road kill can have significant demographic impacts. Large numbers of amphibians are killed on rainy nights, especially on roads through or near ponds and wetlands. • Visitors, particularly those recreating on beach and salt marsh habitats, compete for space with native wildlife attempting to use those habitats for nesting, resting, and feeding. Providing opportunities for visitor use while minimizing its impacts on wildlife is a major component of the park’s management activities. • Increased annual temperature, annual precipitation, and frequency of extreme precipitation events, along with shifting plant and animal phenology, may cause decline or extirpation of some animal species. • Understanding human impacts on all wildlife, including nesting/staging and migrating birds, would help identify critical management actions needed to protect rare and listed species and reduce negative impacts. • Unnatural levels of predators pose threats to wildlife. Many populations of predators have increased due to their ability to take advantage of human-provided food (garbage, roadkill). • Unrestrained pets (dogs and cats) can chase and kill native wildlife. • Overwash and changes in beach morphology can have substantial impacts on shorebird species, causing direct loss of nests during breeding season and/or eliminating nesting habitat. Recent increases in the frequency and intensity of storms, probably attributable in part to continued sea-level rise and climate change, has exacerbated these effects. • Although the recovery of the park’s landscape to a mostly forested condition is positive for many species, the loss of open, early successional habitats such as grassland and heath threatens the population viability of many rare wildlife species that depend on these habitats. Prescribed fire and cutting/mowing are needed as substitutes for wildfires that once created and maintained open habitats.

Fundamental Resource or Value	Natural Resources: Wildlife and Fish
<p>Threats and Opportunities</p>	<p>Threats (continued)</p> <ul style="list-style-type: none"> • Increasing numbers of visitors in remote parts of the seashore make it harder for wildlife to avoid being displaced or disturbed. The park's regulations help reduce some impacts of recreational activities on wildlife. • Warming temperatures are resulting in northward expansion of southern species and southward expansion of northern species. New species are being observed at the seashore. For example, the blue crab, famously abundant in the Chesapeake Bay, was not found in Cape Cod waters until the early 2000s. During the last decade, the blue crab has colonized Cape Cod and moved into Cape Cod National Seashore. Blue crabs are significant predators in coastal environments and are poised to alter coastal invertebrate communities if they become sufficiently abundant. • White nose syndrome in bats is a fungal disease that affects hibernating bats and has caused major declines in once common species of native bats. The extent to which bat populations in the national seashore have been affected by this disease is uncertain. • Declining water quality in freshwater ponds, wetlands, estuaries, and coastal waters can negatively impact invertebrates and wildlife. • Wet mercury deposition levels are moderate and predicted levels of methylmercury in national seashore surface waters are very high. High mercury concentrations in birds, mammals, amphibians, and fish can result in reduced foraging efficiency, survival, and reproductive success. Assessment of in-park mercury levels in water, sediment, and dragonfly larvae samples is being conducted by a citizen science project. Results from 2013 indicate that sites with the highest dragonfly larvae mercury concentrations are in New England, including at Cape Cod National Seashore. • Concentrations of mercury in fish fillets from the park typically exceed human health consumption thresholds. Accordingly, specific fish consumption advisories have been issued for 12 freshwater ponds at Cape Cod National Seashore, and for the remaining 8 ponds no consumption is advised for children and for women of child-bearing age. Most whole-body fish concentrations of mercury sampled in the 1990s at the seashore were greater than levels proposed to be potentially lethal. <p>Opportunities</p> <ul style="list-style-type: none"> • On-site/off-site education, wildlife focused interpretive programs, science symposiums, media, and newspaper articles on wildlife topics. • Partnerships/volunteerism with resource management efforts including developing shorebird and seal Volunteers-in-Parks programs, citizen science, and engaging local towns and schools. • Ongoing long-term inventory and monitoring of national seashore wildlife. • Recovery of threatened, endangered, and special status species. • Promotion of "keeping common species common" through educational programs regarding species roles and the importance of protecting species before they become "rare and endangered." • Hunting is one of the oldest local traditional activities and outreach supports proper information of hunters.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Cooperative Ecosystem Study Unit— University of Rhode Island • U.S. Fish and Wildlife Service • Massachusetts Natural Heritage Endangered Species Program • Visitors • Birders • Massachusetts Audubon Society • Center for Coastal Studies

Fundamental Resource or Value	Natural Resources: Wildlife and Fish
Data and/or GIS Needs	<ul style="list-style-type: none"> • Assessment of community structure and food web changes in response to climate change. • Study of species occurrence and range shifts. • Studies of air pollution impacts on sensitive park ecosystems. • Plant and wildlife inventories. • In-depth study of species and species groups including predators such as coyote, fisher, red fox, crows, and bats.
Planning Needs	<ul style="list-style-type: none"> • Climate change adaption plan / strategic plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Marine Mammal Protection Act • Clean Air Act of 1977 • Coastal Zone Management Act of 1966 • Endangered Species Act of 1973 • Fish and Wildlife Coordination Act of 1956 • Migratory Bird Treaty Act of 1918 • Redwood Act of 1978, amending the NPS Organic Act of 1916 • Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds" • Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management" • Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 4) "Natural Resource Management" • Director's Order 12: <i>Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • Director's Order 77: <i>Natural Resource Protection</i>



Fundamental Resource or Value	Natural Resources: Night Sky, Soundscape, and Air Quality
Related Significance Statements	Significance statement 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Clear visibility, dark night sky, and natural quiet are desired conditions and most evident in winter. • Ozone concentrations are a significant concern. In the late 1990s, Cape Cod National Seashore ranked seventh of all national parks in daily maximum ozone concentration. In the mid-2000s only four other NPS units had average ozone concentrations higher than those at the seashore. Current ground-level ozone can reach levels that make breathing difficult for sensitive groups, but ozone levels are improving. The national seashore has many ozone-sensitive plants, but ozone exposure is rarely high enough to damage these plants. The U.S. Environmental Protection Agency lowered the National Ambient Air Quality Standards for ground-level ozone on October 1, 2015, and the national seashore and surrounding area may be declared in nonattainment for the new standard in the next few years, depending on where boundaries are determined by the state. • Deposition of wet nitrogen and sulfur pollutants warrants moderate concern based on NPS Air Resources Division benchmark deposition levels. National seashore ecosystems are rated as having moderate sensitivity to nutrient enrichment and high sensitivity to acidification effects from excess deposition of these pollutants. • Wet mercury deposition warrants significant concern based on NPS Air Resources Division benchmarks. Given that landscape factors influence the uptake of mercury in the ecosystem, mercury deposition status is based on the national seashore's moderate deposition level and very high predicted levels of methylmercury in surface waters. • Scenic conditions are sometimes obscured by pollution-caused haze, but visibility is improving. At night, air pollution scatters artificial light, increasing the effect of light pollution on the night sky. <p>Trends</p> <ul style="list-style-type: none"> • Atmospheric deposition is mostly influenced by off-Cape industry, prevailing winds, and seasonality. • Night sky friendly outdoor light fixtures are being installed to provide the right amount of light and sensitivity to wildlife issues and can be shielded. • Improved aerosol data collected annually from 2002 to 2013 indicate that ammonium sulfate in the atmosphere has had the greatest contribution to the diminution of visibility at Cape Cod National Seashore. Deposition of NO_x and SO₄ has declined over the last several decades, resulting in less acidic rain. • Air quality at the seashore is generally improving in response to regional emission reductions. Visibility, ozone, and wet sulfur deposition trends improved from 2004 to 2013, wet mercury deposition remained stable, and wet nitrogen deposition increased. Both wet nitrogen and sulfur deposition decreased over the last several decades, resulting in less acidic precipitation with a higher pH.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Artificial light from outside the seashore is not easily controlled and is increasing, particularly in commercial zones. • Artificial sound (human) is generally regulated only by town bylaws. • Aircraft and other motors must be considered as new uses are proposed, e.g., large-scale wind or airport activities. • Coal-fired power plants and vehicle exhaust are major contributors to air quality in the northeastern United States. Both sources have reduced emissions significantly in the past decade to reduce ozone and fine particles. Between 2000 and 2014, sulfur dioxide and nitrogen oxide emissions from electric utilities in Massachusetts were reduced by 96% and 89%, respectively. Other eastern states have accomplished similar reductions, and additional emission reductions from electric utilities in the eastern United States are required by 2018. Massachusetts and other northeastern states also are requiring cleaner fuel oil for utility and industrial facilities.

Fundamental Resource or Value	Natural Resources: Night Sky, Soundscape, and Air Quality
<p>Threats and Opportunities</p>	<p>Opportunities</p> <ul style="list-style-type: none"> • Creation and adoption of lighting guidelines, essential in creating good nighttime visibility, reducing the negative cumulative effect of artificial lighting, and preserving an enjoyable nocturnal environment. • Installing sensitive lighting / shielded lighting with each opportunity to replace outdoor lighting. • Use baseline information on night sky available from the NPS Night Skies Natural Sounds Division. • Long-term participation in the National Atmospheric Deposition Program National Trends Network and Mercury Deposition Network programs and monitoring of atmospheric deposition and precipitation and other meteorological parameters. • Educational opportunities regarding tour bus operations and idling buses and trucks, particularly due to the state 5-minute idling limit. • Integrated approach to night sky / soundscape, considering impacts and location-specific solutions. Air quality and kettle pond water quality monitoring could be integrated into this program. • Work cooperatively with other federal and state air quality agencies and local stakeholders to reduce air quality impacts in the national seashore from sources of air pollution. Partnering with nearby developers or planners could help increase awareness about the importance of national seashore air quality, scenic views, night sky, and natural sounds. • Continue to improve national seashore sustainability and environmental leadership on greenhouse gas emissions reductions through ongoing implementation and updating of the Climate Friendly Action Plan and Environmental Management System (Director’s Order 13A: <i>Environmental Management Systems</i>). • Expand interpretative and educational tools to communicate the connections between air quality, water quality, scenic views, night sky, natural resources, human health, climate change, and other associated resources.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Outer Cape communities • Cape Cod National Seashore Advisory Commission • Visitors, particularly from urban environments • NPS Night Sky Team • NPS Air Resources Division • U.S. Geological Survey Water Resources Division • National Atmospheric Deposition Program National Trends Network • National Atmospheric Deposition Program Mercury Deposition Network • University of California at Davis (air quality research) NPS Northeast Coastal and Barrier Network
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Deposition impact study of water resources such as freshwater kettle ponds. • Periodic night sky monitoring by NPS Night Sky Team.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Night skies / soundscapes plan. • Parkwide lighting plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Air Act of 1977 • National Parks Air Tour Management Act • National Parks Overflight Act of 1987 • “Audio disturbances” (36 CFR 2.12) <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 4) “Natural Resource Management” • Director’s Order 13A: <i>Environmental Management Systems</i> • Director’s Order 47: <i>Soundscape Preservation and Noise Management</i>

Fundamental Resource or Value	Cultural Resources: Truro Highlands Historic District
Related Significance Statements	Significance statements 6 and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • The Highland House is a repository and museum operated by Truro Historical Society, a nonprofit lessee. It has an Asset Priority Index (API) of 57 (API has a 1–100 scale, with 100 indicating the most valuable asset to the park) and is in fair condition, according to the List of Classified Structures database (2011). • The Beacon Cottage serves as park housing and is in good condition. • The Rock and Haven Cottages are privately owned; the Rock Cottage is in good condition and the Haven Cottage in fair condition. • The Adams Cottage is used as the Highland Golf Links clubhouse; it has an API of 54 and is in good condition. • The Highland Golf Links landscape is in only fair condition due to erosion, invasive plants, and inappropriate fertilization and planting. Highland Golf Links has an API of 85 and is operated by Johnson Golf, a concessioner. • Highland Light Station has an API of 93 and is in good condition. It is operated by the U.S. Coast Guard and tours are given by Eastern National. • The 1857 Keeper’s Quarters has an API of 69 and is in good condition. It is used as a bookstore and museum, both of which are operated by Eastern National. • The Highland Light Grounds has an API of 65. <p>Trends</p> <ul style="list-style-type: none"> • Managers of the Highland Golf Links are beginning to implement green practices such as reducing the use of fertilizer and pesticides. • The cliffs overlooking the Atlantic are eroding at a 100-year average rate of about 3 feet per year although some areas have experienced rates on shorter timespans approaching 5–20 feet per year.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Coastal erosion threatens the landscape and structures, particularly the integrity of the Highland Golf Links and Highland Light. • Structures are subject to wildlife infestation (e.g., insects, bats, mold) and damage from storms and humidity. • The light tower at Highland Light is cracking and spalling due to a lack of ventilation and to modifications to the tower that facilitated its relocation in 1996 prior to the National Park Service assuming ownership. There also is a rusted and corroded beam beneath the watch deck. Efforts to correct these problems are underway. • Invasive species, insects, and plant diseases threaten the landscape. • Fiscal constraints can hamper ongoing maintenance of resources and significant repairs to the Highland Light tower required to mitigate moisture damage. • Concession and commercial pressures can adversely affect resource stewardship. • The historic character of the Highland Golf Links could be threatened by pressure from contemporary golfers who demand a more modern, manicured appearance. • The Truro Historical Society will require a revenue stream for the upkeep of the Highland House due to global climate change. • Increased precipitation and frequency of extreme precipitation events threaten historic structures in the historic district. • Seasonal shifts caused by global climate change may affect vegetation and the look of the cultural landscape. <p>Opportunities</p> <ul style="list-style-type: none"> • Enhance resource protection and visitor experiences in cooperation with Eastern National, the Truro Historical Society, Johnson Golf (the concession operator), and other partners by integrating cultural and ecosystem stewardship protection strategies.

Fundamental Resource or Value	Cultural Resources: Truro Highlands Historic District
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Truro Historical Society • Adjacent private landowners • Eastern National • Johnson Golf (concession operator) • Members of Highland Golf Links and other golfers • U.S. Coast Guard • Truro residents
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Updated historic structure report for Highland House. • Alternative materials research for historic structures. • Shoreline vulnerability assessment.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Sustainable golf course management plan for Highland Golf Links. • Cultural landscape report and treatment plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • Architectural Barriers Act of 1968 • Historic Sites Act of 1935 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 5) "Cultural Resource Management" • Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook • Director's Order 28: Cultural Resource Management • Director's Order 28A: Archeology • The Secretary of Interior's Standards for the Treatment of Historic Properties • The Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes





Fundamental Resource or Value	Cultural Resources: Coastal Lifesaving Heritage Sites
Related Significance Statements	Significance statement 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Nauset Light and the Three Sisters have been decommissioned by the U.S. Coast Guard. Each lighthouse, after preservation efforts in the late 20th century, is in fair condition, according to the List of Classified Structures database (2011). • The national seashore manages the Three Sisters and gives guided tours. Two of the lighthouses are missing their tops because they were removed during decommissioning. • Nauset Light is operated by the Nauset Light Preservation Society, a nonprofit organization. Regular tours are given in which visitors can climb to the top of the lighthouse. The oil house contains museum exhibits. • Nauset Light is believed to be safe from erosion for 75–100 years. • Old Harbor Life-Saving Station is the only surviving unaltered example of 13 stations that were built along the Outer Cape beach in the late 19th and early 20th centuries. It serves as a museum dedicated to the U.S. lifesaving service story. It has an API of 80 and is in good condition. • In summer, breeches buoy rescue reenactments are conducted at Old Harbor Life-Saving Station. • Race Point Coast Guard Station (API 61), Boat House (API 60), and Garage (API 54) are in good condition, and the Storage Shed (API 54) is in fair condition. The station is currently used as a ranger station. • Nauset Coast Guard Station and Bath House have an API of 71 and are in good condition. Nauset Coast Guard Station is a good example of New England coast guard style for stations built during this period. It is periodically used for education programs while it awaits rehabilitation. • Pamet River Coast Guard Station is used for an overnight environmental education program by local schools during the school year and is leased to Hostelling International in the summer. Pamet River Coast Guard Station has no historic structure report or documentation. <p>Trends</p> <ul style="list-style-type: none"> • Race Point and Pamet River Coast Guard Stations are actively used and well maintained.

Fundamental Resource or Value	Cultural Resources: Coastal Lifesaving Heritage Sites
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> All of these coastal structures are susceptible to water intrusion damage from storms and, to different degrees, from coastal erosion, both of which are projected to increase with climate change. Nauset Coast Guard Station is vacant, pending a plan for a new use. <p>Opportunities</p> <ul style="list-style-type: none"> Enhance partnerships with the Nauset Light Preservation Society to improve interpretation and the visitor experience at the lighthouse. Assist and enhance educational programs at Pamet River Coast Guard Station.
<p>Stakeholders</p>	<ul style="list-style-type: none"> Nauset Light Preservation Society Volunteers-in-Parks (Three Sisters lighthouse tours) Educators and the Parks as Classrooms program for Nauset and Pamet River Coast Guard Stations New England Lighthouse Foundation Family/descendants of keepers at Race Point Light Cape Cod National Seashore staff who use Coast Guard stations and Old Harbor for office space or programs
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> Updated List of Classified Structures condition assessments. Historic structure reports for coastal lifesaving heritage resources. Historic American Buildings Survey documentation for coastal lifesaving heritage resources. Cultural landscape inventory for Nauset Light properties. National register documentation for all structures except Highland Light. Alternative materials research for historic structures. Shoreline vulnerability assessment.
<p>Planning Needs</p>	<ul style="list-style-type: none"> Climate change adaption plan / strategic plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> Americans with Disabilities Act Archaeological Resources Protection Act of 1979 Archeological and Historic Preservation Act of 1974 Architectural Barriers Act of 1968 Historic Sites Act of 1935 National Environmental Policy Act of 1969 National Historic Preservation Act of 1966, as amended Executive Order 11593, "Protection and Enhancement of the Cultural Environment" "Protection of Historic Properties" (36 CFR 800) Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> NPS Management Policies 2006 (chapter 5) "Cultural Resource Management" Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook Director's Order 28: Cultural Resource Management The Secretary of Interior's Standards for the Treatment of Historic Properties

Fundamental Resource or Value	Cultural Resources: Dune Shacks of the Peaked Hill Bars Historic District
Related Significance Statements	Significance statements 6 and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Shacks in good condition are as follows: <ul style="list-style-type: none"> • Theodore and Eunice Braaten Shack (API 41) • Leo Fleurant Shack (API 33) • David and Marcia Adams Shack (API 33) • Hazel Hawthorne Werner (Euphoria) Shack (API 41) • Hazel Hawthorne Werner (Thalassa) Shack (API 41) • Jeanne Chanel Shack (API 33) • Al Fearing (Fuller-Bessay) Shack (API 33) • David and Marcia Adams Guest Cottage (API 33) • Nathaniel and Mildred Champlin Shack (API 41) • Randolph and Anabelle Jones Shack (API 41) • David and Connie Armstrong Shack (API 41) • Margaret Watson Shack (API 33) • Shacks in fair condition are as follows: <ul style="list-style-type: none"> • Boris Margo and Jan Gelb Shack (API 41) • Jean Miller Cohen Shack (API 41) • Harry Kemp Shack (API 33) • Stanley and Laura Fowler Shack (API 41) • The Nicholas and Ray Wells Shack (API 41) is in poor condition. • The Malkin-Ofsevit Dune Shack (API 41) is listed as a contributing resource in the national register nomination. It has no condition rating. • The landscape within the Dune Shacks of the Peaked Hill Bars Historic District is in good condition. Shifting sands contribute to the character of the dune landscape, and thus cultural and natural values are as well preserved as can be expected under those environmental conditions. <p>Trends</p> <ul style="list-style-type: none"> • Continual wind and wave erosion may necessitate the future relocation of the shacks. • In recent years, the National Park Service, local partners, and individual lessees have cooperated to preserve the fragile dune shacks and make them available for continued residency. • Increased storm intensity and storm surge accelerate erosion associated with vulnerable siting and climate change impacts.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Beach erosion, winds, and storms constantly impact the landscape and structures of the Peaked Hill Bars Historic District. • Individual dune shacks are liable to suffer weather-related damage, which is likely to be exacerbated by climate change. • Erosion and accretion of sand should be monitored and eventual relocations by the National Park Service or lessees evaluated.

Fundamental Resource or Value	Cultural Resources: Dune Shacks of the Peaked Hill Bars Historic District
<p>Threats and Opportunities</p>	<p>Threats (continued)</p> <ul style="list-style-type: none"> • Issues of visitor capacity include conflicts among users and the concerns of lessees about privacy. • Several shacks are under one-year management permits that need conversion to longer term contracts. • Succession/vegetation change is changing the character of the cultural landscape. • Seasonal shifts caused by global climate change may affect vegetation and the look of the cultural landscape. • Delays in implementation of the dune shack preservation and use plan may negatively impact historic buildings. <p>Opportunities</p> <ul style="list-style-type: none"> • Partnership opportunities with groups that oversee management and promote preservation of the dune shacks. These are the Peaked Hill Trust, Provincetown Community Compact, and Outer Cape Artist in Residency Consortium. • The national seashore’s 2012 preservation and use plan calls for long-term management contracts that would improve long-term management of the historic district. • Relocations in response to climate change adaptation.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Outer Cape Artist in Residence Consortium • Peaked Hill Trust • Cape Cod National Seashore Advisory Commission • Provincetown Community Compact • Provincetown residents and town officials
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Updated List of Classified Structures condition assessments. • Historic American Buildings Survey documentation. • Monitoring and evaluation of foot traffic in the Dune Shacks historic district.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • None identified.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • Architectural Barriers Act of 1968 • Historic Sites Act of 1935 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Executive Order 11593, “Protection and Enhancement of the Cultural Environment” • “Protection of Historic Properties” (36 CFR 800) • Secretarial Order 3289, “Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources” <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 5) “Cultural Resource Management” • Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook • Director’s Order 28: Cultural Resource Management • The Secretary of Interior’s Standards for the Treatment of Historic Properties

Fundamental Resource or Value	Cultural Resources: Fort Hill Rural Historic District
Related Significance Statements	Significance statements 5 and 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • The Penniman House (API 80) is in good condition and was rehabilitated in 2015–2016. • The Penniman House Barn (API 69) is in fair condition and needs significant structural repair, which is beginning in 2017. • Penniman House decorative wooden fence and stone retaining walls were rehabilitated in 2015–2016. • The Fort Hill Area stone walls are in fair condition. • The overall Fort Hill landscape is in good condition. • The boardwalk trail through the Red Maple Swamp was closed and is undergoing repairs and replacement in 2017. • Fort Hill is an important habitat for birds and monarch butterflies. <p>Trends</p> <ul style="list-style-type: none"> • Fire and mowing are applied periodically to keep the fields open, but pasture grasses are being gradually replaced by coarser vegetation, and the kettle-hole wetlands are becoming drier due to natural processes of eutrophication. • Nonnative and invasive vegetation is encroaching into the historic district. • Ongoing field maintenance monitoring of the burn and mow cycle is essential.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Exposure to the elements makes exterior maintenance of the Penniman House and Barn challenging, and maintenance issues are likely to be exacerbated by climate change. • Nonnative and invasive vegetation is encroaching into the historic district, changing the character of the landscape. • Fire management may be unable to fulfill annual and seasonal role in maintaining open landscape. • Annual/seasonal staff needs for fire management may not be met, given variable staffing levels. • Seasonal shifts caused by global climate change may affect vegetation and the look of the cultural landscape. <p>Opportunities</p> <ul style="list-style-type: none"> • Continued implementation of the 2007 condition report for the Fort Hill Rural Historic District to improve conditions in the district. Recommendations include improving circulation, signage, and waysides in the district, reestablishing views to surrounding fields and Nauset Marsh, rehabilitating trails, preserving stone walls, and conserving kettle holes. • Maintain the Red Maple Swamp Trail boardwalk with improved methods and materials.
Stakeholders	<ul style="list-style-type: none"> • Friends of Cape Cod National Seashore • Eastham residents • Private landowners within historic district
Data and/or GIS Needs	<ul style="list-style-type: none"> • None identified.
Planning Needs	<ul style="list-style-type: none"> • None identified.

Fundamental Resource or Value	Cultural Resources: Fort Hill Rural Historic District
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • Architectural Barriers Act of 1968 • Historic Sites Act of 1935 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Native American Graves Protection and Repatriation Act of 1990 • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 5) "Cultural Resource Management" • Director's Order 12: <i>Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • Director's Order 28: <i>Cultural Resource Management</i> • Director's Order 28A: <i>Archeology</i> • <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> • <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties</i> • <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>





Fundamental Resource or Value	Cultural Resources: Nauset Archeological District
Related Significance Statements	Significance statement 5.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> The sites around Nauset Marsh are hidden from view by soil and vegetation, which protects the sites but it makes it difficult for visitors to envision ancient settlements. Sites are monitored by the park archeologist when the position is filled or by the regional archeologist. <p>Trends</p> <ul style="list-style-type: none"> Infrastructure projects, including road, stormwater, and water line work, are often proposed for this rather densely developed area.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> Although its exact location is not publicly known, the Nauset Archeological District is vulnerable to disturbance. Increases in sea level and precipitation intensity as a result of climate change pose a threat to in situ archeological resources. Eroded trails and off-trail hiking may threaten in situ archeological resources. <p>Opportunities</p> <ul style="list-style-type: none"> The Nauset story could be told at the Salt Pond Visitor Center, particularly in the relatively new American Indian exhibit. The site should be managed so that it is undisturbed to the maximum extent possible.
Stakeholders	<ul style="list-style-type: none"> Mashpee Wampanoag Tribe Wampanoag Tribe of Gay Head–Aquinnah Massachusetts State Historic Preservation Office
Data and/or GIS Needs	<ul style="list-style-type: none"> Additional archeological surveys.
Planning Needs	<ul style="list-style-type: none"> Climate change adaptation plan / strategic plan.

Fundamental Resource or Value	Cultural Resources: Nauset Archeological District
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Antiquities Act of 1906 • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • Historic Sites Act of 1935 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Native American Graves Protection and Repatriation Act of 1990 • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 5) "Cultural Resource Management" • Director's Order 12: <i>Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • Director's Order 28: <i>Cultural Resource Management</i> • Director's Order 28A: <i>Archeology</i> • <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> • <i>The Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>



Fundamental Resource or Value	Cultural Resources: Archeological Sites (upland and submerged)
Related Significance Statements	Significance statements 5 and 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Several areas of archeological interest are: <ul style="list-style-type: none"> • Pilgrim Heights and High Head sites • Wellfleet Tavern site • Carns site • Submerged archeology (e.g., shipwrecks) • Conditions of the sites are good to fair. <p>Trends</p> <ul style="list-style-type: none"> • Periodic threats to archeological sites are reported.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Sea level rise / erosion in coastal areas may reveal or destroy archeological sites, particularly at Great Island. • Theft or destruction of archeological resources continues to threaten those resources within the national seashore (e.g., Fresh Brook village and other sites). • There is a limited ability to conduct patrols and other proactive work due to staffing levels and competing priorities. • Trails near archeological sites need ongoing maintenance to avoid rutting and erosion of sites. • Ongoing ground-disturbing activities threaten sites (e.g., utility work in archeologically sensitive areas, accidental damage during regular park operation activities). <p>Opportunities</p> <ul style="list-style-type: none"> • Increased awareness of archeological resources among academic institutions offers opportunities for surveying, documentation, and scholarly study. • Routine law enforcement patrols could reduce or eliminate the incidence of theft or destruction of archeological resources. • Partnerships (e.g., “adopt a site” program) could foster stewardship of archeological resources and offer opportunities for surveying, documentation, and research. • Opportunities to leave archeological resources undisturbed should be considered whenever possible for the long-term protection of resources and to preserve site integrity.
Stakeholders	<ul style="list-style-type: none"> • Mashpee Wampanoag Tribe • Wampanoag Tribe of Gay Head–Aquinnah • State Historic Preservation Office • Local historical societies and historical commissions • Cape Cod Commission
Data and/or GIS Needs	<ul style="list-style-type: none"> • Submerged archeological survey. • Predictive modeling of archeological sites (e.g., Great Island). • Additional archeological surveys.
Planning Needs	<ul style="list-style-type: none"> • Protocol for documenting submerged finds. • Protection plans for key areas to address looting (e.g., Fresh Brook) and for sites requiring stabilization.

Fundamental Resource or Value	Cultural Resources: Archeological Sites (upland and submerged)
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Antiquities Act of 1906 • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • Historic Sites Act of 1935 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Native American Graves Protection and Repatriation Act of 1990 • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 5) "Cultural Resource Management" • Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook • Director's Order 28: Cultural Resource Management • Director's Order 28A: Archeology • The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation • The Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes



Fundamental Resource or Value	Cultural Resources: Museum and Archival Collections
Related Significance Statements	Significance statements 5 and 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • The national seashore's archeology collection includes more than a half million items and 100,000 archival records, with most objects from the Cape Cod Survey and the Carns archeology site. There are 80,000 historical archeological objects from the 19th-century Great Island Tavern and 12,000 objects from the Atwood-Higgins site. The collection also includes field finds and donations by local amateur archeologists. • The national seashore's historical collection includes about 13,000 items pertaining to the national seashore's historical themes. More than 500 items are displayed in the Salt Pond Visitor Center. Smaller selections of artifacts are displayed at the Province Lands Visitor Center and the Highland Light Keeper's House. Of special note is the collection of several hundred pieces of scrimshaw. • The national seashore's archival collection includes papers related to the history and genealogy of Lower Cape American Indians, the Atwood-Higgins estate, Guglielmo Marconi, Cape Cod National Seashore legislation, and park management and administrative records. • The biological diversity of Cape Cod is represented by about 1,300 herbarium sheets, 500 mounted insects, 86 wet specimens, and records related to these specimens. There are 21 examples of rock types indicative of the Cape's glacial origins. No objects are stored outside the national seashore, but there are objects on long-term loan for exhibit. <p>Trends</p> <ul style="list-style-type: none"> • Because of the national seashore's limited resources, its collecting policy is tightly focused. According to the national seashore's 2013 scope of collection statement, the national seashore focuses its new acquisitions in the following areas: Old Harbor Life Saving Station, Penniman family, Outer Cape lighthouses, cranberry production, French cable and Marconi transoceanic communications, colonial and modern architecture, Outer Cape fishing industry, ethnography of native people and immigrant populations, and establishment of the Cape Cod National Seashore. Natural history specimens are collected to meet management-recognized research needs and for exhibits.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Humidity and temperature control are critical. • Physical security is a concern. • Professional oversight of collection management is insufficient because the curator position is vacant; the position is slated to be filled in 2017. • Conservation needs and treatment of collections are undertaken as financial resources and outside assistance permit. • Lacking a curator and park Native American Graves Protection and Repatriation Act specialist, the national seashore would require outside assistance if there were a Native American Graves Protection and Repatriation Act request. • Ongoing utility, security, and structural issues at the collections building threaten the collection.

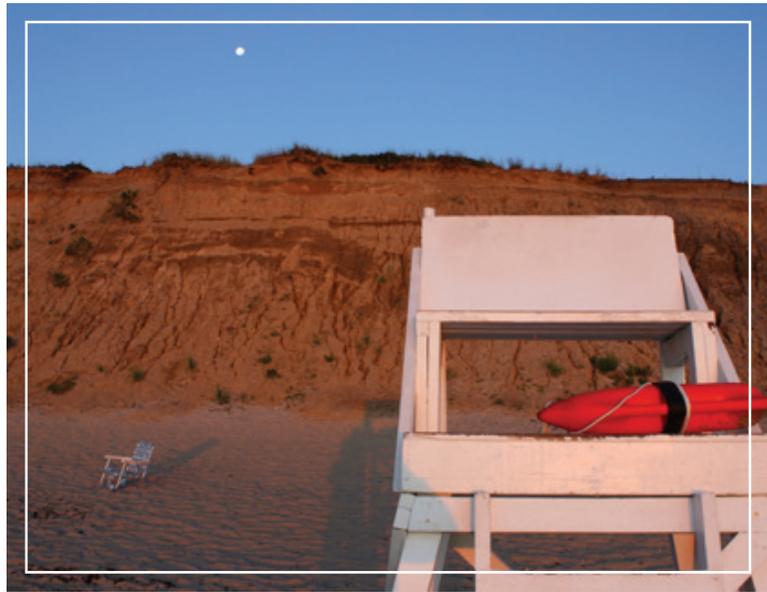
Fundamental Resource or Value	Cultural Resources: Museum and Archival Collections
<p>Threats and Opportunities</p>	<p>Opportunities</p> <ul style="list-style-type: none"> • With the subject areas identified in the national seashore’s scope of collections statement for further acquisitions, there are many opportunities for enlarging the collections although funding opportunities are constrained. • The collections and archives should be professionally maintained to ensure proper long-term storage and protection of the collections and to expand use of the national seashore’s collections in interpretive and educational programming. • Strategic planning with other NPS parks is needed to resolve collections management issues. • Relationship with tribes (frequent formal consultation on section 106 and National Environmental Policy Act projects) should continue. • Consultation on NPS projects of mutual interest such as the ongoing ethnographic overview and assessment should continue.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Friends of Cape Cod National Seashore • Volunteers • Mashpee Wampanoag Tribe • Wampanoag Tribe of Gay Head–Aquinnah • State Historic Preservation Office
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • None identified.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Collections management plan (update).
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Antiquities Act of 1906 • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • National Historic Preservation Act of 1966, as amended • Native American Graves Protection and Repatriation Act of 1990 • Paleontological Resources Preservation Act of 2009 • Executive Order 11593, “Protection and Enhancement of the Cultural Environment” • “Curation of Federally-owned and Administered Archaeological Collections” (36 CFR 79) • “Protection of Archaeological Resources” (43 CFR 7) • Secretarial Order 3289, “Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources” <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 5) “Cultural Resource Management” • Director’s Order 24: <i>NPS Museum Collections Management</i> • Director’s Order 28: <i>Cultural Resource Management</i> • Director’s Order 28A: <i>Archeology</i> • NPS <i>Museum Handbook</i>, parts I, II, and III • <i>The Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation</i>

Fundamental Resource or Value	Cultural Resources: Marconi Station Site (commemorative site)
Related Significance Statements	Significance statement 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> The Marconi Station site, and its antennae towers, is now a ruin and is a commemorative site with a wayside. The site is in poor condition. Its grounds have an API of 58 and are in good condition. New interpretive exhibits are being implemented. A small Marconi exhibit is available for public viewing at national seashore headquarters. <p>Trends</p> <ul style="list-style-type: none"> Coastal erosion is increasingly encroaching on the Marconi Station site.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> The coastal bluffs are vulnerable to erosion that imperils the last remnants of the Marconi Station site. Erosion will probably accelerate with climate change. <p>Opportunities</p> <ul style="list-style-type: none"> Radio events help tell the story of wireless communications. The overlook platform provides a nice view and place at which to reach audiences concerning heathland preservation. It needs an accessible trail.
Stakeholders	<ul style="list-style-type: none"> Marconi family Wellfleet residents Amateur radio operators Italian citizens
Data and/or GIS Needs	<ul style="list-style-type: none"> None identified.
Planning Needs	<ul style="list-style-type: none"> None identified.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> Americans with Disabilities Act Archaeological Resources Protection Act of 1979 Archeological and Historic Preservation Act of 1974 Historic Sites Act of 1935 National Environmental Policy Act of 1969 National Historic Preservation Act of 1966, as amended Executive Order 11593, "Protection and Enhancement of the Cultural Environment" "Protection of Historic Properties" (36 CFR 800) Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> NPS <i>Management Policies 2006</i> (chapter 5) "Cultural Resource Management" Director's Order 24: <i>NPS Museum Collections Management</i> Director's Order 28: <i>Cultural Resource Management</i> Director's Order 28A: <i>Archeology</i> NPS <i>Museum Handbook</i>, parts I, II, and III <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>

Fundamental Resource or Value	Visitor Experience: Salt Pond Visitor Center and Province Lands Visitor Center
Related Significance Statements	Significance statement 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • The Salt Pond Visitor Center is the national seashore’s gateway visitor facility. Its museum exhibits (updated 2011) reflect the vast range of natural and cultural themes represented on Cape Cod. The complex includes an amphitheater, trailheads for the Buttonbush and Nauset Marsh trails, and the Doane Rock area. The Salt Pond Visitor Center overlooks scenic Salt Pond. • The Province Lands Visitor Center is open seasonally and has a 360-degree view of the Province Lands dunes, Outer Beach, and Atlantic Ocean. The complex includes an amphitheater and trailhead for bicycle trails. The parking lot and the back deck offer scenic dune and ocean views. • Besides being fundamental resources as visitor facilities, the visitor centers are important cultural resources. The modernistic visitor centers are a clear departure from the traditional rustic architecture of parks. They have features typical of NPS Mission 66 visitor centers such as views of the landscape through glass, separate wings for museums and theaters, and concrete, glass, and steel throughout. The Salt Pond Visitor Center was found eligible for the National Register of Historic Places in 2000 and Province Lands Visitor Center is presumed to be eligible. • The two facilities are consistently kept in good condition through regular maintenance attention and fixture and equipment replacement projects. • The Salt Pond Visitor Center is in good condition (API 88). The Salt Pond Vista Area has been undergoing improvements in recent years (API 68). • The Province Lands Visitor Center requires improvements to the doors, roof, amphitheater, and interior (API 88), which are planned to occur in 2017 and 2018. • An inviting experiential atmosphere is provided at the visitor centers to begin engagement in the national seashore experience. <p>Trends</p> <ul style="list-style-type: none"> • Exterior facilities, including access to trailheads, picnic areas, amphitheater seating, and exterior access to restrooms, are increasingly enjoyed.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Ongoing maintenance of aging and complicated heating, ventilation, and air-conditioning systems is needed. • Nutrient loading to Salt Pond from the leaching field and to Buttonbush Pond from the parking lot must be monitored and reduced. • Climate change-driven increases in sea level and precipitation intensity pose a threat to facilities. • Social trails adjacent to Province Lands Visitor Center threaten dune ecosystems. <p>Opportunities</p> <ul style="list-style-type: none"> • Amphitheater rehabilitation projects should incorporate shade structures to make the performing and convening areas more useful and versatile. • Ongoing updating of films and media. • Improve accessibility and trail connections at Province Lands Visitor Center to improve resource understanding. • New park film to supplement the 1970s films (in development).

Fundamental Resource or Value	Visitor Experience: Salt Pond Visitor Center and Province Lands Visitor Center
Stakeholders	<ul style="list-style-type: none"> • Outer Cape towns • Friends of Cape Cod National Seashore • Tourism community and local chambers of commerce • Bus tour operators • Volunteers • Eastern National
Data and/or GIS Needs	<ul style="list-style-type: none"> • Shoreline vulnerability assessment. • Analysis of wastewater management. • Accessibility assessment.
Planning Needs	<ul style="list-style-type: none"> • Accessibility improvement plan (phased approach). • Climate change adaption plan / strategic plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Architectural Barriers Act of 1968 <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 7) "Interpretation and Education" • NPS Management Policies 2006 (chapter 9) "Park Facilities" • Director's Order 42: <i>Accessibility for Visitors with Disabilities in National Park Service Programs and Services</i>





Fundamental Resource or Value	Visitor Experience: NPS-Lifeguarded Beaches
Related Significance Statements	Significance statements 1 and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> The national seashore’s southernmost beach, Coast Guard Beach in Eastham, is consistently chosen as one of America’s top 10 beaches by Dr. Stephen Leatherman (Florida International University), also known as Dr. Beach. Herring Cove Beach, in the northern district of the national seashore, is strongly preferred by residents of and visitors to Provincetown. Each beach has its constituency and its charm, and national seashore staff makes an effort to present clean, safe, and enjoyable amenities, particularly in the summer season. The conditions of visitor access facilities, according to the Asset Priority Index (API) and the Facility Condition Index (FCI) (all assets 0.10 or less are in good condition; 0.11-0.14, fair condition; 0.15-0.49, poor condition; 0.50 or greater, serious condition), are: <ul style="list-style-type: none"> Coast Guard Beach (Eastham): Coast Guard Beach Trail (API 81, FCI 0.080 (Good)); Access Trail (API 81, FCI 0.000 (Good)); Shuttle Pickup (API 77, FCI 0.386 (Poor)); Bus Stop Parking (API 77, FCI 0.255 (Poor)) Nauset Light Beach (Eastham): Access Trail (API 81, FCI 0.247 (Poor)); Parking (API 77, FCI 0.898 (Serious)) Marconi Beach (South Wellfleet): Access Trail (API 81, FCI: 0.000 (Good)); Parking (API 77, FCI 0.602 (Serious)) Head of the Meadow Beach (North Truro): Access (API 81, FCI 0.000 (Good)); Parking (API 77, FCI 0.001 (Good)) Race Point (Provincetown): Access Trail (API 81, FCI 0.000 (Good)); Parking (API 77, FCI 0.261 (Poor)) Herring Cove Beach (Provincetown): Access (API 81, FCI 0.000 (Good)); Parking (929) (API 77, FCI 0.259 (Poor)); Parking (946) (API 77, FCI 0.000 (Good)) <p>Trends</p> <ul style="list-style-type: none"> Coastal vulnerability of Herring Cove Beach North and Nauset Light Beach facilities to storm activity has required replacement project funding. Routine replacement of ocean beach stairways is occurring on a more regular basis. Archeological and paleontological resources are sometimes revealed by erosion.

Fundamental Resource or Value	Visitor Experience: NPS-Lifeguarded Beaches
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> Public safety issues, including beach bacteria, sharks, riptides, sunburns, separated parties, and other injuries, are a constant consideration. Sea level rise and coastal erosion are concerns for maintaining beach access, such as stair access down the bluffs. Threatened and endangered species-related closures may disrupt beach management operations and access. Lifeguard recruitment / applicant pool is lean. The coastal bluffs and stairs present access challenges to get injured individuals off the beach. Weather-related evacuation is needed during summer beach operations. Coastal erosion will limit parking availability. Uncovered trash receptacles and food scraps left on the beach attract predators that, in turn, predate threatened, endangered, and other special status species. Shipwreck remnants periodically appear in the surf zone. <p>Opportunities</p> <ul style="list-style-type: none"> Educational opportunities including natural resources, dune preservation, safety and rescue demonstrations, fishing/surfcasting, and beach cleanups. Implementation of innovative affordable designs for public access and infrastructure as coastal change warrants. Building for resilience and retreat (including relocated or remote parking and shuttle buses) at some beaches to replace lost parking. Coordination of regulations and fees with town beaches. Collaborative efforts to fence vulnerable areas and protect species in areas where adjacent lands are owned by others.
Stakeholders	<ul style="list-style-type: none"> Beachgoers Outer Cape towns
Data and/or GIS Needs	<ul style="list-style-type: none"> Research on marine life (shark/seals) on human interaction and public safety. Shorebird monitoring and trend analysis. Analysis of meso-mammals as shorebird predator.
Planning Needs	<ul style="list-style-type: none"> Climate change adaptation plan / strategic plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> Americans with Disabilities Act Architectural Barriers Act of 1968 <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> NPS Management Policies 2006 (chapter 9) "Park Facilities" Director's Order 42: <i>Accessibility for Visitors with Disabilities in National Park Service Programs and Services</i> Director's Order 50C: <i>Public Risk Management Program</i> NPS Reference Manual 83D1: <i>Bathing Beaches</i>

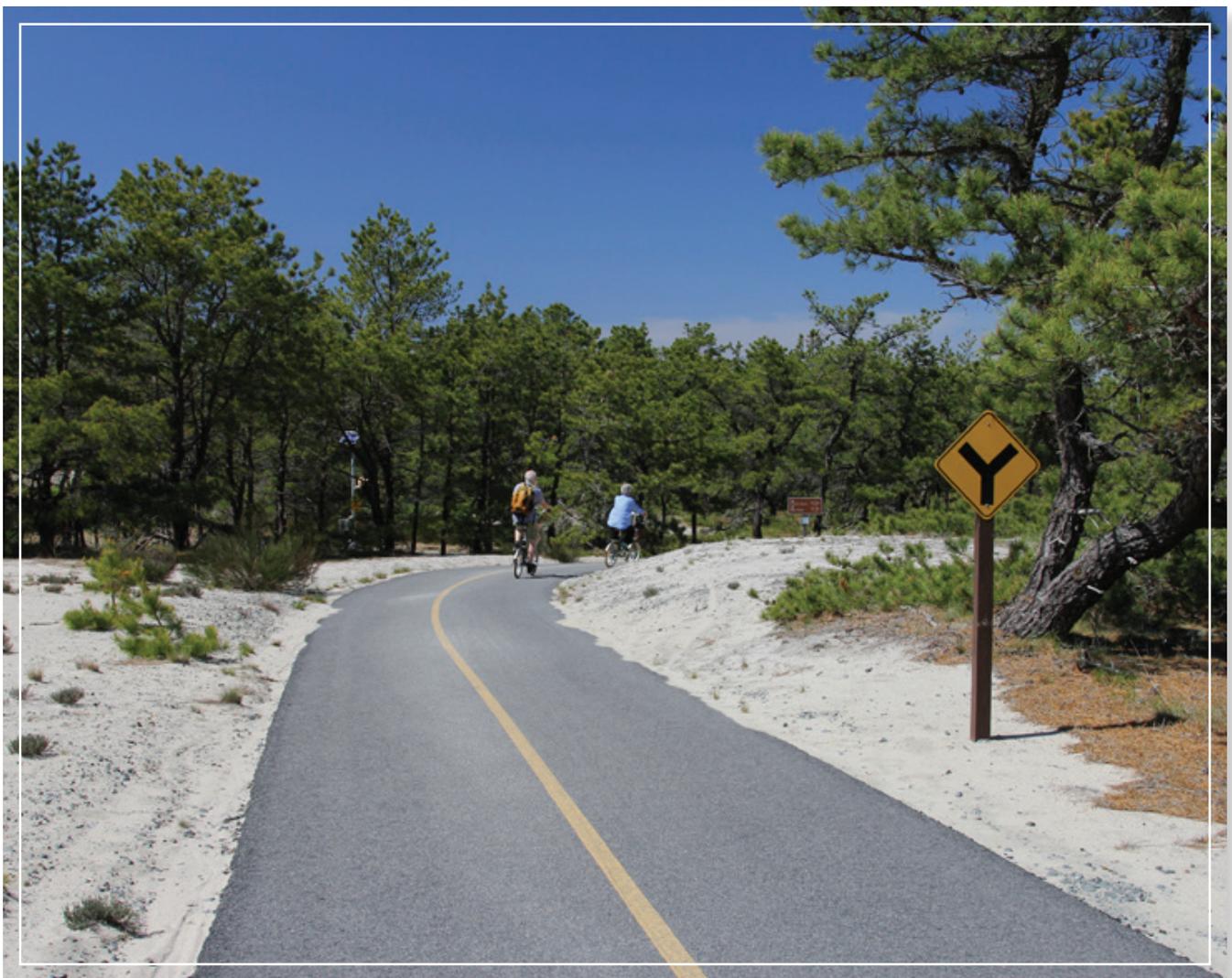


Fundamental Resource or Value	Visitor Experience: Cape Cod Experience
<p>Related Significance Statements</p>	<p>Significance statements 1, 2, 6, and 8.</p>
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • The area’s character is intricately tied to the ways of life of local communities. Traditional activities, which had an economic purpose, have included fishing, shellfishing, hunting, cultivating cranberries, and harvesting beach plums, berries, and mushrooms. Recreational activities, which were introduced in the late 19th and 20th centuries, have included swimming, sunbathing, surfcasting, hiking, birding, wildlife observation, and enjoying scenic views. • Traditional uses in balance with the natural environment are a part of distinctive cultural heritage and pattern of human activities that make the character of Cape Cod unique. • The Outer Cape has long been a place of solitude and spiritual renewal and has drawn many vacationers and residents. It has inspired a strong artistic tradition in literature, visual arts, and performing arts. <p>Trends</p> <ul style="list-style-type: none"> • Many long-time traditional uses and artistic and recreational activities are still enjoyed. • Youth and young families are leaving the Cape, and the proportion of retirees continues to increase. • The shift from seasonal to year-round residential use is influencing the development, consumer demand, and overall character of the Outer Cape. • New recreational activities are being considered in context of resource and visitor protection. • There is a continuous need to reach underserved populations and undertake audience development.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Climate change and coastal erosion may result in lost visitor experience opportunities. • New populations and new uses (e.g., geocaching, kiteboarding, hang gliding, fat bikes) could redefine the Cape experience. • Overscale residential development alters scenic views and the character of the Cape and increases threats to sensitive national seashore resources. • Changing landscape aesthetics (e.g., idealized suburban lawn) may not suit the character of the Outer Cape, and non-point source pollution resulting from the use of fertilizers could damage fragile resources.

Fundamental Resource or Value	Visitor Experience: Cape Cod Experience
Threats and Opportunities	<p>Threats (continued)</p> <ul style="list-style-type: none"> • The lack of jobs for year-round residents, particularly young adults, continues to price them out of the housing and labor markets. • Many perceive a loss of views and the sense of “old Cape Cod.” • A sense of wildness in the national seashore is being diminished by the fragmentation of habitat. • Harvesting activities require monitoring to avoid overuse. • The cost of recreational experiences and the declining affordability of the Cape could affect certain user groups. • Commercialization of gateway communities could introduce a suburban environment to the Outer Cape. <p>Opportunities</p> <ul style="list-style-type: none"> • The national seashore provides on-site experiences of natural and cultural values and processes. • Reaching new audiences, emphasis on youth, and reaching out to the Mid- and Upper Cape communities is important to sustaining a Cape Cod way of life. • Stewardship is important in maintaining the Cape Cod experience for year-round and seasonal residents and visitors; such stewardship has a large educational component. • Visitation should be managed to protect resources and minimize disturbances and impacts on plants and wildlife. Proliferation of damaging social trails should be managed and controlled with the objective of limiting the number of access points to a single destination or site. • Educational opportunities include celebrating the Cape’s heritage and experience, including at the Dune Shacks and Highlands Center venues. • Collaboration with local historical and natural groups conveys natural and cultural importance of the area. • Surfcasting and canoe programs and other interactive interpretive programs provide access to resource meanings. • A national seashore ozone advisory could be issued when monitoring and conditions indicate limits for ozone may be exceeded.
Stakeholders	<ul style="list-style-type: none"> • Local residents • Artists and writers • Fishers and shell fishers • Hunters, gatherers, off-road vehicle users such as Mass Beach Buggy Association
Data and/or GIS Needs	<ul style="list-style-type: none"> • Oral history. • Administrative history.
Planning Needs	<ul style="list-style-type: none"> • Updated visitor experience plan, including long-range interpretation.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Air Act of 1977 <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 7) “Interpretation and Education” • Director’s Order 6: <i>Interpretation and Education</i> • Director’s Order 75A: <i>Civic Engagement and Public Involvement</i>

Fundamental Resource or Value	Partnerships: Cape Cod Model
Related Significance Statements	Significance statements 1, 2, 3, and 6.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> The six Lower Cape towns retain ownership and operation of numerous parcels within the national seashore including ponds, beaches, parking lots, and roads. In addition, more than 600 parcels inside the national seashore are privately owned. Activities on all these lands potentially can have profound effects on protected resources and vice versa. <p>Trends</p> <ul style="list-style-type: none"> The mosaic of public and private land continues to present challenges. Cape Cod remains a desirable retirement destination, and seasonal homes are being converted to year-round use to satisfy demand.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> Lack of funds for land acquisition and enforcement hampers wildlife and land protection. Development of town lands for municipal facilities greatly increases the intensity of use within the national seashore. Development of subdividable lands is the most important private land protection concern. Tear-down and destruction of nonfederal historical structures could change the character of the Cape as modest structures are replaced. Truro’s lack of meaningful zoning measures continues to be the national seashore’s biggest zoning challenge. Inconsistent and variable engagement of and with towns due to changing personnel and issues of mutual concern can be problematic. Private owners encroaching on adjacent public land is an ongoing concern of park rangers. <p>Opportunities</p> <ul style="list-style-type: none"> The Cape Cod model provides for a community-based conservation ethic. Protection of larger landscapes and parcels is broadly supported. Working with zoning boards, planning boards, conservation commissions and boards of health is a means to achieve land and resource protection. Continued staff involvement in regional water and wastewater planning benefits the national seashore. Ample time should be set aside to participate in regional planning to achieve mutual goals. There are many allies in preserving the scale and massing of the Cape Cod architectural character. Efforts are collectively being made to moderate the increasing intensity of use. The influence of the Cape Cod formula on the national seashore, the national park system, and elsewhere is one of many topics being examined in the national seashore’s administrative history.

Fundamental Resource or Value	Partnerships: Cape Cod Model
Stakeholders	<ul style="list-style-type: none"> • Six Outer Cape towns • Landowners • Attorneys • Realtors • Land trusts • Cape Cod Commission
Data and/or GIS Needs	<ul style="list-style-type: none"> • Visual resource inventory.
Planning Needs	<ul style="list-style-type: none"> • Updated land protection plan. • Visual resource management plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • "Cape Cod National Seashore; Zoning Standards" (36 CFR 27) <p>NPS Policy-level Guidance (NPS <i>Management Policies 2006</i> and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 3) "Land Protection" • Director's Order 75A: <i>Civic Engagement and Public Involvement</i>



Fundamental Resource or Value	Partnerships: Cape Cod National Seashore Advisory Commission
Related Significance Statements	Significance statements 1, 2, 3, 4, 5, 6, 7, and 8.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • The Cape Cod National Seashore Advisory Commission meets regularly with the national seashore superintendent to discuss specific seashore issues and to remain knowledgeable about seashore programs, facilities, activities, and issues. As indicated by its name, the commission is advisory in nature. Some standing committees are in place to analyze park issues, seek public input, and make recommendations to the superintendent. In dealing with a particularly complex or controversial issue, the national seashore superintendent will occasionally ask the commission to explore the many sides of an issue and develop and present a report which the superintendent will consider in making a decision. • The advisory commission is subject to a sunset clause and may be allowed to expire. Historically, the advisory commission has been viewed as vital to the operation of the seashore and has been reauthorized by Congress many times since its original authorization in 1961. Currently, the advisory commission is set to expire in 2018. • The commission meets four to six times per year. • Subcommittees have included focus on the Dune Shacks and the Pilgrim Nuclear Plant Emergency Planning. <p>Trends</p> <ul style="list-style-type: none"> • There is a cycle of turnover on the commission. • Public attendance at commission meetings is generally low. • The authority of the commission has been successfully extended each time it has been slated to sunset.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • If the advisory commission expired and was not renewed by Congress, the seashore's relationship with the Outer Cape towns could be adversely affected. • Individuals could be appointed who do not participate with the intended spirit of the advisory commission, thus negating the benefits of the commission. • The current ad hoc selection process for commission membership could result in inconsistencies in engagement with the towns. • Tensions associated with adherence to NPS management policies (e.g., economic impacts) can affect the commission's effectiveness. <p>Opportunities</p> <ul style="list-style-type: none"> • The advisory commission maintains a relationship between towns and the national seashore and helps to ensure that the national seashore remains relevant to Outer Cape communities. • Commission meetings could be more actively promoted to encourage participation. • The commission encourages a community-based collaborative conservation ethic. • The national seashore and commission can work together to identify stakeholders. • The advisory commission supports partnership and community engagement by active involvement in resource management issues. • The commission can be an advocate for the national seashore as a collaborative steward. • The commissioners can promote public awareness of national seashore management issues with local towns, the Cape Cod Commission, and other partners.

Fundamental Resource or Value	Partnerships: Cape Cod National Seashore Advisory Commission
Stakeholders	<ul style="list-style-type: none"> • Towns of Provincetown, Truro, Wellfleet, Eastham, Orleans, and Chatham • Barnstable County • Commonwealth of Massachusetts • Secretary of the Interior
Data and/or GIS Needs	<ul style="list-style-type: none"> • None identified.
Planning Needs	<ul style="list-style-type: none"> • None identified.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Federal Advisory Commission Act (1972) • Government in the Sunshine Act (5 USC 552b) • Executive Order 12024, "Transfer of Certain Advisory Committee Functions" • Executive Order 12838, "Termination and Limitation of Federal Advisory Committees" • Office of Management and Budget Circular No. A-135 <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 1) "The Foundation" • Director's Order 75A: <i>Civic Engagement and Public Involvement</i>

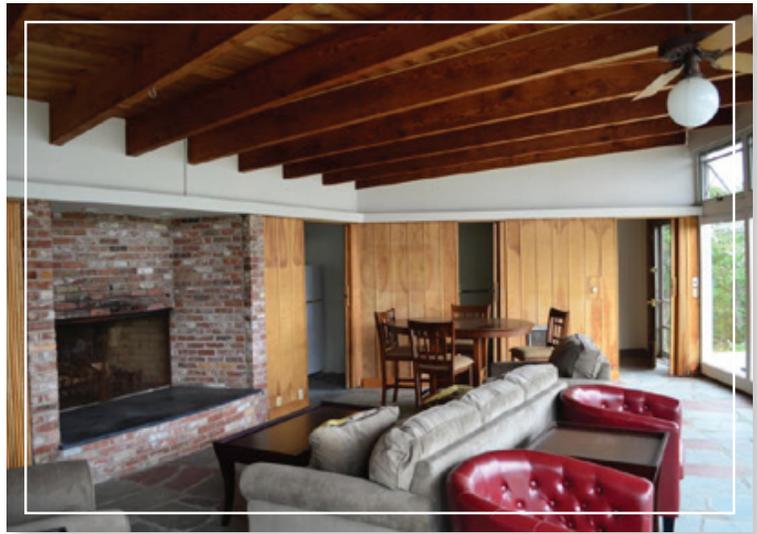


Analysis of Other Important Resources and Values

Other Important Resource or Value	Cultural Resources: Sites Related to the Outer Cape’s Cultural Heritage
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> Atwood-Higgins House is in good condition (API 63); Atwood-Higgins Country Store (API 41) in fair condition; Guest House (API 31) in fair condition; Barn (API 41) in poor condition; Wellhouse (API 31) in good condition; Woodshed (API 31) in fair condition; House Privy in good condition; Guest House Privy in poor condition; Hand Pump in fair condition; North West Privy in poor condition; Garage in good condition; Dry Well in fair condition; Arbor and Fence Segments in fair condition; the Grounds in good condition (FCI 0.000; API 41). Condition evaluations are from the 2011 cultural landscape inventory except for the Grounds, which rating is from the Facility Condition Index. The Baker-Biddle House is a good surviving example of a late 18th-century Cape Cod house. One-quarter of the archeological sites have been carefully surveyed. Two structures are objects in the landscape to tell their stories: <ul style="list-style-type: none"> The Bog House is in fair condition (API 41). French Cable Hut is in good condition. <p>Trends</p> <ul style="list-style-type: none"> The national seashore offers tours of the Atwood-Higgins House. There has been debate about whether the 20th-century structures built to reflect the colonial history of the Atwood House site should be preserved and interpreted, the conclusion being that these Colonial Revival structures are important in their own right. They are part of the Atwood-Higgins Historic District, which was listed in the national register in 2010.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> Most of the contributing 20th-century structures in the Atwood-Higgins Historic District are in either fair or poor condition, and long-term maintenance is an issue. Because of the density of cultural deposits within the Baker-Biddle House landscape, no ground-disturbing activities should take place without an archeologist present to monitor the work. <p>Opportunities</p> <ul style="list-style-type: none"> An archeological consultant has recommended an expanded archeological survey of the entire 10-acre Baker-Biddle House property. This survey would provide boundaries to the prehistoric loci that extend beyond the limits of the current survey and would be valuable for future planning purposes. The 20th-century buildings at Atwood Higgins could be leased out to aid in their preservation.
<p>Stakeholders</p>	<ul style="list-style-type: none"> Wellfleet and Truro Historic Commissions Biddle family descendants
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> Condition assessments of Atwood-Higgins Complex. Historic structure report for the Baker-Biddle buildings. National register documentation for Baker-Biddle House and property. Cultural landscape inventory for Pamet cranberry bog. Cultural landscape inventory for Baker-Biddle property. Expanded archeological survey for Baker-Biddle property. Oral history with members of Baker-Biddle family.
<p>Planning Needs</p>	<ul style="list-style-type: none"> Cultural landscape report for Pamet cranberry bog. Cultural landscape report for Baker-Biddle property.

Other Important Resource or Value	Cultural Resources: Sites Related to the Outer Cape's Cultural Heritage
<p>Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS <i>Management Policies 2006</i> and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 5) "Cultural Resource Management" • Director's Order 12: <i>Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • Director's Order 28: <i>Cultural Resource Management</i> • Director's Order 28A: <i>Archeology</i> • <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> • <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>





Other Important Resource or Value	Cultural Resources: Mid-Century Modern Homes
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • Many Mid-Century Modern houses are vacant and deteriorating. • The properties owned by the National Park Service are the Weidlinger, Kuhn, Hatch, Gips, Tisza, Sirna, Deane, Whitlock, Conover, Wilkinson, Gussack, and Kohlberg houses. <p>Trends</p> <ul style="list-style-type: none"> • The Cape Cod Modern House Trust's (2007) mission is to renovate and repurpose the significant modern houses owned by National Park Service as loci for creativity and scholarship. The trust has leased houses from the National Park Service and restored three of these vacant structures: Kugel/Gips House (1970, architect Charles Zehnder), Hatch Cottage (1961, architect Jack Hall), and Weidlinger House (1953, architect Paul Weidlinger). The trust also sponsors artist and scholar residencies, tours, symposia, and collaborations with schools of architecture. A lease for the Kohlberg House is in progress.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • The public and private Mid-Century Modern houses are extremely fragile, and their future as a group is uncertain due to pressures from increasing land values, homeowner aspirations, a lack of awareness and appreciation, and management challenges facing the National Park Service as steward. These issues affect not only individual buildings but also impinge on the scale, character, and delicate sense of place in the Outer Cape as a whole. • Global climate change is expected to increase storm intensity and frequency of potential damage to these houses. <p>Opportunities</p> <ul style="list-style-type: none"> • The Cape Cod Modern House Trust sponsors artist and scholar residencies, tours, symposia, and collaborations with schools of architecture. Combined with preservation projects, these activities offer important partnership opportunities to further the preservation and appreciation of the Outer Cape's Mid-Century Modern houses.
<p>Stakeholders</p>	<ul style="list-style-type: none"> • Cape Cod Modern House Trust
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Updated List of Classified Structures condition assessments. • Historic American Buildings Survey documentation. • Cultural landscape inventory for Mid-Century Modern properties.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Cultural landscape report for Mid-Century Modern properties.

Other Important Resource or Value	Cultural Resources: Mid-Century Modern Homes
<p>Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Archaeological Resources Protection Act of 1979 • Archeological and Historic Preservation Act of 1974 • National Environmental Policy Act of 1969 • National Historic Preservation Act of 1966, as amended • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • "Leasing Regulations" (36 CFR Part 18) • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS <i>Management Policies 2006</i> and <i>Director's Orders</i>)</p> <ul style="list-style-type: none"> • <i>NPS Management Policies 2006</i> (chapter 5) "Cultural Resource Management" • <i>Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and DO-12 Handbook</i> • <i>Director's Order 28: Cultural Resource Management</i> • <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> • <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties</i> • <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>



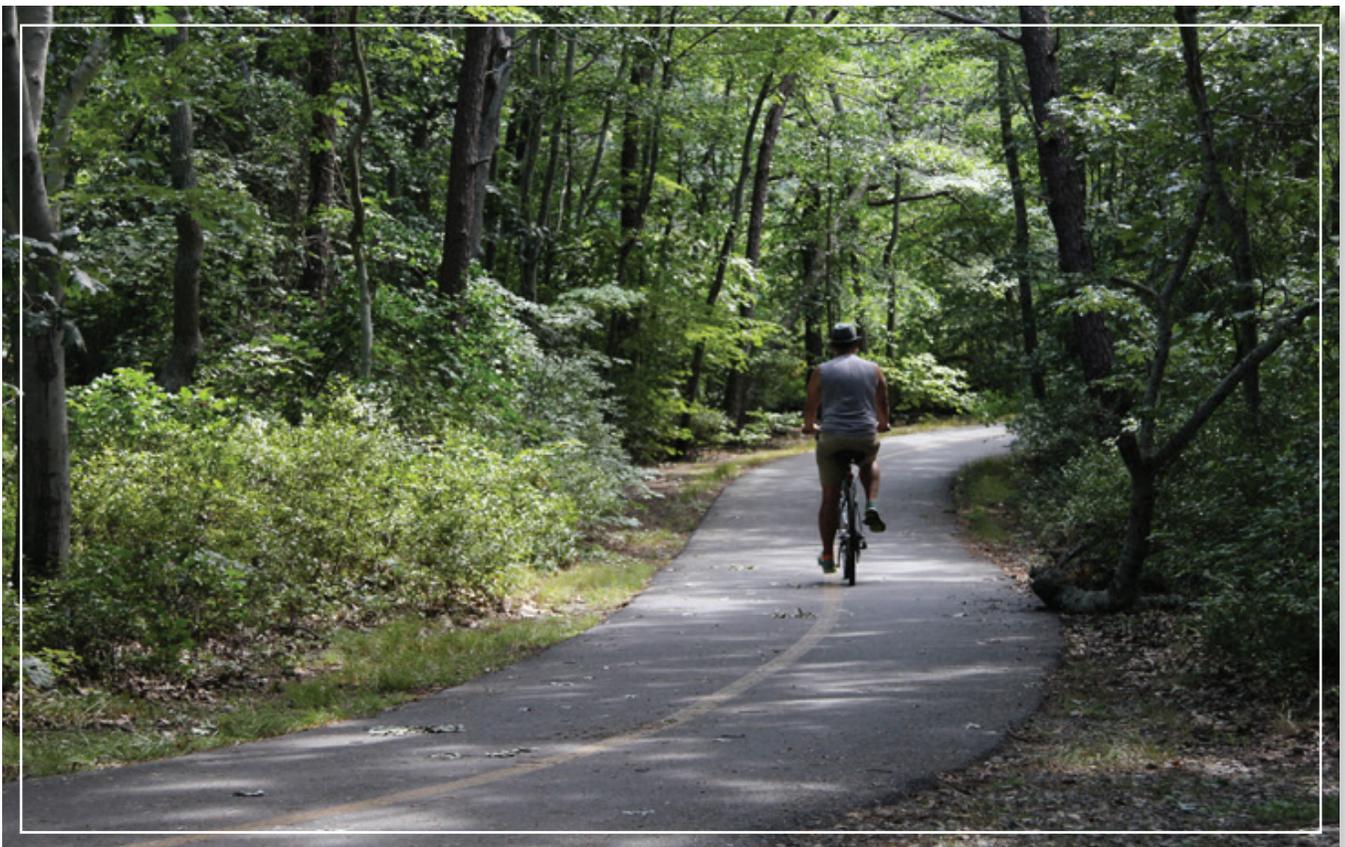
Other Important Resource or Value	Visitor Experience: Atlantic Research and Learning Center
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • The Atlantic Research and Learning Center consists of a green, multipurpose classroom with audio-visual capabilities and 50-person capacity. An adjacent analytical chemistry lab with instrumentation, hoods, and sinks can accommodate fresh, estuarine, and marine water sample analysis. • The Atlantic Research and Learning Center has a variety of amenities and support to facilitate research, including: <ul style="list-style-type: none"> • Cape Cod National Seashore's 44,600 acres of marine, estuarine, freshwater, and terrestrial ecosystems • Laboratory and desk space • Classroom and lecture auditorium • Field equipment • Analytical facilities • Housing • GIS and ecosystem monitoring data • Collaboration with Cape Cod National Seashore scientists • The Charles S. Davidson Memorial Library • Opportunities for science communication to the general public • Wi-Fi and links to networking capabilities and servers at North Atlantic Coastal Laboratory • The Atlantic Research and Learning Center works to communicate current science themes and research initiatives to a wide array of audiences in order to foster a positive exchange of information on physical and biological systems within Cape Cod National Seashore. <p>Trends</p> <ul style="list-style-type: none"> • Outreach activities include public presentations, publications, technical assistance to scientists and teachers, tour support, field trips and seminars for students, scientific review of scholarly work and funding proposals, and an annual public "Science in the Seashore" symposium.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Climate change, humidity, and storm threats to buildings and the Cape Cod grid increase challenges to data collection, storage, and processing. • Wildlife infestations, insects, and mold are routine issues. • The research center is remote from other park facilities. • Interruption of utilities threatens long-term data sets. <p>Opportunities</p> <ul style="list-style-type: none"> • Cape Cod National Seashore is home to a vibrant and diverse scientific community that includes staff scientists, scientists from various state and federal agencies, university researchers, technicians, and volunteers. The center can expand its activities by inventorying research opportunities. • Dispersed housing for researchers presents program management challenges and impedes collaboration. The development of centralized housing for researchers would address logistical issues and provide an improved environment for collaborative work similar to a research field station. • Green building options such as solar photovoltaic panels are being demonstrated at the center. • Integration of cultural and ecosystem objectives would advance the program.

Other Important Resource or Value	Visitor Experience: Atlantic Research and Learning Center
Stakeholders	<ul style="list-style-type: none"> • University of Rhode Island • U.S. Geological Survey • Center for Coastal Studies • National Marine Fisheries Service • Woods Hole Oceanographic Institution • Universities, research institutions • Other nonprofit groups such as local, regional, and nationwide environmental organizations and volunteer groups
Data and/or GIS Needs	<ul style="list-style-type: none"> • Catalog of existing research relevant to Atlantic Research and Learning Center.
Planning Needs	<ul style="list-style-type: none"> • Strategic plan for Atlantic Research and Learning Center.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Architectural Barriers Act of 1968 <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (chapter 9) "Park Facilities" • Director's Order 11D: Records and Electronic Information Management • Director's Order 42: Accessibility for Visitors with Disabilities in National Park Service Programs and Services • Director's Order 77: Natural Resource Protection



Other Important Resource or Value	Visitor Experience: Bicycle Trails
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • The 1.6-mile Nauset Bicycle Trail from Salt Pond Visitor Center to Coast Guard Beach passes through rolling terrain with marsh views, beach access, a picnic area, and a bridge across Nauset Marsh. • Head of the Meadow Bicycle Trail extends for 2 miles between Head of the Meadows Beach and East Harbor/Pilgrim Lake, through flat terrain with marsh views and beach access. It is slated for rehabilitation in the next few years (2018–2020). • Province Lands Bicycle Trail extends for 7.2 miles (with a 5.45-mile loop trail) between Province Lands Visitor Center and Race Point and Herring Cove Beaches. It passes through rolling terrain, open dunes, and dense woods and provides pond and marsh views and beach access. • Province Lands Bicycle Trail—5.45 miles long; a hilly loop beginning at Province Lands Visitor Center; trail spurs to Herring Cove, Race Point, and Bennett Pond (API, 93; FCI, 0.000 (Good)). • Nauset Bicycle Trail—1.6 miles long (API, 81; FCI, 0.670 (Serious)); Nauset Bike Trail (boardwalk and bridge) (API, 93; FCI, 0.000 (Good)). • Head of the Meadow Bicycle Trail—2 miles long (API 67, FCI 0.002 (Poor)). <p>Trends</p> <ul style="list-style-type: none"> • Bicycle use is resurging in popularity. • Data collection regarding bicycle use is periodic. • Trail conditions must be monitored and maintained regularly due to the environment. • Numerous accidents and serious injuries have occurred due to excessive speed, failure to pay attention, and lack of adult supervision. • The challenging terrain on Province Lands Bicycle Trail is exacerbated by windblown sand.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Sand constantly blows or erodes onto paved bicycle trails. • There is not enough staffing for repeated routine maintenance such as sweeping and brushing. • Most visitor injuries in the park are on bicycle trails. • At-grade wildlife crossings present hazards to wildlife and riders. • Seasonal high water causes trail flooding and associated safety hazards. • Mixed uses create user conflicts. • Overuse results in crowding. • Invasive nonnatives and poison ivy are along edges of trails. • The bike trail bridge at Nauset Marsh is vulnerable to sea-level rise. • People often secure bicycles on trees if racks are not available. <p>Opportunities</p> <ul style="list-style-type: none"> • Trail maintenance strives for smooth asphalt surfaces, sand-free curves and hills, safe experiences for all levels of bicyclists, and safe road crossings. • The national seashore has partnered with the towns of Provincetown, Truro, and Wellfleet and the Cape Cod Commission on a regional bicycle/pedestrian trail network to focus on specific improvements and connections from the national seashore to the regional network. • Bicycle and multiuse paths are important for health and fitness options, reducing vehicle use, and providing pedestrian connectivity. Educational tours could be given by bicycle. • Bike safety education and bike rack storage improvements are needed to support this activity.

Other Important Resource or Value	Visitor Experience: Bicycle Trails
Stakeholders	<ul style="list-style-type: none"> • Cape Cod Commission • Outer Cape communities • State agencies • State and federal regulatory agencies • Bike shop owners • Landowners • Park visitors • Cape Cod Regional Transit Authority
Data and/or GIS Needs	<ul style="list-style-type: none"> • None identified.
Planning Needs	<ul style="list-style-type: none"> • None identified.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Architectural Barriers Act of 1968 • “Vehicles and Traffic Safety” (36 CFR 4) <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 8) “Use of the Parks” • NPS <i>Management Policies 2006</i> (chapter 9) “Park Facilities” • Director’s Order 42: <i>Accessibility for Visitors with Disabilities in National Park Service Programs and Services</i> • Director’s Order 50C: <i>Public Risk Management Program</i>



Other Important Resource or Value	Visitor Experience: Walking Trails and Picnic Areas
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • A trail condition inventory was completed in summer 2014. Many of the national seashore’s trails should be considered as complexes that include associated parking areas and restrooms. • Fort Hill Trail (API, 80; FCI, 0.068 (Good)) • Red Maple Swamp (currently closed awaiting rehabilitation) • Buttonbush • Nauset Marsh • Doane Trail / Picnic Area • Atlantic White Cedar • Great Island Trail (API, 72; FCI, 0.096 (Good)) / Picnic Area • Pamet • Woods Walk at the Highlands Center • Small’s Swamp • Pilgrim Spring • Beech Forest <p>Trends</p> <ul style="list-style-type: none"> • Funding for trail maintenance is not in the national seashore’s annual budget.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Erosion/storm runoff is the biggest factor in trail maintenance. • Bikes use walking trails. • Boardwalk degradation is the key problem with Red Maple Swamp Trail. • People often ignore prohibition of pets on the walking trails. • Social trails impact vegetation and disturb wildlife. • There is a lack of directional signs on several walking trails, including Great Island trails. • Ticks are an ongoing public safety concern. • Boardwalks are deteriorating due to difficult environmental conditions. <p>Opportunities</p> <ul style="list-style-type: none"> • The recently developed standard operating procedure for trail maintenance should be implemented. • Ecosystem management and use needs should be integrated when considering trail rehabilitation and expansion. • New media including GPS quests and tours should be explored. • Solitude is a desired trail experience, particularly in the off-season. • Walking trails and picnic areas provide areas for self-learning and access to national seashore meaning and values. • Exercise on national seashore trails is a means to a healthy park connection. • Improving accessible trails such as the Button Bush Trail and mobility improvements on other trails and walkways should be considered.

Other Important Resource or Value	Visitor Experience: Walking Trails and Picnic Areas
Stakeholders	<ul style="list-style-type: none"> • Friends of Cape Cod National Seashore • State agencies • Federal regulatory agencies • Town governments • Bicycle and walkways committees • Landowners • Town residents
Data and/or GIS Needs	<ul style="list-style-type: none"> • Trails inventory.
Planning Needs	<ul style="list-style-type: none"> • Trails management plan.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act • Architectural Barriers Act of 1968 <p>NPS Policy-level Guidance (NPS <i>Management Policies 2006</i> and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 9) "Park Facilities" • Director's Order 42: <i>Accessibility for Visitors with Disabilities in National Park Service Programs and Services</i> • Director's Order 50C: <i>Public Risk Management Program</i>



Identification of Key Issues and Associated Planning and Data Needs

This section considers key issues to be addressed in planning and management and therefore takes a broader view over the primary focus of part 1. A key issue focuses on a question that is important for a park. Key issues often raise questions regarding park purpose and significance and fundamental and other important resources and values. For example, a key issue may pertain to the potential for a fundamental or other important resource or value in a park to be detrimentally affected by discretionary management decisions. A key issue may also address crucial questions that are not directly related to purpose and significance, but that still affect them indirectly. Usually, a key issue is one that a future planning effort or data collection needs to address and requires a decision by NPS managers.

The following are key issues for Cape Cod National Seashore and the associated planning and data needs to address them:

Resource Management

- Shoreline change, sea level rise, and climate change have become a more important focus in recent years due to their effects on visitors, staff, and all resources and values.
- The sheer number and volume of structures, many of which are historic, and infrastructure in the seashore's harsh marine environment, coupled with funding limitations, make maintaining the national seashore's assets difficult.
- The Outer Cape is a dynamic, complex, and fragile coastal landscape that encompasses a wide range of terrestrial, estuarine, and marine resources. Understanding and evaluating the ecological integrity of this complex landscape requires persistent scientific research—including tracking populations and health conditions of natural systems, vegetation, coastal dunes, wetlands and ponds, wildlife, fish, salt marsh flora and fauna, eelgrass, and algal blooms—to inform management decisions.
- Increasing pressure for land development and improved recreational access, though carefully planned and evaluated on a case-by-case basis, raises concerns about the cumulative effect of these efforts both inside and outside the national seashore boundary on the larger landscape and ecosystem and overall visitor experience.

Visitor Experience

- The composition of visitation at Cape Cod National Seashore is changing with changing local demographics. Meeting the needs of visitors and residents while also broadening the greater visitor audience is important to ensure the relevance of the national seashore's resources and to encourage youth initiatives and diversity. Providing universal accessibility and mobility-enhanced facilities and programs is also necessary to meet the needs of current and future visitors.
- Visitor and resident population demographic trends and local industry shifts and contemporary changes in information technologies indicate significant changes in the national seashore's local constituency. Assessing the effects of these changes on uses and education preferences of visitors and residents is necessary to provide direction for adapting park management and programming.
- The national seashore needs a strategic public affairs plan for informing the public about the parks and its resources.



Operational, Facilities, and Overarching Issues

- Traffic congestion and auto emissions have a substantial effect on air quality in the region. Improving nonvehicular transportation access and public safety is an essential part of the national seashore’s Climate Friendly Parks’ greenhouse gas emission reduction and waste and energy conserving efforts.
- Cape Cod National Seashore continues to be a standard bearer for workplace safety and operational leadership. Sustaining a top-notch “safety first” culture is a high priority for national seashore management and staff.
- The national seashore must ensure that cost recovery and revenue potential of special park uses reflect contemporary commercial activities and effects on the operational budget.
- The national seashore should have a plan for managing and authorizing commercial uses that collect fees.
- The national seashore should have a building inventory and management plan with a schedule for routine, cyclic and more major repairs developed. The national seashore should have a right-of-way inventory and plan for managing rights-of-way.

Planning and Data Needs

To maintain connection to the core elements of the foundation and the importance of these core foundation elements, the planning and data needs listed here are directly related to protecting fundamental resources and values, park significance, and park purpose, as well as addressing key issues. To successfully undertake a planning effort, information from sources such as inventories, studies, research activities, and analyses may be required to provide adequate knowledge of park resources and visitor information. Such information sources have been identified as data needs. Geospatial mapping tasks and products are included in data needs.

Items considered of the utmost importance were identified as high priority, and other items identified, but not rising to the level of high priority, were listed as either medium- or low-priority needs. These priorities inform park management efforts to secure funding and support for planning projects.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	Planning Needs	Priority (H, M, L)	Notes
OIRV	Trails management plan	H	Designated trails require routine care. The many social trails in the national seashore damage vegetation and disturb wildlife, so this plan should identify trails as either acceptable or unacceptable based on resource impacts. Trails identified as unacceptable should be removed or closed.
FRV	Accessibility improvement plan (phased approach)	H	Many accessibility measures are needed to meet mandated requirements, and a phased, prioritized approach to provide universal access is needed. Accessibility plan for the Province Lands Visitor Center that addresses both physical and programmatic limitations should be included in the parkwide accessibility transition plan.
Key Issue	Building inventory and management plan	H	The national seashore’s assets should be inventoried and evaluated and a schedule for routine, cyclic and more major repairs developed. This plan should be continually updated.
FRV	Climate change adaptation plan / strategic plan	H	This plan should include cultural and natural resources and all facilities. It should also include a scenario planning component.
OIRV	Strategic plan for Atlantic Research and Learning Center	H	This plan would establish goals for expanding activities of the center.
FRV	Night skies / soundscapes plan	M	An integrated approach to night skies / soundscapes should consider impacts and solutions (may be location specific).
FRV	Visitor experience plan, including long-range interpretation (update)	M	This plan would address outreach to underserved audiences and the development of new audiences. It would also address visitor experience and interpretation.
FRV	Collections management plan (update)	M	This plan is needed to coordinate with other parks.
Key Issue	Public affairs plan	M	A public information function is integral to the activities in the national seashore. There is a need for a strategic look at messaging and public affairs.
FRV	Land protection plan (update)	M	The national seashore’s land protection plan was last formally updated in 1989, with minor updates since then. During the last decades, funding has decreased and priorities have shifted, and an updated plan is needed.
FRV	Visual resource management plan	M	This plan would develop a strategy for protecting key elements of important views.
FRV	Ponds management plan	M	Plan is needed to manage impacts of development, erosion, and public use.
FRV	Heathland and grassland habitats management plan	M	Plan is needed to manage adverse impacts.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	Planning Needs	Priority (H, M, L)	Notes
FRV	Sustainable golf course management plan for Highland Golf Links	M	Plan is needed to implement sustainable management practices.
FRV	Cultural landscape reports and treatment plans	M	Cultural landscape reports are needed for Pamet cranberry bog, Baker-Biddle Property, Truro Highlands Historic District, and Mid-Century Modern properties.
OIRV	Right-of-way plan and inventory	L	Many right-of-way permits are out of date. Because they provide little revenue and require a large expenditure of time to update, this inventory and plan require focus.
FRV	Parkwide lighting plan	L	Plan is needed to manage impacts from increase lighting, especially from commercial zones.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes
OIRV	Trails inventory	H	Necessary for undertaking trails management plan.
FRV	Plant and wildlife inventories	H	Cape Cod National Seashore lacks detailed inventories of many taxonomic groups that contribute to the national seashore's regionally significant biodiversity. These include freshwater marsh birds in both isolated and tidally restricted wetlands, milkweed-dependent butterflies and milkweed habitat, butterflies, moths, freshwater fish, freshwater invertebrates, rare plants, tiger beetles, and landbirds, especially rare bird species associated with grassland/heathland and pine barrens habitats, and fauna.
FRV	Study of meso-mammal population levels and ecology	H	Additional information on many aspects of meso-mammal ecology would inform shorebird management. These would include abundance and distribution, movements and home range, and food habits.
FRV	Shoreline vulnerability assessment	H	This assessment would include analysis of local tidal dynamics at inlets and the relationship between sea level rise / shoreline change and storms and waves. Threats to the Salt Pond Visitor Center due to its location inland of a vulnerable barrier spit would be analyzed. The vulnerability of assets and infrastructure to inundation and shoreline changes should be continuously evaluated.
FRV	Nutrient loading assessment	H	This assessment should focus on the nutrient dynamics of the seashore's coastal and freshwaters adjacent watershed nutrient inputs.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes
FRV, OIRV	National register documentation	H	National register documentation should be completed or updated for the Baker-Biddle Property, Penniman House, Old Harbor Lifesaving Station, Lighthouses (The Beacon, Race Point), and Nauset Archeological District.
FRV, OIRV	Historic structure reports	H	Historic structure reports should be prepared for properties under lease or that will be leased (Ahearn, Jedediah Higgins, Rider House, Kuhn Whitlock, Sirna, Kohlberg), Baker-Biddle property, Highland House, and coastal lifesaving heritage resources.
FRV	Accessibility assessment	H	This assessment should provide accessibility status for national seashore structures, landscape features, and interpretive programs for both visitors and employees with impairments to vision, hearing, mobility, or cognitive processes.
Key Issue	Commercial use authorization plan	H	Commercial uses that originate outside of the national seashore collect fees outside the national seashore. A comprehensive plan for these uses is needed to review activities and recommend updated approaches to their authorization and management.
FRV	Research on wetlands response to climate change and sea level rise	H	Research on impacts of climate change on salt marsh elevation, marsh and estuarine plant and animal communities, and management mitigation / adaptation / migration options for wetland losses.
FRV	Map and monitor seagrasses	H	This research would inform resource protection strategies.
FRV	Continue pre- and post-tidal restoration project ecological monitoring and hydrology modeling studies	H	This research would inform resource protection strategies.
FRV	Water-quality assessment	H	This would include nutrients, pharmaceuticals, and other land-derived chemicals and carbon dioxide-driven changes in ocean chemistry.
FRV	Detailed bathymetry and geological mapping of seafloor and benthic habitat	H	This research would inform resource protection strategies.
FRV	Compile, compare, and contrast resource changes in response to long-term deposition changes, particularly impacts on water resources such as freshwater kettle ponds	H	This research would inform policies for managing water deposition.
FRV	Alternative materials research for historic structures	H	Alternative materials research to consider the effectiveness and appropriateness of substituting alternative, more durable materials when rehabilitating historic structures.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes
FRV	Study of species occurrence and range shifts	M	Species ranges are shifting as a result of global factors such as climate change and regional factors such as the reforestation of southern New England.
FRV	Visual resource inventory	M	This inventory would support the visual resource management plan.
FRV	Catalog of existing research (all disciplines)	M	The Atlantic Research and Learning Center offers the opportunity to be a clearinghouse and serve as a catalyst for attracting research on natural and cultural resource subjects of interest to national seashore management. Research priorities should be identified so that new researchers could determine which projects are important to the national seashore.
FRV, OIRV	Cultural landscape inventories	M	Cultural landscape inventories are needed for Pamet cranberry bog, Baker-Biddle Property, Mid-Century Modern properties, Nauset Light properties, and Long Point.
FRV, OIRV	Historic American Buildings Survey documentation	M	The architecture of all historic properties should be identified in case they are destroyed, including coastal lifesaving heritage resources, dune shacks, and Mid-Century Modern properties.
FRV	Depositional impact study for water resources	M	A project is needed to compile, compare, and contrast resource changes in response to deposition changes, particularly water resources such as freshwater kettle ponds.
FRV	Mapping and monitoring shorebird feeding and nesting and roosting/staging habitats and substrate type	M	This research would inform resources protection strategies.
FRV	Research on influence of crab-herbivory and bioturbation on salt marshes experiencing dieback	M	This research would inform resource protection strategies.
FRV	Evaluate potential impacts of estuarine aquaculture and oyster reef restoration on water quality, habitat, and ecosystems	M	This research would inform resource protection strategies.
FRV	Monitor and evaluate water quantity and quality and their relationship to climate change	M	Important to understand impact of climate change on water quality and quantity.
FRV	Monitor human impacts on freshwater ponds	M	This research would inform resource protection strategies.
FRV	Continue monitoring atmospheric deposition as a source of excess nutrients	M	This research would inform resource protection strategies.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes
FRV	Nearshore invertebrate survey	M	This research would inform resource protection strategies.
FRV	Research on seal population on the Outer Cape, including diet, feeding, bacteria, sharks and trophic cascades	M	This research would inform resource protection strategies.
FRV	Update quantitative analysis of long-term trends in heathland and grassland habitats	M	This research would inform resource protection strategies.
FRV	Update inventory and assessment of invasive plant impacts and management needs	M	This research would inform resource protection strategies.
FRV	Monitor inter moth / gypsy moth / pine beetle population dynamics and their effects on forest dynamics and succession	M	This research would inform resource protection strategies.
FRV	Assessment of community structure and food web changes in response to climate change	M	This research would inform resource protection strategies.
FRV	Studies of air pollution impacts on sensitive park ecosystems	M	The effects of mercury and other toxic air pollutants on national seashore biota such as bird, bat, insect, and fish species would be studied.
FRV	In-depth study of species and species groups including predators such as coyote, fisher, red fox, crows, and bats	M	This research would inform managing predator populations.
FRV, OIRV	Updated List of Classified Structures condition assessments	M	Updated condition assessments are needed for the coastal lifesaving heritage sites, dune shacks, and Mid-Century Modern houses. The updated condition assessment will help with leasing estimates for 14 dune shacks.
FRV	Monitoring and evaluation of foot traffic in Dune Shacks historic district	M	This effort would focus on the interface between visitors and dune shack dwellers to consider the user experience and visitor capacity.
FRV	Additional archeological surveys	M	These surveys would be done to understand temporal and spatial dimensions of archeological resources.
FRV	Predictive modeling or archeological sites (e.g., Great Island)	M	Potential for archeological discoveries.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes
FRV	Analysis of wastewater management	M	This would inform wastewater management plan.
FRV	Research on marine life (shark/seals) on human interaction and public safety	M	This would help inform visitor management.
OIRV	Expanded archeological survey for Baker-Biddle property	M	Potential for archeological discoveries.
FRV	Oral history	L	This would include an oral history with members of the Baker-Biddle family.
FRV	Submerged archeological survey	L	Potential for archeological discoveries.
FRV	Periodic night sky monitoring by NPS Night Sky Team	L	This research would inform policies to mitigate lighting impacts on night sky.
FRV	Update floral inventory, particularly of rare species	L	This research would inform resource protection strategies.
FRV	Evaluate restoration of red maple swamp hydrology by removing (filling in) drainage ditches	L	This research would inform resource protection strategies.
FRV	Document and study species invasions	L	
FRV	Baseline inventory and habitat use of tiger beetles on Chatham beaches	L	This research would inform resource protection strategies.



Part 3: Contributors

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Appendixes

Appendix A: Enabling Legislation for Cape Cod National Seashore

Public Law 87-126

August 7, 1961
[S. 857]

AN ACT

To provide for the establishment of Cape Cod National Seashore.

Cape Cod Na-
tional Seashore,
Mass.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) the area comprising that portion of the land and waters located in the towns of Provincetown, Truro, Wellfleet, Eastham, Orleans, and Chatham in the Commonwealth of Massachusetts, and described in subsection (b), is designated for establishment as Cape Cod National Seashore (hereinafter referred to as “the seashore”).

(b) The area referred to in subsection (a) is described as follows:

Beginning at a point in the Atlantic Ocean one-quarter of a mile due west of the mean low-water line of the Atlantic Ocean on Cape Cod at the westernmost extremity of Race Point, Provincetown, Massachusetts;

thence from the point of beginning along a line a quarter of a mile offshore of and parallel to the mean low-water line of the Atlantic Ocean, Cape Cod Bay, and Provincetown Harbor in generally southerly, easterly, and northerly directions rounding Long Point and then southwesterly to a point a quarter of a mile offshore of the mean low-water line on the harbor side of the dike depicted on the United States Geological Survey Provincetown quadrangle sheet (1949) crossing an arm of the Provincetown Harbor;

thence northerly, along a line a quarter of a mile offshore of and parallel to the low-water line at the dike to a point easterly of the point of intersection of the said dike with the boundary of the Province Lands Reservation as depicted on the said Provincetown quadrangle sheet;

thence westerly to the said point of intersection of the dike and the Province Lands Reservation boundary;

thence along the boundaries of the Province Lands Reservation northwesterly, northeasterly, northerly, and easterly to the easternmost corner of the reservation being near United States Route 6;

thence leaving the said easternmost corner along an extension of the southerly reservation boundary line easterly to the northerly right-of-way line of United States Route 6;

thence along the northerly right-of-way line of United States Route 6 in a general easterly direction crossing the Truro-Provincetown line and continuing in the town of Truro in a generally southeasterly direction to a point four-tenths of a mile southeasterly of the southerly right-of-way line of Highland Road;

thence easterly five-tenths of a mile to a point;

thence turning and running in a southeasterly direction paralleling the general alinement of United States Route 6 and generally distant therefrom five-tenths of a mile to a point approximately 700 feet northwesterly of Long Nook Road;

thence southwesterly along a ridge generally paralleling the alinement of Long Nook Road and distant approximately 700 feet therefrom to a point two-tenths of a mile northeasterly of the northerly right-of-way line of United States Route 6;

thence southeasterly paralleling the general alinement of United States Route 6 and generally distant two-tenths of a mile northeasterly thereof to a point 300 feet south of the southerly right-of-way line of Higgins Hollow Road;

thence in a general easterly direction paralleling the southerly alignment of Higgins Hollow Road and 300 feet distant southerly therefrom to a point five-tenths of a mile east of the easterly right-of-way line of said Route 6;

thence turning and running in a southeasterly and southerly direction paralleling the general alignment of United States Route 6 and distant five-tenths of a mile easterly therefrom to a point 300 feet north of the northerly right-of-way line of North Pamet Road;

thence in a generally southwesterly direction paralleling the general alignment of North Pamet Road and generally distant 300 feet northerly therefrom to a point approximately two-tenths of a mile east of the easterly right-of-way line of United States Route 6;

thence in a southerly direction paralleling the alignment of United States Route 6 and generally distant two-tenths of a mile easterly therefrom to a point three-tenths of a mile south of South Pamet Road;

thence west to the intersection of Old County Road and Mill Pond Road;

thence following the easterly right-of-way line of Old County Road southward to a point opposite the southerly right-of-way line of Ryder Beach Road at its intersection with Old County Road;

thence eastward to a point 300 feet east of the easterly right-of-way line of said Old County Road;

thence in a southerly direction paralleling Old County Road at a distance of 300 feet to the east of the easterly right-of-way line of said road to a point 600 feet south of the southerly right-of-way line of Prince Valley Road;

thence in a generally westerly direction, crossing Old County Road and the New York, New Haven, and Hartford Railroad right-of-way to the southern extremity of the town landing and beach in the Ryder Beach area, and continuing to a point in Cape Cod Bay a quarter of a mile offshore from the mean low-water line of Cape Cod Bay;

thence turning and running along a line a quarter of a mile offshore of and parallel to the mean low-water line of Cape Cod Bay in a general southerly and easterly direction rounding Jeremy Point and thence in a general northerly direction along a line a quarter of a mile offshore of and parallel to the mean low-water line on the westerly side of Wellfleet Harbor, to a point one quarter of a mile due north of the mean low-water line at the eastern tip of Great Island as depicted on the United States Geological Survey Wellfleet quadrangle sheet (1958);

thence north to the mean high-water line on the north shore of the Herring River estuary in the vicinity of its confluence with Wellfleet Harbor;

thence following the mean high-water line southwesterly, northwesterly, and northeasterly to the easterly right-of-way line of Chequesset Neck Road at its crossing of Herring River;

thence following the course of Herring River along the 20-foot contour line of the southeasterly shore thereof to a point near Mill Creek;

thence crossing Mill Creek in a northeasterly direction to the 20-foot contour level near to and northeast of the confluence of Mill Creek and Herring River;

thence following generally northerly and easterly along the easterly edge of the Herring River marshes on the 20-foot contour

to a point north of which the easterly right-of-way line of a medium duty road, as depicted on said Wellfleet quadrangle sheet, crosses northward across a marshy stream near the juncture of said medium duty road with Bound Brook Island Road;

thence crossing said marshy stream along said easterly right-of-way line of said medium duty road, and continuing in a northerly direction to the 20-foot contour level on the north side of said marshy stream;

thence following the 20-foot contour line westward approximately 1,000 feet to its intersection with an unimproved dirt road, as depicted on said Wellfleet quadrangle sheet, leading from a point near the juncture of Bound Brook Island Road and the said medium duty road;

thence following said unimproved dirt road northwesterly for approximately 1,600 feet to the 20-foot contour line bordering the southerly edge of the Herring River marshes;

thence following said 20-foot contour line in an easterly direction to Route 6;

thence crossing Route 6 and continuing to a point on the easterly right-of-way line of a power transmission line as depicted on said Wellfleet quadrangle sheet;

thence in a general southerly direction along the said easterly right-of-way line of a power transmission line to the Eastham-Wellfleet town line;

thence southeasterly for a distance of approximately 5,200 feet to a point due north of the intersection of the easterly right-of-way line of Nauset Road with the northerly right-of-way line of Cable Road;

thence due south to the intersection of the said easterly right-of-way line of Nauset Road and the said northerly right-of-way line of Cable Road;

thence in a general southerly direction crossing Cable Road and along said easterly right-of-way line of Nauset Road to a point 500 feet north of the northerly right-of-way line of Doane Road and its intersection with Nauset Road;

thence west to a point 500 feet west of the westerly right-of-way line of Nauset Road;

thence southerly and westerly 500 feet from and parallel to the said right-of-way line of Nauset Road to the easterly right-of-way line of Salt Pond Road;

thence southerly along the easterly right-of-way line of said Salt Pond Road to its intersection with the southerly right-of-way line of Nauset Road;

thence westerly along the southerly right-of-way line of Nauset Road to its intersection with the easterly right-of-way line of United States Route 6;

thence southerly along the easterly right-of-way line of said Route 6 a distance of about four-tenths of a mile to the northerly boundary of the Eastham town hall property;

thence easterly to a point one-tenth of a mile from United States Route 6;

thence turning and running in a generally southerly direction paralleling the general alinement of United States Route 6 and generally distant therefrom one-tenth of a mile to a small stream approximately one-tenth of a mile beyond Governor Prence Road extended;

thence southeasterly along the said stream to the Orleans-Eastham town line;

thence along the Orleans-Eastham town line to the southerly tip of Stony Island;

thence generally southeasterly in the town of Orleans by Nauset Harbor Channel to a point due north of the northerly tip of Nauset Heights as depicted on United States Geological Survey Orleans quadrangle sheet (1946);

thence due south to the 20-foot contour line in Nauset Heights as delineated on the said Orleans quadrangle sheet;

thence generally southerly along the said 20-foot contour to a point about one-tenth of a mile northerly of Beach Road;

thence southwesterly along a line intersecting Beach Road at a point two-tenths of a mile easterly of the so-called Nauset Road leading northerly to Nauset Heights;

thence southerly to a head of a tributary to Little Pleasant Bay at the northerly tip of Pochet Neck as depicted on the said Orleans quadrangle sheet;

thence generally southerly along the thread of channel of the said tributary passing westerly and southwesterly around Pochet Island and thence southwesterly into Little Pleasant Bay passing to westerly of the northerly tip of Sampson Island, the westerly tip of Money Head, and the southwesterly tip of Hog Island following in general the centerline of Little Pleasant Bay to Pleasant Bay;

thence generally southeasterly in Pleasant Bay along a line passing midway between Sipson Island and Nauset Beach to a point on the Chatham-Orleans town line one-quarter of a mile westerly of the mean low-water line of Pleasant Bay on the westerly shore of Nauset Beach;

thence generally southerly in Pleasant Bay in the town of Chatham along a line a quarter of a mile offshore of and parallel to the said mean low-water line of Pleasant Bay on the westerly shore of Nauset Beach to a point a quarter of a mile south of the mean low-water line of the southern tip of Nauset Beach;

thence easterly rounding the southern tip of Nauset Beach along a line a quarter of a mile offshore of and parallel thereto;

thence generally northerly and northwesterly, and westerly along a line a quarter of a mile offshore of and parallel to the mean low-water line of the Atlantic Ocean on the easterly shore of Nauset Beach and on to the outer cape to the point of beginning.

SEC. 2. (a) The Secretary of the Interior (hereinafter referred to as "Secretary") is authorized to acquire by purchase, gift, condemnation, transfer from any Federal agency, exchange, or otherwise, the land, waters, and other property, and improvements thereon and any interest therein, within the area which is described in section 1 of this Act or which lies within the boundaries of the seashore as described pursuant to section 3 of this Act (both together hereinafter in this Act referred to as "such area"). Any property, or interest therein, owned by the Commonwealth of Massachusetts, by any of the towns referred to in section 1 of this Act, or by any other political subdivision of said Commonwealth 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 this Act.

(b) The Secretary is authorized (1) to use donated and appropriated funds in making acquisitions under this Act, and (2) to pay

Acquisition of
land, etc.
Authority.

Funds.

therefor not more than the fair market value of any acquisitions which he makes by purchase under this Act.

(c) In exercising his authority to acquire property by exchange, the Secretary may accept title to any non-Federal property located within such area and convey to the grantor of such property any federally owned property under the jurisdiction of the Secretary within such area. The properties so exchanged shall be approximately equal in fair market value: *Provided*, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize the values of the properties exchanged.

Report to Congress.

The Secretary shall report to the Congress on every exchange carried out under authority of this Act within thirty days from its consummation, and each such report shall include a statement of the fair market values of the properties involved and of any cash equalization payment made or received.

"Fair market value."

(d) As used in this Act the term "fair market value" shall mean the fair market value as determined by the Secretary, who may in his discretion base his determination on an independent appraisal obtained by him.

Notice. Publication in F. R.

SEC. 3. (a) As soon as practicable after the date of enactment of this Act and following the acquisition by the Secretary of an acreage in the area described in section 1 of this Act that is in the opinion of the Secretary efficiently administrable to carry out the purposes of this Act, the Secretary shall establish Cape Cod National Seashore by the publication of notice thereof in the Federal Register.

(b) Such notice referred to in subsection (a) of this section shall contain a detailed description of the boundaries of the seashore which shall encompass an area as nearly as practicable identical to the area described in section 1 of this Act. The Secretary shall forthwith after the date of publication of such notice in the Federal Register (1) send a copy of such notice, together with a map showing such boundaries, by registered or certified mail to the Governor of the Commonwealth of Massachusetts and to the board of selectmen of each of the towns referred to in section 1 of this Act; (2) cause a copy of such notice and map to be published in one or more newspapers which circulate in each of such towns; and (3) cause a certified copy of such notice, a copy of such map, and a copy of this Act to be recorded at the registry of deeds for Barnstable County, Massachusetts.

Acquisition by condemnation. Provisions.

SEC. 4. (a) (1) The beneficial owner or owners, not being a corporation, of a freehold interest in improved property which the Secretary acquires by condemnation may elect, as a condition to such acquisition, to retain the right of use and occupancy of the said property for noncommercial residential purposes for a term of twenty-five years, or for such lesser time as the said owner or owners may elect at the time of such acquisition.

(2) The beneficial owner or owners, not being a corporation, of a freehold estate in improved property which property the Secretary acquires by condemnation, who held, on September 1, 1959, with respect to such property, an estate of the same nature and quality, may elect, as an alternative and not in addition to whatever right of election he or they might have under paragraph (1) of this subsection, to retain the right of use and occupancy of the said property for noncommercial residential purposes (i) for a term limited by the nature and quality of his or their said estate, if his or their said estate is a life estate or an estate pur autre vie, or (ii) for a term ending at the death of such owner or owners, or at the death of the survivor of them, if his or their said estate is an estate of fee simple.

(3) Where such property is held by a natural person or persons for his or their own life or lives or for the life or lives of another

or others (such person or persons being hereinafter called "the life tenant"), with remainder in another or others, any right of election provided for in paragraph (2) of this subsection shall be exercised by the life tenant, and any right of election provided for in paragraph (1) of this subsection shall be exercised by the concurrence of the life tenant and the remainderman or remaindermen.

"The life tenant."

(4) The beneficial owner or owners of a term of years in improved property which the Secretary acquires by condemnation may elect, as a condition to such acquisition, to retain the right of use and occupancy of the said property for noncommercial residential purposes for a term not to exceed the remainder of his or their said term of years, or a term of twenty-five years, whichever shall be the lesser. The owner or owners of the freehold estate or estates in such property may, subject to the right provided for in the preceding sentence, exercise such right or rights of election as remain to them under paragraphs (1) and (2) of this subsection.

(5) No right of election accorded by paragraphs (1), (2), or (4) of this subsection shall be exercised to impair substantially the interests of holders of encumbrances, liens, assessments, or other charges upon or against the property.

(6) Any right or rights of use and occupancy retained pursuant to paragraphs (1), (2), and (4) of this subsection shall be held to run with the land, and may be freely transferred and assigned.

(7) In any case where a right of use and occupancy for life or for a fixed term of years is retained as provided in paragraph (1), (2), or (4) of this subsection, the compensation paid by the Secretary for the property shall not exceed the fair market value of the property on the date of its acquisition by the Secretary, less the fair market value on such date of the said right retained.

(8) The Secretary shall have authority to terminate any right of use and occupancy of property, retained as provided in paragraph (1), (2), or (4) of this subsection, at any time after the date when any use occurs with respect to such property which fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in regulations issued pursuant to section 5 of this Act and in effect on said date: *Provided*, That no use which is in conformity with the provisions of a zoning bylaw approved in accordance with said section 5 which is in force and applicable to such property shall be held to fail to conform or be opposed to or inconsistent with any such standard. In the event that the Secretary exercises the authority conferred by this paragraph, he shall pay to the owner of the right so terminated an amount equal to the fair market value of the portion of said right which remained on the date of termination.

Violation of regulations.

(b) (1) The Secretary's authority to acquire property by condemnation shall be suspended with respect to all improved property located within such area in all of the towns referred to in section 1 of this Act for one year following the date of its enactment.

Suspension of authority.

(2) Thereafter such authority shall be suspended with respect to all improved property located within such area in any one of such towns during all times when such town shall have in force and applicable to such property a duly adopted, valid zoning bylaw approved by the Secretary in accordance with the provisions of section 5 of this Act.

(c) The Secretary's authority to acquire property by condemnation shall be suspended with respect to any particular property which is used for commercial or industrial purposes during any periods when such use is permitted by the Secretary and during the pendency of the first application for such permission made to the Secretary after

the date of enactment of this Act provided such application is made not later than the date of establishment of the seashore.

“Improved property.”

(d) The term “improved property,” wherever used in this Act, shall mean a detached, one-family dwelling the construction of which was begun before September 1, 1959 (hereinafter referred to as “dwelling”), together with so much of the land on which the dwelling is situated, the said land being in the same ownership as the dwelling, as the Secretary shall designate to be reasonably necessary for the enjoyment of the dwelling for the sole purpose of noncommercial residential use, together with any structures accessory to the dwelling which are situated on the land so designated. The amount of the land so designated shall in every case be at least three acres in area, or all of such lesser amount as may be held in the same ownership as the dwelling, and in making such designation the Secretary shall take into account the manner of noncommercial residential use in which the dwelling and land have customarily been enjoyed: *Provided, however,* That the Secretary may exclude from the land so designated any beach or waters, together with so much of the land adjoining such beach or waters as the Secretary may deem necessary for public access thereto.

(e) Nothing in this section or elsewhere in this Act shall be construed to prohibit the use of condemnation as a means of acquiring a clear and marketable title, free of any and all encumbrances.

Issuance of regulations.

SEC. 5. (a) As soon after the enactment of this Act as may be practicable, the Secretary shall issue regulations specifying standards for approval by him of zoning bylaws for purposes of section 4 of this Act. The Secretary may issue amended regulations specifying standards for approval by him of zoning bylaws whenever he shall consider such amended regulations to be desirable due to changed or unforeseen conditions.

Submission to Congress.

All regulations and amended regulations proposed to be issued under authority of the two preceding sentences of this subsection shall be submitted to the Congress and to the towns named in section 1 of this Act at least ninety calendar days (which ninety days, however, shall not include days on which either the House of Representatives or the Senate is not in session because of an adjournment of more than three calendar days to a day certain) before they become effective and the Secretary shall, before promulgating any such proposed regulations or amended regulations in final form, take due account of any suggestions for their modification which he may receive during said ninety-day period. All such regulations and amended regulations shall, both in their proposed form and in their final form, be published in the Federal Register.

Publication in F. R.

Zoning bylaws. Approval.

The Secretary shall approve any zoning bylaw and any amendment to any approved zoning bylaws submitted to him which conforms to the standards contained in the regulations in effect at the time of the adoption by the town of such bylaw or such amendment unless before the time of adoption he has submitted to the Congress and the towns and published in the Federal Register as aforesaid proposed amended regulations with which the bylaw or amendment would not be in conformity, in which case he may withhold his approval pending completion of the review and final publication provided for in this subsection and shall thereafter approve the bylaw or amendment only if it is in conformity with the amended regulations in their final form. Such approval shall not be withdrawn or revoked, nor shall its effect be altered for purposes of section 4 of this Act by issuance of any such amended regulations after the date of such approval, so long as such bylaw or such amendment remains in effect as approved.

(b) The standards specified in such regulations and amended regulations for approval of any zoning bylaw or zoning bylaw amendment shall contribute to the effect of (1) prohibiting the commercial and industrial use, other than any commercial or industrial use which is permitted by the Secretary, of all property within the boundaries of the seashore which is situated within the town adopting such bylaw; and (2) promoting the preservation and development, in accordance with the purposes of this Act, of the area comprising the seashore, by means of acreage, frontage, and setback requirements and other provisions which may be required by such regulations to be included in a zoning bylaw consistent with the laws of Massachusetts.

Special provisions.

(c) No zoning bylaw or amendment of a zoning bylaw shall be approved by the Secretary which (1) contains any provision which he may consider adverse to the preservation and development, in accordance with the purposes of this Act, of the area comprising the seashore, or (2) fails to have the effect of providing that the Secretary shall receive notice of any variance granted under and any exception made to the application of such bylaw or amendment.

(d) If any improved property with respect to which the Secretary's authority to acquire by condemnation has been suspended by reason of the adoption and approval, in accordance with the foregoing provisions of this section, of a zoning bylaw applicable to such property (hereinafter referred to as "such bylaw")—

(1) is made the subject of a variance under or an exception to such bylaw, which variance or exception fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in the regulations issued pursuant to this section and in effect at the time of the passage of such bylaw, or

(2) is property upon or with respect to which there occurs any use, commencing after the date of the publication by the Secretary of such regulations, which fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in such regulations (but no use which is in conformity with the provisions of such bylaw shall be held to fail to conform or be opposed to or inconsistent with any such standard), the Secretary may, at any time and in his discretion, terminate the suspension of his authority to acquire such improved property by condemnation: *Provided, however,* That the Secretary may agree with the owner or owners of such property to refrain from the exercise of the said authority during such time and upon such terms and conditions as the Secretary may deem to be in the best interests of the development and preservation of the seashore.

SEC. 6. The Secretary shall furnish to any party in interest requesting the same, a certificate indicating, with respect to any property located within the seashore as to which the Secretary's authority to acquire such property by condemnation has been suspended in accordance with the provisions of this Act, that such authority has been so suspended and the reasons therefor.

Certificate.

SEC. 7. (a) Except as otherwise provided in this Act, the property acquired by the Secretary under this Act shall be administered by the Secretary subject to the provisions of the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (39 Stat. 535), as amended and supplemented, and in accordance with laws of general application relating to the national park system as defined by the Act of August 8, 1953 (67 Stat. 496); except that authority otherwise available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of this Act.

Administration.

16 USC 1-4.

16 USC 1b-1d.

Protection and
development.

(b) (1) In order that the seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary may designate: *Provided*, That the Secretary may provide for the public enjoyment and understanding of the unique natural, historic, and scientific features of Cape Cod within the seashore by establishing such trails, observation points, and exhibits and providing such services as he may deem desirable for such public enjoyment and understanding: *Provided further*, That the Secretary may develop for appropriate public uses such portions of the seashore as he deems especially adaptable for camping, swimming, boating, sailing, hunting, fishing, the appreciation of historic sites and structures and natural features of Cape Cod, and other activities of similar nature.

(2) In developing the seashore the Secretary shall provide public use areas in such places and manner as he determines will not diminish for its owners or occupants the value or enjoyment of any improved property located within the seashore.

Hunting and
fishing.
Regulations.

(c) The Secretary may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, State and Federal law. The Secretary shall consult with officials of the Commonwealth of Massachusetts and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations, and the Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that the Secretary shall leave all aspects of the propagation and taking of shellfish to the towns referred to in section 1 of this Act.

Navigation.

The Secretary shall not interfere with navigation of waters within the boundaries of the Cape Cod National Seashore by such means and in such areas as is now customary.

Cape Cod Na-
tional Seashore
Advisory Com-
mission.

SEC. 8. (a) There is hereby established a Cape Cod National Seashore Advisory Commission (hereinafter referred to as the "Commission"). Said Commission shall terminate ten years after the date the seashore is established under section 3 of this Act.

Membership.

(b) The Commission shall be composed of ten members each appointed for a term of two years by the Secretary as follows:

(1) Six members to be appointed from recommendations made by each of the boards of selectmen of the towns referred to in the first section of this Act, one member from the recommendations made by each such board;

(2) One member to be appointed from recommendations of the county commissioners of Barnstable County, Commonwealth of Massachusetts;

(3) Two members to be appointed from recommendations of the Governor of the Commonwealth of Massachusetts; and

(4) One member to be designated by the Secretary.

(c) The Secretary shall designate one member to be Chairman. Any vacancy in the Commission shall be filled in the same manner in which the original appointment was made.

Compensation.

(d) A member of the Commission shall serve without compensation as such. The Secretary is authorized to pay the expenses reasonably incurred by the Commission in carrying out its responsibilities under this Act upon vouchers signed by the Chairman.

(e) The Commission established by this section shall act and advise by affirmative vote of a majority of the members thereof.

Duties.

(f) 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 Cape Cod National Seashore and shall consult with the members with respect to carrying out the provisions of sections 4 and 5 of this Act.

(g) No permit for the commercial or industrial use of property located within the seashore shall be issued by the Secretary, nor shall any public use area for recreational activity be established by the Secretary within the seashore, without the advice of the Commission, if such advice is submitted within a reasonable time after it is sought.

Exemptions.

(h) (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 subsection (2) of this section.

62 Stat. 697, 793.

(2) The exemption granted by subsection (1) of this section shall not extend—

(i) to the receipt or 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.

Sec. 9. There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act; except that no more than \$16,000,000 shall be appropriated for the acquisition of land and waters and improvements thereon, and interests therein, and incidental costs relating thereto, in accordance with the provisions of this Act.

Appropriation.

Sec. 10. If any provision of this Act or the application of such provision to any person or circumstance is held invalid, the remainder of this Act or the application of such provision to persons or circumstances other than those to which it is held invalid shall not be affected thereby.

Separability.

Approved August 7, 1961, 12:00 a. m.

Appendix B: Cape Cod National Seashore Land Coverage by Acreage

Land Cover Type	Acres*
Grassland	3,375
Heathland	895
Deciduous forest	3,765
Mixed pine forest	11,500
Wetlands and ponds	2,550
Salt marsh	1,875
Beach and tide flats	1,700
Developed land	1,150
Total upland acres	26,810
Total marine acres	17,190
Total acres	44,000

*Based on 2000 vegetation mapping.





Northeast Region Foundation Document Recommendation Cape Cod National Seashore

June 2018

This Foundation Document has been prepared as a collaborative effort between park and regional staff and is recommended for approval by the Northeast Regional Director.

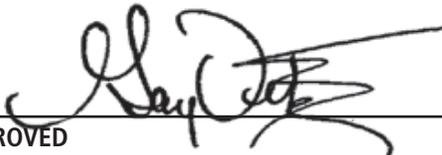


6.11.2018

RECOMMENDED

Brian T. Carlstrom, Superintendent, Cape Cod National Seashore

Date



July 2, 2018

APPROVED

Gay Vietzke, Regional Director, Northeast Region

Date



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

CACO 609/146736

July 2018

Foundation Document • Cape Cod National Seashore

