National Park Service
U.S. Department of the Interior

Cape Cod National Seashore
Massachusetts

Cape Cod National Seashore

Herring Cove Beach North Public Access Site Plan
Environmental Assessment

SEPTEMBER 2013

United States Department of the Interior
National Park Service

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September 2013

The National Park Service (NPS) proposes to develop a long-term plan for management of the deteriorating Herring Cove Beach North parking lot in a way that considers the potential for future erosion, sea level rise, coastal flooding during storm events, and long-term sustainability; that restores natural systems to the greatest extent possible; and that also retains the recreational experience to the greatest extent possible. Herring Cove Beach is of special concern to the residents and visitors of Provincetown, Massachusetts because it is the only remaining Provincetown beach with direct water view parking and car-to-sand access for people of all ages and abilities. Action is needed at this time because recent storms have damaged sections of the revetment and the parking lot. A long-term plan is needed to maintain values that have made it a local favorite for decades, ease of access to the beach and expansive views of Cape Cod Bay from the parking lot year-round.

The NPS prepared an Environmental Assessment (EA) to evaluate alternatives for the Herring Cove Beach North Public Access Site Plan, describe the environment that would be affected by the alternatives, and the environmental consequences of implementing the alternatives. Alternative C was identified as the NPS preferred alternative because it best meets the project purpose for managing the parking lot in a way that considers long-term sustainability, that restores the natural systems to the greatest extent possible, and that also retains the recreational experience to the greatest extent possible. Implementation of the NPS preferred alternative would result in impacts on coastal processes, vegetation, floodplains, public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure.

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Note to Reviewers and Respondents:
If you wish to comment on this EA, you may mail comments within 45 days to the name and address below or you may post them electronically at <www.parkplanning.nps.gov/caco>. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we would be able to do so.

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Wellfleet, MA 02667

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ACRONYMS AND ABBREVIATIONS

ACHP – Advisory Council on Historic Preservation
Advisory Commission – Cape Cod National Seashore Advisory Commission
CBI – Consensus Building Institute
CEQ – Council on Environmental Quality
CFR – Code of Federal Regulations
CZMA – Coastal Zone Management Act
DO – Director's Order
EA – environmental assessment
GMP – general management plan
Mass DEP – Massachusetts Department of Environmental Protection
MWPA – Massachusetts Wetland Protection Act
the national seashore – Cape Cod National Seashore
NEPA – National Environmental Policy Act
NHESP - Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program
NHPA – National Historic Preservation Act
NPS – National Park Service
PEPC – NPS Planning, Environment, and Public Comment system
SHPO – state historic preservation officer
Subcommittee – Herring Cove Subcommittee
THPO – Tribal Historic Preservation Officer
U.S. – United States
USACE – U.S. Army Corps of Engineers
USC – U.S. Code
USFWS – U.S. Fish and Wildlife Service
WPA – Massachusetts Wetlands Protection Act

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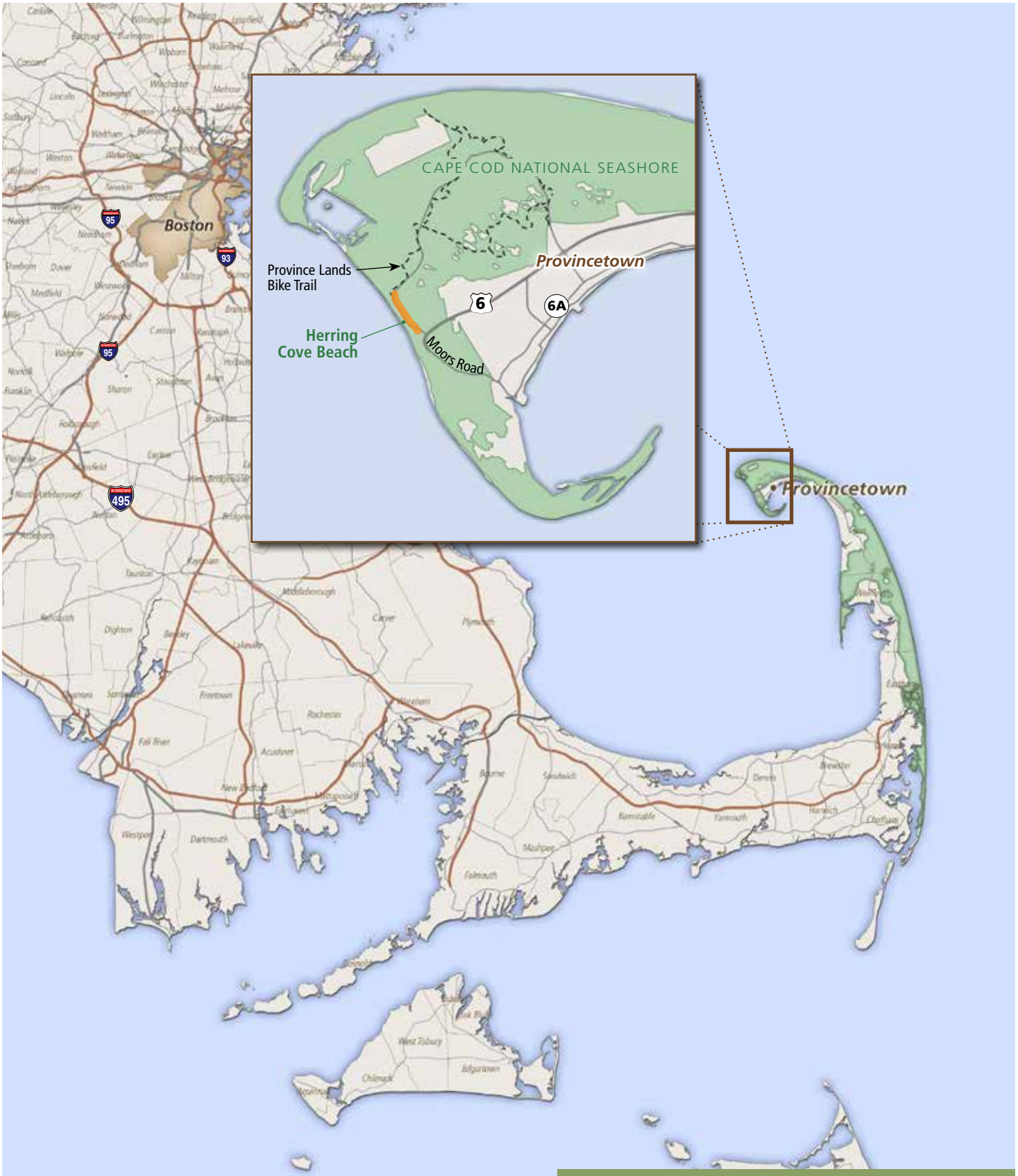
PURPOSE AND NEED

The National Park Service (NPS) proposes to develop a long-term plan for management of the deteriorating north parking lot in a way that considers the potential for future erosion, sea level rise, coastal flooding during storm events, and long-term sustainability; that restores natural systems to the greatest extent possible; and that also retains the recreational experience to the greatest extent possible.

This Environmental Assessment (EA) evaluates three alternatives: a no-action alternative and two action alternatives, including the NPS preferred alternative. The EA further analyzes the potential impacts these alternatives would have on the natural, cultural, and human environment. This document has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500-1508); and NPS Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making* (DO-12, 2011) and accompanying DO-12 Handbook (2001). An assessment of effect will be completed separately to comply with section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

This document also includes a Federal Consistency Determination, which describes how the proposed action complies with and would be conducted in a manner that is consistent with the Massachusetts Coastal Zone Management Program policies. As an action within the Massachusetts designated coastal zone, such a certification is required by the Coastal Zone Management Act (CZMA) of 1972, as amended. The Federal Consistency Determination for the proposed action is contained in appendix B of this EA.

Until this planning process is completed, short-term repairs and/or public safety detours may be implemented to insure safe public access to Herring Cove Beach.



Herring Cove Beach North Public Access Site Plan
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FIGURE 1
Project Location

PURPOSE OF AND NEED FOR ACTION

The purpose of taking action at this time is to develop a long-term plan for management of the Herring Cove North parking lot in a way that:

- retains the quality of recreational experience to the greatest extent possible
- restores natural systems to the greatest extent possible
- considers the potential for future erosion, sea level rise, coastal flooding during storm events, and long-term sustainability

The plan will be based upon sound coastal science and engineering practices, and will be responsive to shoreline change, projected sea level rise, and community and visitor recreational use.

The Herring Cove revetment crumbles into Cape Cod Bay during a December 2011 storm

Wave action in late December 2011 has broken up large sections of the asphalt revetment near the bathhouse and sections of the north parking lot, and caused damage to coastal areas near the south parking lot. The North parking lot has been previously damaged and continues to be directly threatened by erosion. Coastal geologists predict a continued average 2.5-foot annual erosion rate in the project area (this prediction is discussed in more detail under the "Coastal Processes" section of chapter 3) and the need to retreat facilities to a location immediately behind the recently replaced bathhouse by the end of this decade. Additionally, the existing infrastructure is impeding the natural sediment movement within the project area. During storm events, the sand from the backshore/dunes that would otherwise contribute to the nearshore sediment budget is stored out of reach of moderate storm events, on the eastern side of the parking lot. When the shoreline should be in a seasonal period of recovery, where sand moves onshore and is stored in dunes, some of this sand is lost to longshore currents instead, due to the separation of the vegetated dunes from the foreshore. This tends to accelerate rates of shoreline erosion. Long-standing NPS policy is to let coastal processes occur unimpeded and to adjust facilities accordingly. Therefore, there is a need to develop a long-term solution to maintain or enhance the shoreline's environmental integrity through restoration of natural coastal processes while maintaining safe beach access.

The Herring Cove North parking lot is the only area in the national seashore's north district that has an unobstructed view of the water (Cape Cod Bay) from the parking lot. Although its proximity to the beach causes natural resource and structural issues, this proximity means that the lifeguarded beach is highly accessible for all visitors, including those with limited mobility. The parking lot offers opportunities for whale watching in the spring, and because of its westerly aspect, it also offers an opportunity to watch the sunset over the water year-round. The parking lot is so popular that during the summer months the lot often fills to capacity by mid-day. Therefore, there is a need to incorporate ease of access to the Herring Cove Beach and waterview parking as part of the proposed action.

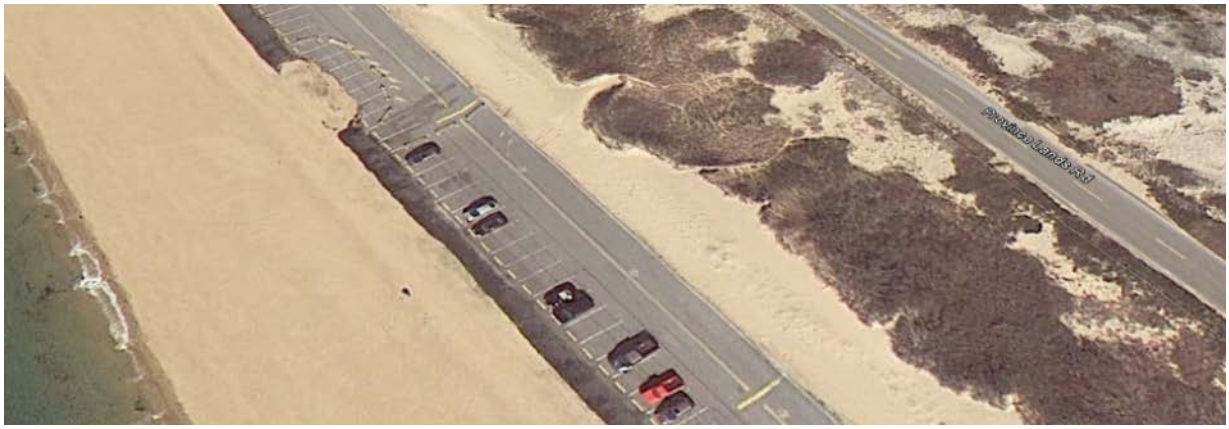
The objective of the proposed action is to:

- maintain to the extent practical community and visitor values associated with the Herring Cove Beach experience, including a high degree of accessibility and opportunities to view the water from their vehicles
- preserve the existing visitor experience and community values while being responsive to coastal processes, shoreline change, and commonwealth and federal policies
- manage national seashore facilities based on coastal science and engineering best practices, anticipated sea level rise that is predicted to accelerate, and sustainability efforts

PROJECT AREA DESCRIPTION

The Herring Cove Beach is located at the intersection of Province Lands Road and Moors Road, at the terminus of U.S. Highway 6, in the national seashore's north district at the northern tip of the Cape, about a mile from Provincetown. The project area includes approximately one mile of shoreline from the north Herring Cove parking lot to in front of the Herring Cove Beach bathhouse and Herring Cove Beach South parking lot. The project area extends from the shoreline to approximately 400 feet inland to Province Lands Road and its environs (figure 2). The following items are included in the project area:

- Herring Cove North parking lot
- 1 mile macadam revetment (seawall), extending south from the Herring Cove North parking lot
- vault toilet at the north end of parking lot
- fee booth at the south end of the parking lot
- Province Lands Road
- bicycle trail connection (between Moors Road and the Province Lands Bicycle Trail)
- surrounding dunes



GoogleEarth view of a portion of Herring Cove North parking lot, showing where pavement damage had caused a closure of a portion of the parking lot. Province Lands Road can be seen inland. Imagery copyright 2013. Image date March 11, 2012.

NORTH

0 300 600 Feet

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MOORS ROAD

NEW HERRING COVE BATHHOUSE FACILITIES

PROVINCE LANDS ROAD

FEE BOOTH

SOUTH PARKING AREA

VAULT TOILET

NORTH PARKING AREA

BEACH

REVETMENT

REVETMENT

REVETMENT

REVETMENT

BICYCLE ROUTE

APPROXIMATE SHORELINE

AREA OF POTENTIAL EFFECT

BIKE ROUTE/LANES

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FIGURE 2

Project Area/Area of Potential Effect

BACKGROUND AND HISTORY OF THE HERRING COVE BEACH AREA

Cape Cod National Seashore (the national seashore) occupies more than 44,000 acres of the eastern shores of Cape Cod, an arm of land extending 70 miles into the Atlantic Ocean, approximately 100 miles southeast of Boston (figure 1). The national seashore was established in 1961 to "preserve the nationally significant and special cultural and natural features … that characterize the Outer Cape, along with the associated scenic … and recreational values" (NPS 1998). The towns of Chatham, Orleans, Eastham, Wellfleet, Truro, and Provincetown are located on Cape Cod and are, in some cases, surrounded by national seashore land.

Herring Cove was part of the Province Lands, a common lands purchased from the Native Americans by the Pilgrims in 1654. Though Herring Cove was a fishing settlement in the 1800s, the Province Lands remained undeveloped for nearly 300 years. In the 1920s, Massachusetts constructed a paved road through the area, including a coast road along Herring Cove's spine. This new road gave access to "New Beach." Bathers discovered the warm, calm water of Cape Cod Bay. By contrast, the Cape's east-facing Great Beach was slower to develop because of its surf and cold water. Provincetown's rise as an art colony and tourist destination coincided with the reinvention of Herring Cove in the early 20th century.

The Commonwealth of Massachusetts developed the Herring Cove Beach facilities in the 1950s. These facilities include: a 1-mile macadam revetment (seawall), two parking lots with an estimated 800 total spaces, and a bathhouse and concession stand (both of which were recently replaced). The old bathhouse was the commonwealth's first and boasted a staff that included an onsite manager, clerk matron, three check room and two bathhouse attendants, two porters, and three lifeguards. The north parking lot was an ad-hoc creation from an old roadway and has been subject to damage from recent storms due to its proximity to the shoreline. By 1956, alarming beach erosion impacted Herring Cove Beach as a result of the commonwealth removing dune to provide better views of the water. The commonwealth armored long stretches of shore with asphalt aprons/revetments built to a depth below sea level to stem the tide of erosion. Small stone groins were installed to collect sand in front of the bathhouse. The revetment and groins offered some measure of protection in the immediate area but starved other areas farther down the beach.

Thanks in large part to the Emergency Committee for the Protection of the Province Lands formed in the late 1950s, the commonwealth handed over the Province Lands in their entirety to the National Park Service in 1962. The NPS renamed the facility Herring Cove and built additional revetments in 1965 in a renewed effort to slow erosion. Despite damage caused by erosion, Herring Cove has remained a popular destination. Over 850,000 people visit annually, including many who come for the unparalleled views of Cape Cod Bay directly from the parking lot.

Herring Cove Beach is of special concern to the residents and visitors of Provincetown, Massachusetts because it is the only remaining Provincetown beach with direct water view parking and car-to-sand access for people of all ages and abilities. It is one of six life-guarded beaches managed by the national seashore. With about 600 parking spaces, Herring Cove Beach can usually accommodate all visitors.

PREVIOUS AND RELATED PLANNING STUDIES

Several plans and studies have informed and contributed to the development of alternatives for public access to Herring Cove Beach. These include the *Cape Cod National Seashore General Management Plan* (GMP) (NPS 1998) and the *Rehabilitation of Moors Road with Bicycle Accommodations in the Province Lands Environmental Assessment/Assessment of Effect* (NPS 2010b).

The ***Cape Cod National Seashore General Management Plan*** (NPS 1998) lays out the overall goals for the national seashore: 1) preserve national seashore resources, 2) provide for the public enjoyment and visitor experience of the national seashore, 3) ensure organizational effectiveness, and 4) strengthen and preserve natural and cultural resources and enhance recreational opportunities through partnerships. With regard to Herring Cove Beach, the *General Management Plan* specified that "The maintenance of developed facilities and hardened surfaces in stable coastal areas, such as Herring Cove Beach, will continue unless catastrophic damage occurs that requires capital replacement. At that time alternative design, siting, and management approaches will be developed in consultation with affected towns."

The ***Rehabilitation of Moors Road with Bicycle Accommodations in the Province Lands Environmental Assessment/Assessment of Effect*** was completed in May 2010. Moors Road (State Route 6A) travels approximately 1 mile through the north district of Cape Cod National Seashore and provides access to Provincetown, Herring Cove Beach, and the Province Lands Bicycle Trail. The NPS rehabilitated Moors Road through rehabilitation of the road's structure, widening of the road corridor for bicycle lanes on both sides of the road, and addition of crosswalks. The rehabilitation efforts improved visitor access to the Herring Cove Beach Area and encourages visitors to bike to Herring Cove Beach, thereby reducing the demand for parking.

SCOPING AND CONSULTATION

The national seashore collaborated with the Cape Cod National Seashore Advisory Commission (the Advisory Commission), its Herring Cove Subcommittee (the Subcommittee), and the Consensus Building Institute (CBI) to facilitate public involvement and develop a range of alternatives to be analyzed in the EA/AoE, as discussed in chapter 2 under the "Alternatives Development" section.

The national seashore involved the public in the planning process and solicited for public comment. Information on the project was made available through the national seashore website, its Planning, Environment, and Public Comment (PEPC) page, press releases and newsletters. A public meeting was also held to inform the public and begin the public comment period.

During scoping, the national seashore initiated consultation with agencies and tribes, including the USFWS, the Massachusetts Division of Fisheries and Wildlife, the Massachusetts SHPO, the Advisory Council on Historic Preservation (ACHP), and the THPOs for the Wampanoag Tribe of Gay Head-Aquinnah and the Mashpee Wampanoag Tribe.

For further scoping and public participation information, see "Chapter 5: Consultation and Coordination" and "Appendix A: Relevant Correspondence."

PLANNING ISSUES AND CONCERNS

During the scoping process, specific concerns were identified as critical to consider while planning how to best improve the Herring Cove Beach North public access facilities. Along with the purpose and need for the proposed action, these issues guided the development of alternatives and contributed to the identification of impact topics for analysis, as described below. The following common themes concerns and values for the site were identified within the comments received from public officials, local residents, and park visitors:

- Accessibility of the parking lot, beach and view
- Historic use and access to the beach
- Economic impacts (tourism)
- Natural resource protection
- Need for additional data to characterize year round use of the parking lot
- Safety of bicyclists using the bicycle path
- Concerns that National Park Service policies will prevent preserving community and visitor values

REGULATORY ISSUES AND MANAGEMENT CONCERNS

Prior to the implementation of the proposed action, the NPS would need to obtain appropriate local, commonwealth, and federal approval for some of the proposed activities. A list of permits, approvals, and regulatory requirements associated with the proposed action are as follows:

- Massachusetts National Pollution Discharge Elimination System General Permit from the Environmental Protection Agency
- Relevant Massachusetts Wetland Protection Act (MWPA) paperwork will need to be filed with the Provincetown Conservation Commission
- Programmatic General Permit Category I under Section 404 of the Clean Water Act for work below mean high water (revetment removal)
- A Water Quality Certification for work in Outstanding Resource Waters (314 CMR 9.04[2]) under Section 401 of the Clean Water Act (revetment removal), or MWPA Notice of Intent
- Federal consistency review under the Massachusetts Coastal Zone Management Program

These requirements are described further in “Chapter 5: Consultation and Coordination,” and the NPS Federal Consistency Certification is included in Appendix B.

IMPACT TOPICS RETAINED FOR ANALYSIS

Impact topics are resources of concern within the project area that could be affected, either beneficially or adversely, by the range of alternatives presented in this EA. They were identified based on the issues raised

during scoping; site conditions; federal laws, regulations, Executive Orders, NPS *Management Policies 2006* (NPS 2006), and Director's Orders; and staff knowledge of the national seashore's resources.

Impact topics identified and analyzed in this EA are listed below along with a brief rationale for the selection of each impact topic. They include coastal processes, vegetation, floodplains, public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure. Each impact topic is further discussed in detail in "Chapter 3: Affected Environment" of this document.

Coastal Processes. NPS *Management Policies 2006* states that the NPS will allow natural shoreline processes (such as erosion, deposition, dune formation, overwash, inlet formation, and shoreline migration) to continue naturally, without interference (NPS 2006a). The north Herring Cove parking lot is located within the dynamic coastal zone of the Province Lands, where coastal processes are the primary drivers of shoreline soils and topography. The proposed actions would include grading within the project area and has the potential to modify infrastructure embedded within the coastal system. Therefore, the impact topic of coastal processes is addressed.

Vegetation. Protection of naturally occurring vegetation communities is a goal of the NPS, as stated in the NPS *Management Policies 2006* (NPS 2006a). The project area includes approximately 1 mile of dune scrub vegetation and some sensitive heathland on the eastern side of Province Lands Road. The proposed actions could result in removal, displacement, and or disturbance of vegetation, some of which plays an important role in coastal processes. Therefore, the impact topic of vegetation is addressed.

Floodplains. Executive Order 11988, "Floodplain Management," and NPS DO-77-2: *Floodplain Management*, require an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. Due to its low elevation and proximity to the coast, western portions of the project area are within the area of 1% chance of annual coastal flood with velocity (wave action) with a base flood elevation of 14 feet (FEMA 2013). The proposed action would result in a change in topography that could affect the flow of floodwaters through the project area. Therefore, the impact topic of floodplains is addressed.

Public Use and Experience. Enjoyment of national seashore resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006a). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. The proposed action is meant to enhance the public use and experience, which encompasses interpretation, understanding, enjoyment, safety, circulation, and accessibility of the seashore. The proposed action would result in changes to public use and experience within the project area. Therefore, the impact topic of public use and experience is addressed.

Socioeconomic Resources and Adjacent Lands. The proposed action could result in temporary and long-term changes to the economics of the adjacent community of Provincetown. Additionally, members of the public were concerned about economic impacts during the scoping process. Therefore, the impact topic of socioeconomic resources and adjacent lands is addressed.

Operations and Infrastructure. Part of providing a quality experience for those visitors to and users of the national seashore is ensuring that infrastructure provides safe and efficient access to national seashore resources without overly burdening national seashore staff with needs such as maintenance. The proposed action would make infrastructure more resilient to climate change effects, unlike the current infrastructure

which experiences regular damage. Additionally, the proposed action could result in and altered layout of the parking lot for the Herring Cove North parking lot and a widening of Province Lands Road to accommodate bicycle traffic. Therefore, the impact topic of infrastructure and operations is addressed.

IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

Water Resources. NPS *Management Policies 2006* states that the NPS will "take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, commonwealth, and local laws and regulations" (NPS 2006). The project area is located on the shoreline of Cape Cod Bay. The waters surrounding Cape Cod National Seashore have been designated as Outstanding Resource Waters due to their outstanding socioeconomic, recreational, ecological, and/or aesthetic values. The proposed action may require a Category I General Permit for work below mean low water; however, impacts on water quality would be less than minor. Therefore, the impact topic of water resources was consider but dismissed from further analysis.

Prime and Unique Farmland. Prime farmland is one of several designations made by the U.S. Department of Agriculture to identify important farmlands in the United States. It is important because it contributes to the nation's short- and long-range needs for food and fiber. The soils within this area are not classified as prime farmland. Therefore, the impact topic of prime and unique farmland was considered but dismissed from further analysis. Impacts to other soils are considered under "Coastal Processes."

Wetlands. Executive Order 11990, "Protection of Wetlands" and NPS DO-77-1: *Wetland Protection* require an examination of impacts on wetlands. According to a review of the USFWS National Wetland Inventory and confirmation by national seashore staff, wetland habitat within the area of proposed improvements is limited to the estuarine area along the shoreline. No work is proposed within this area. Therefore, the impact topic of wetlands was considered but dismissed from further analysis.

Special Status Species. The Endangered Species Act mandates that all federal agencies consider the potential impacts of their actions on species listed as threatened or endangered in order to protect the species and preserve their habitats. The USFWS Information, Planning, and Conservation decision support system is a conservation planning tool for streamlining the environmental review process. The national seashore staff has reviewed the species listed for Barnstable County, Massachusetts and has conducted a review of the project area for the presence of special status species or habitat.

Although a number of special status species are found throughout the national seashore, no federally threatened or endangered species or their critical habitat are known to exist within the area of proposed improvements. Further, to avoid potential impacts on special status species, no construction would occur between April 15 and August 30 to avoid the spadefoot toad breeding season and minimize activity during the box turtle active season. Although it would be unexpected, if any federally threatened or endangered species was encountered during construction activities, work would cease and consultation with the USFWS would resume. The NPS anticipates that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or

species currently proposed for listing under the Endangered Species Act. Therefore, the impact topic of special status species was considered but dismissed from further analysis.

Cultural Resources. In NPS DO-28: *Cultural Resource Management Guidelines*, cultural resources are categorized into cultural landscapes, historic structures, archeological resources, museum collections, and ethnographic resources. DO-28 lists aspects of each type of cultural resource which must be considered during the planning process. The first step for this plan was identifying the national seashore's cultural resources. As discussed below, no known cultural resources exist within the project area.

Archeological Resources. No archeological resources have been identified within the project area. Archaeological resources are not anticipated in this area due to the shifting nature of the sands in this area. The migrating of dunes and sand in this area is ongoing, thus somewhat unstable and likely not present in this form during pre-Contact or early Historic time. Although unlikely, if during construction previously undiscovered archeological resources were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the Massachusetts SHPO and the relevant tribes. Archeological resources is dismissed as an impact topic.

In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) would be followed.

Cultural Landscapes. The NPS defines a cultural landscape as a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person exhibiting other cultural or aesthetic values. There are four kinds of cultural landscapes, which are not mutually exclusive: historic site, historic designed landscape, historic vernacular landscape, and ethnographic landscape (NPS 2002). The project area does not include any such landscapes; therefore, the impact topic of cultural landscapes is dismissed from further analysis.

Historic Structures. A historic structure is defined by the NPS as "a constructed work, usually immovable by nature or design, consciously created to serve some human act" (NPS 2002). In order for a structure or building to be listed on or eligible for listing on the National Register, it must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. The National Register Bulletin #15: *How to Apply the National Register Criteria for Evaluation* (NPS 1990) provides a comprehensive discussion of these characteristics. There are no historic structures within the project area. Therefore, the impact topic of historic structures is dismissed from further analysis.

Ethnographic Resources and Sacred Sites. An ethnographic resource is defined as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 2002). There are no known ethnographic resources, including sacred sites, within the project area. Therefore, the impact topic of ethnographic resources and sacred sites was considered but dismissed from further analysis.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts on Indian Trust resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly

addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal laws with respect to Native American tribes. There are no known Indian Trust resources in the project area, and the lands comprising the national seashore are not held in trust by the secretary of the interior for the benefit of Indians due to their status as Indians. Therefore, the impact topic of Indian Trust resources was considered but dismissed from further analysis.

Museum Collections. A museum collection is an assemblage of objects, works of art, historic documents, and/or natural history specimens collected according to a rational scheme and maintained so that they can be preserved, studied, and interpreted for public benefit. The proposed action would not impact any museum collections in the project area. Therefore, the impact topic of museum collections was considered but dismissed from further analysis.

Climate Change. Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality, storm frequency, etc.) lasting for an extended period (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change provide clear evidence that climate change is occurring and will accelerate in the coming decades. There is strong evidence that global climate change is being driven by human activities worldwide, primarily the burning of fossil fuels and tropical deforestation. These activities release carbon dioxide and other heat-trapping gases, commonly called "greenhouse gases," into the atmosphere (IPCC 2007).

There are two aspects of climate change that must be considered in an environmental impact analysis:

- our impact on climate change: i.e., through our actions, the potential to increase or decrease emissions of greenhouse gases that contribute to climate change
- the impact of climate change on us: i.e., how are the resources that we manage likely to change in response to changing climate conditions, and how does that change or otherwise affect our management actions and the impacts of those actions on the resource

The most recent Cape Cod National Seashore greenhouse gas inventory was completed in 2010 using a Climate Friendly Parks Program's Climate Leadership in Parks tool. This identifies the national seashore's emissions as 1,288 Metric Tons of Carbon Dioxide Equivalent ($MTCO_2E$) for national seashore operations and 3,307 $MTCO_2E$ for gross national seashore emissions, which includes operations, concessions, permittees, and leasees (including Provincetown Municipal Airport), and estimated visitor transportation miles.

The NPS does not project either vehicle or bicycle demand to increase as a result of the alternatives. During the construction process, the proposed action could result in a temporary increase in emissions of greenhouse gases from the operation of construction vehicles. After construction, however, the project is not expected to increase or reduce the carbon footprint. Because the project would have no measurable impacts on climate change, it is dismissed as an impact topic for further analysis.

Environmental Justice. Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or

adverse human health or environmental effects of their programs and policies on minorities and low income populations and communities. According to the Environmental Protection Agency, environmental justice is the "…fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, commonwealth, local, and tribal programs and policies."

The goal of "fair treatment" is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts. Environmental justice is dismissed from further analysis for the following reasons:

- The national seashore staff and planning team solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the proposed action would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse impacts on any minority or low-income population.
- The impacts associated with implementation of the proposed action would not disproportionately affect any minority or low-income population or community.
- Implementation of the proposed action would not result in any identified effects that would be specific to any minority or low-income community.

2

ALTERNATIVES

This chapter describes three alternatives for Herring Cove Beach North site planning: two action alternatives and the no action alternative. Also discussed are several alternatives that were initially considered but then dismissed from further evaluation. The environmentally preferable alternative and the NPS preferred alternative are identified and two summary tables are presented, one that summarizes the highlights of each alternative and another that summarizes the impacts of the alternatives.

DEVELOPMENT OF ALTERNATIVES

Development of the alternatives presented in this document is the result of scoping within the NPS, coordination with representatives of the national seashore's Advisory Commission, the Town of Provincetown, and outreach to the general public during the planning process. To explore the range of options for meeting the purposes above, the Advisory Commission established the Herring Cove Beach Subcommittee (the Subcommittee). The Subcommittee was convened to assist with alternative development and make a recommendation on the preferred alternative. For more information on the Subcommittee, see chapter 5.

As part of the planning process, members of the technical team and the Subcommittee presented overviews of coastal science, engineering, and policy considerations that the Subcommittee would need to consider while developing and discussing options for the future of Herring Cove Beach. This included a brief geological history of Herring Cove, an overview of natural coastal processes of sediment transport, erosion and accretion, and the impacts of various man-made structures, which can disrupt these natural coastal functions. To understand the historic and estimated erosion rate of 2.5 feet per year at Herring Cove Beach, the Subcommittee examined a series of maps illustrating historic, current, and predicted shoreline locations. They also reviewed relevant federal and commonwealth policies and guidance on shoreline management.

The Subcommittee met four times between December 2012 and May 2013 to review potential alternative options. In addition to assisting with alternatives development, the Subcommittee also recommended a preferred alternative to and by the Advisory Commission. The preferred alternative recommended to the Advisory Commission was ultimately chosen as the NPS preferred alternative, as described later in this chapter.

ALTERNATIVE A: NO-ACTION

Under the no-action alternative, the NPS would retain the existing north parking lot in its current configuration and footprint (approximately 2.1 acres), which was an ad-hoc creation from an old roadway and would also retain much of the mile-long asphalt revetment (approximately 2.3 acres). These two structures (the parking lot and revetment) are contiguous and together comprise approximately 5,250 cubic yards of asphalt (otherwise known as bituminous paving). These structures would continue to be repaired with asphalt patches and other measures. Emergency work to remove and replace asphalt that has broken loose from the existing structures would be expected after storm damage. Facility closures would be expected for repairs, and sections of the parking lot may need to be closed when they are no longer safe to support vehicle passage. When sections are no longer structurally safe, they would be abandoned, and natural processes would be allowed to resume in these areas.

The public would continue to access the beach from the parking lot from as many of the 208 west-facing parking spaces that continue to be viable. The parking lot currently offers four spaces for disabled permit holders and five spaces for long vehicles such as recreational vehicles. The NPS would make an effort to retain accommodations for both types of spaces during any future section closures. In sections that must be closed due to safety issues, asphalt would be removed and disposed of offsite.

The parking lot would remain immediately adjacent to the beach, which provides easy access to a wide range of visitors and provides an unimpeded view of Cape Cod Bay. The NPS would continue maintenance activities to keep blowing sand off the asphalt, but no sand moving activities would take place west (shoreward) of the parking lot.

Amenities would continue to include a vault toilet at the north end of the parking lot and a bicycle route through the parking lot to connect Moors Road and the Herring Cove South parking lot to the Province Lands Bicycle Trail. Visitors would also have access to the newly renovated Herring Cove Beach bathhouse in the Herring Cove Beach South parking lot. The overall layout of this alternative is shown in figure 3A. Cross sections showing the profile of the project area in a few sample locations are shown in figure 3B.

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Herring Cove Beach North Public Access Site Plan
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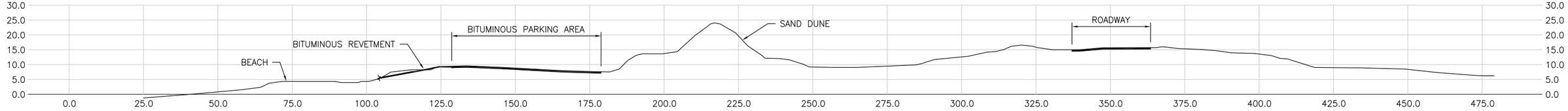
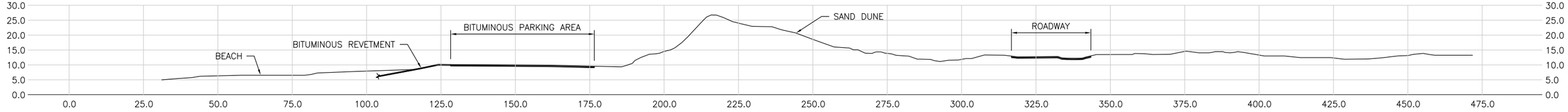
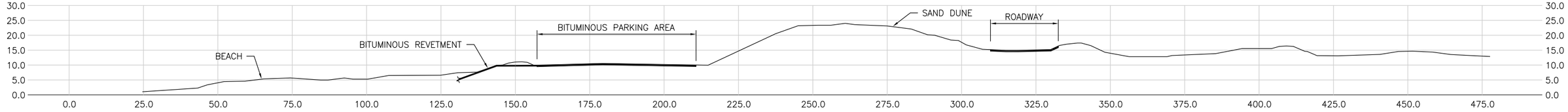
FIGURE 3A
Alternative A: No-action



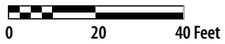
EXISTING SECTION A-A



EXISTING SECTION B-B



EXISTING SECTION C-C



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Herring Cove Beach North Public Access Site Plan
Environmental Assessment

FIGURE 3B

Alternative A: No-action
(Cross Section)

ALTERNATIVE B: PERIODIC RETREAT

Under alternative B, the NPS would remove the existing asphalt associated with the Herring Cove North parking lot and the mile-long revetment. The NPS would replace the asphalt parking lot with moveable sections of pavement that could be repositioned inland as the beach erodes. The sections would require a 25-foot shift landward every 10 years or as needed based on erosion of Herring Cove Beach. Concrete or natural materials such as crushed and compacted shells would be placed inland as the waterfront sections are removed to maintain a consistently sized parking area. The NPS would maintain approximately 200 west-facing spaces (designated by concrete wheel stops) in a parking lot footprint of approximately 2.4 acres. The parking lot construction work would be staged to occur in the winter months, with lot closures likely needed for several weeks when heavy equipment was staged to install new sections of the parking lot. Staging would be considered so that closures would be as minimal as possible, while allowing safe and efficient work limits. The overall layout of the version using concrete is shown in figure 4A. Cross sections for this option are shown in figure 4B. The overall layout of the version using crushed shell is shown in figure 5A. Cross sections for this option are shown in figure 5B.

The replacement parking lot would be constructed at a 15-foot elevation. This elevation was chosen because the highest base flood elevation of the project area is 14 feet as per Federal Emergency Management Agency Flood Insurance Rate Maps. To ensure the new parking lot would be kept out of the 100-year floodplain and plan for sea level rise over the next 50 years, an additional 1 foot was added to the 14-foot floodplain elevation for an elevation of 15 feet above mean sea level. The additional 1-foot elevation is based on providing an extra level of caution, similar to the freeboard for building construction purposes. To reach the desired elevation, the sand that has accumulated east of the existing parking lot would be redistributed to support the new parking lot and to provide a low-crested protective berm just to the west of the new parking lot. The NPS may use some vegetative plantings to stabilize the berm. Biodegradable jute or low fencing would also be considered, if needed. Each periodic retreat would have sand cut and fill redistribution depending on how the sand naturally dispersed since the last repositioning of the parking lot. However, no imported fill would be used for grading, although the pavement (either shell material or concrete planks) and base course materials (approximately 3,850 cubic yards) would be required to construct the new parking lot. Construction of the new lot would occur before removal of the existing lot.

In addition to parking lot improvements, the NPS would provide additional amenities to support recreational use of Herring Cove Beach North. The parking lot would remain very close to the beach. Views of the bay would remain unimpeded. Visitors may need to walk over a low sandy berm for approximately 10 feet to reach the beach. Accessible boardwalks and/or “mobi-mats” would be installed at accessible parking spots and possibly regular intervals to facilitate universal access.

“Mobi-mats” are already in use at the Coast Guard Beach.

The vault toilet at the north end of the parking lot would be maintained and would be relocated to a higher elevation when flooding in this area became a risk. A modest shade and wind shelter (approximately 100 square feet) and informational boards would be installed nearby. The design of the shade and wind shelter would match the new bathhouse features.

Bicycle lanes would be added along Province Lands Road to accommodate bicyclists travelling between Moors Road and Herring Cove Beach South and the Province Lands Bicycle Trail. The bicycle lanes would be 5 feet wide and located on both sides of the existing Province Lands Road for the approximately 2,000 feet where it runs parallel to the Herring Cove North parking lot.

The preliminary conceptual level costs required for this alternative are estimated to be $4.5 million initially, with an additional $5.75 million needed over the next 25 years for the periodic shifts and maintenance.

ALTERNATIVE C: ONE-TIME RETREAT (NPS PREFERRED)

Under alternative C, the NPS would replace the existing Herring Cove North parking lot and asphalt revetment with a new asphalt parking lot 125 feet inland from the current parking lot. A setback of 125 feet is intended to keep this facility beyond the reach of natural beach erosion (averaging 2.5 feet per year) for a 50-year life span. This parking lot would also be constructed at an elevation of 15 feet above mean sea level for the same reasons described under alternative B. The NPS would maintain approximately 200 west-facing spaces (designated by concrete wheel stops and pavement striping) in a parking lot footprint of approximately 2.4 acres. As under alternative B, the parking lot construction work would be staged to occur in the winter months. The new parking area could be constructed prior to closure of the existing lot. Staging would ensure closures would be as minimal as possible, while allowing safe and efficient work limits. The overall layout of this alternative is shown in figure 6A. Cross sections showing the profile of the project area in a few sample locations are shown in figure 6B.

As under alternative B, the sand that has accumulated east of the existing parking lot would be redistributed to support the new parking lot and to provide a low-crested protective berm just to the west of the new parking lot. Unlike under alternative B, this redistribution of sand would take place once. Following initial construction, additional disturbance of this berm would be limited to visitors passing through to access the beach and possible maintenance to ensure that the water can be viewed from vehicles. No additional fill would be used for grading, although some asphalt and subgrade materials (approximately 3,850 cubic yards) would be required to construct the new parking lot.

The same recreational amenities proposed under alternative B would take place under alternative C, with a few slight differences. The distance between the parking lot and the beach would be longer, but as under alternative B, the NPS would provide mobi-mats and/or boardwalks. Similarly, the view of the bay from the parking lot would remain unimpeded; however, there would be approximately 125 feet of separation between the parking lot and the beach. The low-crested sandy berm between the parking lot and the beach would be shaped at a height that would not interfere with water views from the parking lot.

As under alternative B, bicycle lanes would be added to accommodate bicyclists travelling between Moors Road and Herring Cove Beach South and the Province Lands Bicycle Trail; however, under this alternative, the bicycle lanes would be incorporated in a 10-foot wide bike route along the eastern edge of the new parking lot. The area of disturbance required to install this bike route would be approximately the same as under alternative B but would be adjacent to the new parking lot instead of Province Lands Road.

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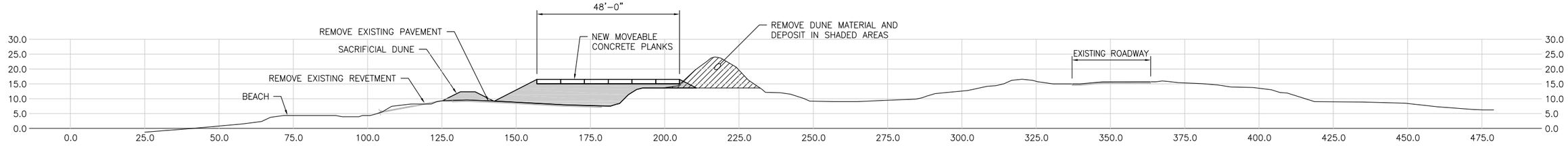
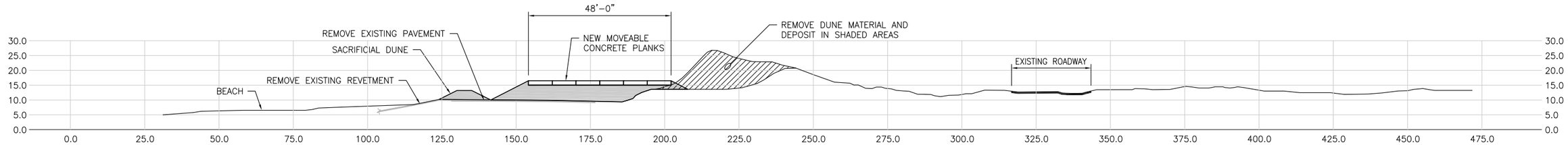
Herring Cove Beach North Public Access Site Plan
Environmental Assessment

FIGURE 4A

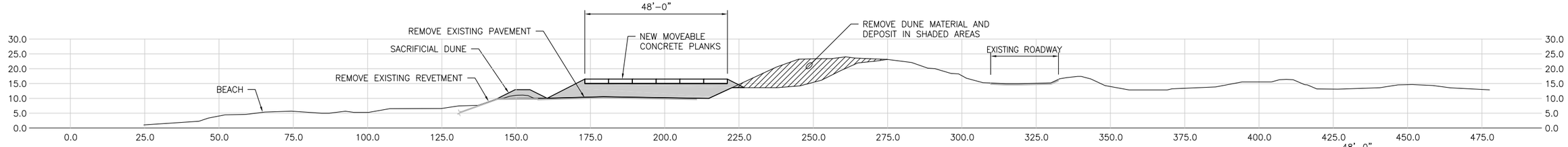
Alternative B: Periodic Retreat (Concrete Option)



PROPOSED SECTION A-A

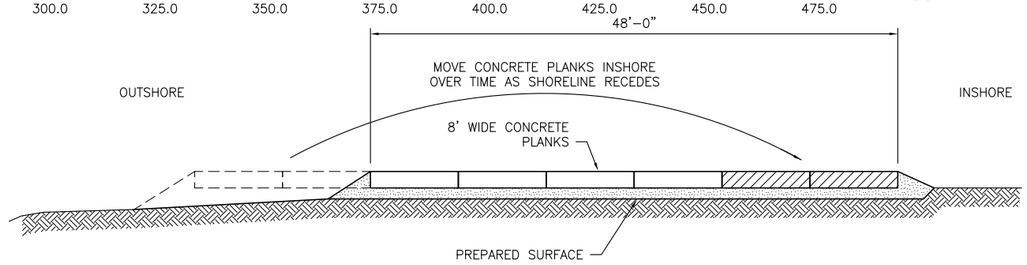


PROPOSED SECTION B-B



PROPOSED SECTION C-C

0 20 40 Feet



TYPICAL SECTION

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Herring Cove Beach North Public Access Site Plan
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FIGURE 4B

Alternative B: Periodic Retreat (Concrete Option) (Cross Section)

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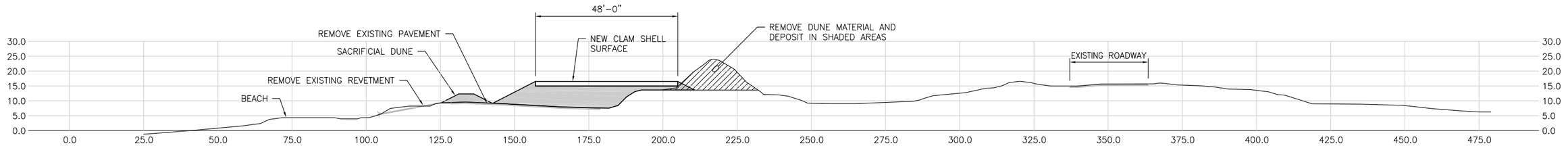
Cape Cod National Seashore

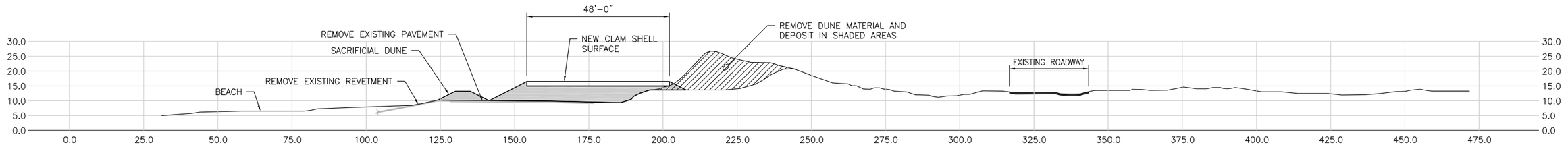
Herring Cove Beach North Public Access Site Plan
Environmental Assessment

FIGURE 5A

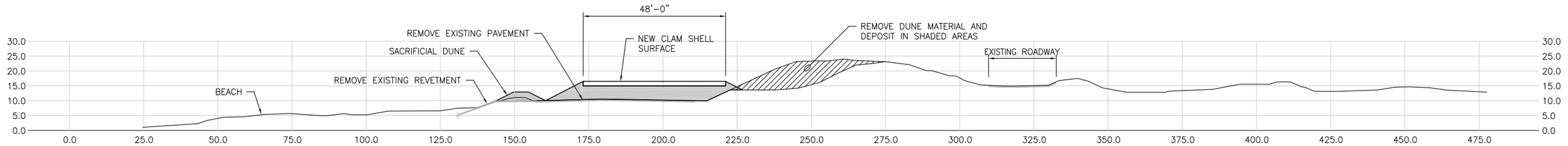
Alternative B: Periodic Retreat (Shell Option)



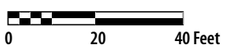
PROPOSED SECTION A-A

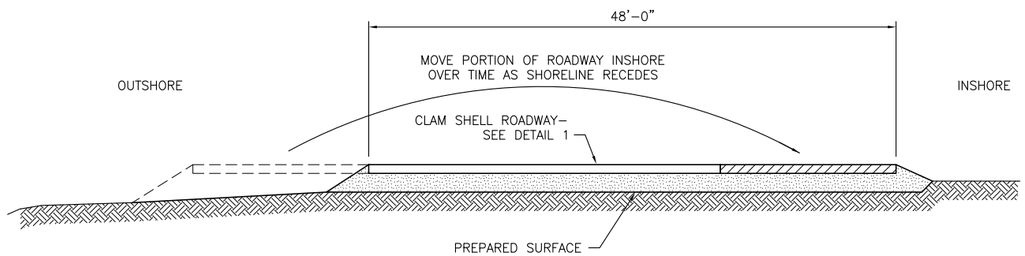


PROPOSED SECTION B-B

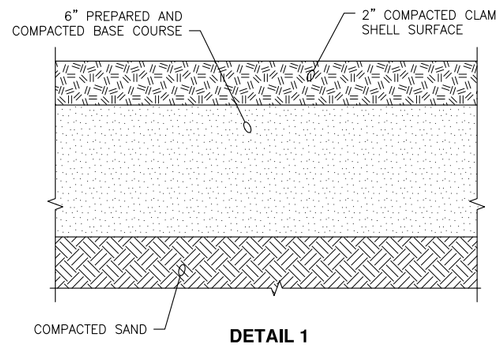


PROPOSED SECTION C-C





TYPICAL SECTION



DETAIL 1

Herring Cove Beach North Public Access Site Plan Environmental Assessment

National Park Service
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FIGURE 5B

Alternative B: Periodic Retreat (Shell Option) (Cross Section)

Herring Cove Beach North Public Access Site Plan
Environmental Assessment

National Park Service
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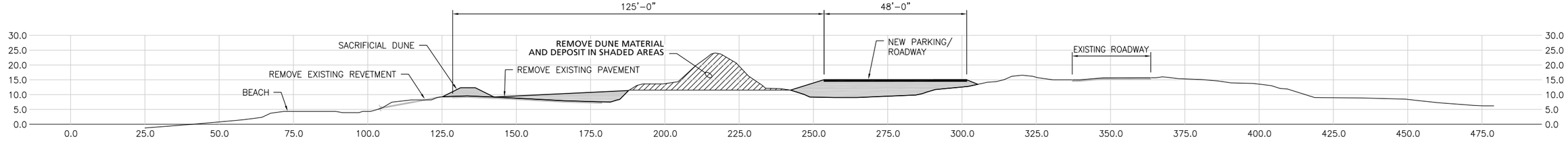
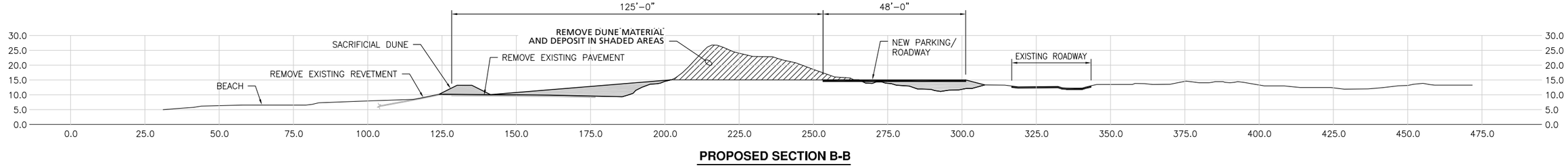
Cape Cod National Seashore

FIGURE 6A
Alternative C: One-time Retreat



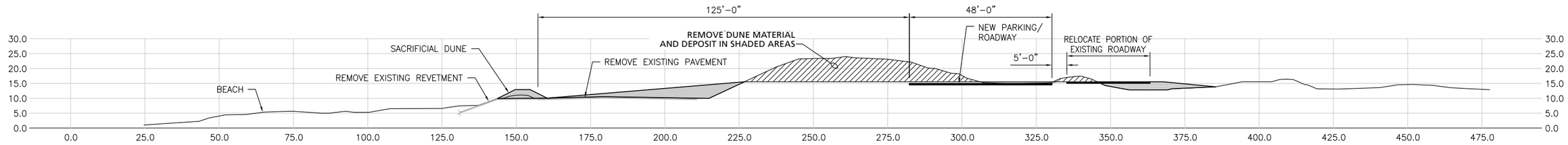
PROPOSED SECTION A-A

SCALE: 1"=20'–0"



PROPOSED SECTION B-B

SCALE: 1"=20'–0"



PROPOSED SECTION C-C

SCALE: 1"=20'–0"

FIGURE 6B

Alternative C: One-time Retreat (Cross Section)

Another difference in project area layout under alternative C is that the 125-foot setback of the parking lot would require that Province Lands Road be realigned for a distance of approximately 450 feet. Approximately 0.3 acres additional acres would be disturbed when this section of roadway is shifted east. Drivers along Province Lands Road would also have a clear sightline into the parking lot, and to Cape Cod Bay beyond. The national seashore would install "No Parking" (or similar) signs along to discourage visitors from parking or dropping off along Province Lands Road to avoid paying the recreational fee.

The preliminary conceptual level costs for this alternative are estimated to be approximately $4.5 million initially, with an additional $825 thousand needed for maintenance over the next 25 years.

MITIGATION MEASURES

To minimize environmental impacts related to the action alternatives, the NPS would implement mitigation measures whenever feasible. Most of the mitigation measures would be related to the temporary adverse impacts resulting from removal of materials and new construction. Although the exact mitigation measures to be implemented would depend upon the final design and approval of plans by relevant agencies, the following is a list of actions that could take place:

- Measures would be employed to prevent or control spills of fuels, lubricants, or other contaminants.
- All exposed soil or fill material would be permanently stabilized at the earliest practicable date.
- Stockpile materials would be placed in the parking lot to avoid impacting any natural features unnecessarily.
- The national seashore would include a post-construction assessment in their work plan for a year after any construction disturbance and would eradicate invasive species mechanically (by hand) at that time.
- No construction would occur between April 15 and August 30 to avoid the spadefoot toad breeding season and minimize activity during the box turtle active season.
- Visual sweeps of the construction limits would occur daily during construction through November, and any turtles found would be relocated from the construction limits. These activities would be conducted under the supervision of the national seashore's Wildlife Biologist.
- Construction equipment would be restricted to paved surfaces where practicable to avoid impacts on natural resources, including spadefoot toad and box turtle habitat.
- Care would be taken to avoid any rutting caused by vehicles or equipment.
- If during construction previously undiscovered archeological resources were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the Massachusetts SHPO.
- Temporary advanced warning signs would be installed to warn of closures during construction.

ALTERNATIVE ELEMENTS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

The options for potential replacement public beach facilities were narrowed through internal scoping and through meetings with the Subcommittee representatives and the public. During this process, the objectives of the project and the planning issues were considered. Several alternatives were dismissed from further analysis.

ELEVATION IN PLACE

This alternative would allow the parking lot to remain in its current location, but the NPS would elevate it above the 100-year flood line by 2 feet. This concept of building a new parking lot on piles was discussed as a way to rebuild in place with less interference with natural sand movement along the shoreline. The parking lot would rest upon durable piles driven deep into the sand. Stairs or other means would be incorporated to enable people to access the beach from the elevated parking lot. The cost to build this alternative would be more than twice the cost of building the alternatives described above. Cost was an important factor for dismissing this alternative. Maintenance of the parking lot in this location would ultimately require more intensive maintenance of the access road, as well. This alternative would not be consistent with the project's objective of responding to coastal processes and shoreline change in a way that is consistent with commonwealth and federal policies, and although a water view would be maintained, beach access would be lost. Therefore, this alternative was considered but dismissed from further analysis.

PERIODIC RETREAT (ALTERNATE CONFIGURATION)

This concept calls for reconfiguring the parking lot, while retaining a similar number of parking spaces as the current parking lot. The concept preserves the view of the beach for some spaces, but moves other parking spaces away from the beach, creating multiple rows of parking spaces instead of one long row of parking spaces. This would reduce the overall percentage of parking spaces with direct view of the ocean but maintain the number of parking spots. It also would create "pods" of parking spaces that could be moved as erosion occurs in each area. This would enable the NPS to only move the pods affected by erosion and avoid the cost of moving the entire parking area back at once. This alternative would not meet the project objective to maintain the visitor experiences and community values of accessibility and waterfront parking. In addition, it would require disturbance of a relatively large area of very sensitive and currently undisturbed heathland east (inland) of Province Lands Road. Therefore, this alternative was considered but dismissed from further analysis.

INSTALL GROINS AND NEW SEAWALL

Over the past year the construction of a new seawall and groins was discussed, in conjunction with beach nourishment with the objective of retaining the existing parking lot in place. State policies discourage these interventions, essentially attempting to protect the beneficial functions existing at the shoreline. Additionally, a central goal of NPS policy is to allow natural processes, including erosion and sedimentation, to proceed unimpeded. As such, the NPS permits the development of structures where

damage to natural processes is expected with caution after careful consideration. Therefore, this alternative was considered but dismissed from further analysis.

REMOTE PARKING

A remote parking lot is also a retreat strategy that has been used by the NPS at Cape Cod National Seashore, which town officials, residents and visitors were concerned about as an inappropriate approach for Herring Cove Beach. The retreat strategy was implemented after the loss of the parking lot in the Blizzard of 1978 at Coast Guard Beach in Eastham, which has a different set of parking challenges due to the constrained site bounded by ocean, barrier beach and salt marsh. A remote parking lot at Herring Cove Beach would likely be east of the existing roadways, presenting a great deal of challenge for visitor safety and experience. Because other siting options were available nearby, the remote parking option was dismissed from further consideration.

SUMMARY OF THE ALTERNATIVES

Table 1 provides a summary of the alternatives presented above.

TABLE 1. SUMMARY OF ALTERNATIVES

Alternative Element	Alternative A: No-action	Alternative B: Periodic Retreat	Alternative C: One-time Retreat (NPS Preferred)
Parking Lot	Retain existing 4.34 acre asphalt parking lot and revetment in current location and at current elevation. Parking lot would offer at most 208 west-facing spaces. Spaces offered may decrease over time.	Replace existing parking lot with a 2.4 acre parking lot made of materials that can migrate inland as beach erosion continues. Parking lot would be constructed at an elevation of 15 feet above sea level. Parking lot would offer approximately 200 west-facing spaces.	Replace existing parking lot with a new 2.4 acre asphalt parking lot located 125 feet inland and constructed at an elevation of 15 feet above mean sea level. Parking lot would offer approximately 200 west-facing spaces.
Access to Beach	The parking lot would remain immediately adjacent to the beach. As more of the asphalt revetment is exposed by natural coastal processes, visitors would need to walk down the revetment to access the sandy beach.	The parking lot would remain very close (0 to 25 feet) to the beach and would be raised approximately 5 feet above the current elevation. Boardwalks and/or mobi-mats would be provided.	Visitors would walk approximately 125 feet or less to the beach from a parking lot raised approximately 5 feet above the current elevation. Boardwalks and/or mobi-mats would be provided.
Water View	Water is viewed from parking immediately adjacent to the beach. The number of spaces available for this use may be reduced over time.	Water view remains unimpeded (up to 25 feet from the beach), and 200 spaces would be available for this use.	Water view remains unimpeded from approximately 125 feet inland, and 200 spaces would be available for this use.
Bicycle Accommodations	To connect Moors Road and the Herring Cove South parking lot to the Province Lands Bicycle Trail, bicyclists travel through the Herring Cove North parking lot.	To connect Moors Road and the Herring Cove South parking lot to the Province Lands Bicycle Trail, bicyclists travel along Province Lands Road using the bicycle lanes (5-feet wide) on both sides of the road.	To connect Moors Road and the Herring Cove South parking lot to the Province Lands Bicycle Trail, bicyclists travel through a dedicated 10-foot wide bicycle lane along the eastern edge of the new Herring Cove North parking lot.
Province Lands Road	Remains as is.	No change in alignment. Bicycle lanes added (see above).	Approximately 450 feet would be realigned to accommodate the shift in parking lot.

TABLE 1. SUMMARY OF ALTERNATIVES (CONT.)

Alternative Element	Alternative A: No-action	Alternative B: Periodic Retreat	Alternative C: One-time Retreat (NPS Preferred)
Meets purpose of and need for project?	No. Although some parking would be retained at the currently location, the amount available for parking next to the beach and for water views would be reduced as coastal erosion caused the loss of integrity in some areas. Attempting to maintain this parking lot is not considered a sustainable option.	Yes. Parking would be retained at the current capacity and in the current location to provide immediate access to the beach and water views; however, the parking lot would be constructed in such a way that it could retreat from the shoreline periodically so that integrity of the parking lot could be sustained over time.	Yes. Parking would be retained at the current capacity but would be set back slightly (125 feet) from the shoreline to allow coastal processes between the bay and the parking lot to function more naturally. This alternative would continue to provide access to the beach and water views but from a location at most 125 feet from the beach.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2 provides a summary of the environmental consequences related to each alternative. A more detailed explanation of the impacts is presented in "Chapter 4: Environmental Consequences."

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

	Alternative A: No-action	Alternative B: Periodic Retreat	Alternative C: One-time Retreat (NPS Preferred)
Coastal Processes	The asphalt parking lot and revetment would alter the natural flow of sediment both cross-shore and along approximately 1 mile of shoreline within the project area. The foredune would continue to be separated from the rest of the shoreline by the parking lot and revetment. This impact would not likely be significant.	Removal of the asphalt parking lot and revetment would allow restoration of more natural sediment flows along approximately 1 mile of shoreline. The foredune would be relocated to be adjacent to the rest of the shoreline. Periodic retreat of the parking lot may cause some construction-related disturbance of the system. The impact would not likely be significant.	Same as alternative B except the new parking lot would be reconstructed 125 feet east (inland) from the existing parking lot instead of retreating periodically. The foredune would be relocated to be adjacent to the rest of the shoreline and would not be subject to construction-related disturbance following initial construction of the new parking lot. The impact would not likely be significant.
Vegetation	Disturbance of vegetation would remain limited to the edges of the parking lot where sand is removed each year to keep the parking lot clear. Vegetation would continue to be displaced where current infrastructure is installed (totaling approximately 5.1 acres). This impact would not likely be significant.	Initial construction/demolition: • 2.8 acres of pioneer/scrub dune vegetation disturbed/ destroyed. • 3.4 acres of vegetation displaced by new parking lot. • 2.3 acres free for revegetation where revetment is removed. • 0.5 acres displaced/ disturbed for bicycle lane installation Periodic shift (approx. every 10 years) of parking lot: • 1.2 acres of vegetation east of the parking lot removed • 1.2 acres of vegetation west of parking lot reestablished This impact would not likely be significant.	Initial construction/demolition: • 5.4 acres of pioneer/scrub dune vegetation disturbed/destroyed. • 3.4 acres of vegetation displaced by new parking lot. • 3.4 acres free for revegetation where parking lot and revetment are removed. • 0.5 acres displaced/ disturbed for bicycle lane installation • 0.3 acres of heathlands disturbed along Province Lands Road. No periodic shifts (one-time construction/demolition period). This impact would not likely be significant.

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONT.)

	Alternative A: No-action	Alternative B: Periodic Retreat	Alternative C: One-time Retreat (NPS Preferred)
Floodplains	The parking lot and mile-long revetment (approximately 21,000 square yards of asphalt) remain within the 100-year floodplain (zone V). Flow of water through the floodplain would be altered by these structures. This impact would not likely be significant.	The existing parking lot and revetment would be removed. The parking lot would be replaced in approximately the same location with a parking lot that would be raised to 15 feet to remove it from the 100-year floodplain. This structure would retreat from the shoreline periodically but may, at some points, impede water flow within the project area. This impact would not likely be significant.	The existing parking lot and revetment would be removed. The parking lot would be replaced in kind approximately 125 feet east (inland) of its current location and raised to an elevation of 15 feet. This would remove the parking lot from the 100-year floodplain. The natural values of the floodplain would be restored. This impact would not likely be significant.
Public Use and Experience	Parking spaces: up to 208 vehicles, (with fluctuation and ultimate reduction due to storm damage and repairs). Parking location: adjacent to the beach, providing access for almost all users, regardless of mobility limitations. Views of the beach and Cape Cod Bay: remain unimpeded. Bicycle safety: share parking lot, causing safety concerns Other amenities: • vault toilet at the north end of the parking lot would be maintained. These impacts would not likely be significant.	Parking spaces: approximately 200 vehicles. Temporary decrease during construction. Parking location: up to 10 feet from the beach. A boardwalk and/or mobi-mats would be used to improve accessibility. Views of the beach and Cape Cod Bay: remain unimpeded (same as alternative A). Bicycle safety: improved through addition of dedicated bicycle lanes on Province Lands Road. Other amenities: • vault toilet at the north end of the parking lot would be maintained • new shade shelter would further improve visitor comfort • additional information sign would improve visitor orientation These impacts would not likely be significant.	Parking spaces: same as alternative B, except no decrease in parking capacity during construction. Parking location: up to 125 feet from the beach. A boardwalk and/or mobi-mats would be used to improve accessibility, as under alternative B. Views of the beach and Cape Cod Bay: remain unimpeded, (same as alternatives A and B). Bicycle safety: improved through addition of dedicated bicycle route along eastern edge of new parking lot. Other amenities: • same as alternative B These impacts would not likely be significant.

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONT.)

	Alternative A: No-action	Alternative B: Periodic Retreat	Alternative C: One-time Retreat (NPS Preferred)
Socioeconomic Resources and Adjacent Lands	The local population and economy would continue to benefit from Herring Cove Beach's continued popularity, despite the lack of improvements. The need for emergency repairs to the asphalt revetment and parking lot would provide work for contractors. These impacts would not likely be significant.	A new parking lot would be provided that would be able to retreat from coastal erosion and thereby remain intact and remaining a popular tourist attraction. Bicycle lanes along Province Lands Road would improve bicycle accommodations, which could cause a rise in bicycle rentals in Provincetown. Periodically shifting the paving materials and adding the bicycle lanes along Province Lands Road would provide work for contractors. These impacts would not likely be significant.	Same as alternative B, except construction jobs would be generated only during initial construction. These impacts would not likely be significant.
Operations and Infrastructure	Storm damage assessment and repair: needed regularly. Clearing of accumulated sand: required annually with additional clearing possibly needed following storm events. Bicycle accommodation: shared path through existing parking lot Other infrastructure to be maintained: • vault toilet Maintenance cost: No cost estimate is available. These impacts would not likely be significant.	Storm damage assessment and repair: occasionally needed. Clearing of accumulated sand: less frequent. Bicycle accommodation: 5-foot bicycle lane would be added on both sides of Province Lands Road. Other infrastructure to be maintained: • shade shelter added • informational sign added • vault toilet If necessary, these facilities would be relocated periodically. These impacts would not likely be significant.	Storm damage assessment and repair: rarely needed. Clearing of accumulated sand: same as alternative B. Bicycle accommodation: a 10-foot bicycle path would be added along the eastern side of the new parking lot. Other infrastructure to be maintained: • shade shelter added • informational sign added • vault toilet (relocated once, if necessary) These impacts would not likely be significant.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

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

Based on the analysis of environmental consequences of each alternative presented in chapter 4 and summarized in table 2 above, alternative C is the environmentally preferred alternative. Alternative C provides a new recreational beach experience that features a long-term retreat of manmade materials from the coast with a one-time disturbance to the dune environment versus repeated retreat and construction disturbances. Coastal processes would be most restored under this alternative with the establishment of a vegetated, low-crested dune immediately adjacent to the shore, allowing more space for sediment transport processes to reach a more natural dynamic equilibrium.

NPS PREFERRED ALTERNATIVE

Alternative C was identified as the NPS preferred alternative because it best meets the project's goals, objectives, and purpose of and need for action. Alternative C best balances protection of natural processes with the public beach recreation accommodations. Although alternative C would result in temporary adverse impacts on coastal processes, national seashore managers believe that the removal of the asphalt revetment and parking and the relocation of the primary dune to an area west of the parking lot where it would thereafter be mostly undisturbed would ultimately allow more natural coastal processes to resume. Retreat of the parking lot from the shore by 125 feet and relocation of the dune would also provide protection of the park's investment in this new infrastructure and provide for improved visitor safety over all other alternatives. The one-time retreat would also maintain visitor access of the valued waterfront while providing a parking area which is protected from severe weather damage. Therefore, alternative C has been identified as the NPS preferred alternative.

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3

AFFECTED ENVIRONMENT

The "Affected Environment" chapter describes the project area environment; relevant physical and biological processes within the project area; and the existing conditions for those elements of the natural, cultural, and human environment that could be affected by the implementation of the actions considered in this EA. The impact topics addressed in this EA include coastal processes, vegetation, floodplains, public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure. Impacts for these impact topics are analyzed in "Chapter 4: Environmental Consequences."

NATURAL AND PHYSICAL RESOURCES

The following sections summarize the existing conditions of these natural and physical resources within the project area that have the potential to be impacted by the proposed actions considered in this document. This includes a discussion of the processes at work historically and presently to shape this dynamic landscape and also includes the potential changes in the current conditions given expected changes in sea level.

Climate change and sea-level rise are issues affecting many aspects of the natural and physical resources of the project area. Because these trends are being driven by the emission of greenhouse gasses, scientists have predicted a wide range of changes over the next century, all of which incorporate a number of different variables, including varying rates of greenhouse gas emissions. The *Climate Change Adaptation Report* by the Executive Office of Energy and Environmental Affairs of the Commonwealth of Massachusetts predicts that the average annual temperature for Massachusetts will increase 5 to 10 degrees Fahrenheit by 2100 (EEA 2011). The Massachusetts Climate Change Report (EEA 2011) presents a global sea-level rise projection by 2100 of 11 inches, and an estimate of local subsidence rate for Massachusetts of 4 inches per century. Given these values, sea level in Massachusetts is anticipated to rise 15 inches by 2100. The implications of these items under each particular impact topic are addressed in their respective sections below.

COASTAL PROCESSES

Cape Cod's beaches are dynamic systems, constantly altered by wind and waves. The project area is located on the western edge of the Province Lands spit, an expansive 400-acre dune landscape that is accreting due to the longshore transport of sand from the glacial scarps to the south (NPS n.d.). The Natural Resources Conservation Service soil survey of Barnstable County, Massachusetts identifies Hooksan sand and beach map units as the dominant soil types dominate the Province Lands, including the project area (NRCS 2013, NPS 1998). These soils are classified as excessively drained (NRCS 2013) and are subject to severe wind erosion (NPS 1998), especially in sparsely vegetated areas. The prevailing winds in this area are from the west, southwest, and northwest (NPS n.d.).

Longshore sediment transport, one of Cape Cod's most important nearshore processes, affects beach morphology and directly influences the shoreline's tendency to accrete, erode, or remain stable (Berman 2011). The net transport of sediment is from the Atlantic Ocean beaches north, then west, then southward into Cape Cod Bay and around the Provincetown Hook (Berman 2011). On Cape Cod, as on most coastlines, the wind and wave directions are variable day-to-day and have seasonal trends (i.e., winter storms and summer calm). While longshore currents act like a shallow river flowing parallel to the shoreline, the flow of sediment is not always steady and can be highly punctuated by storm events (Berman 2011).

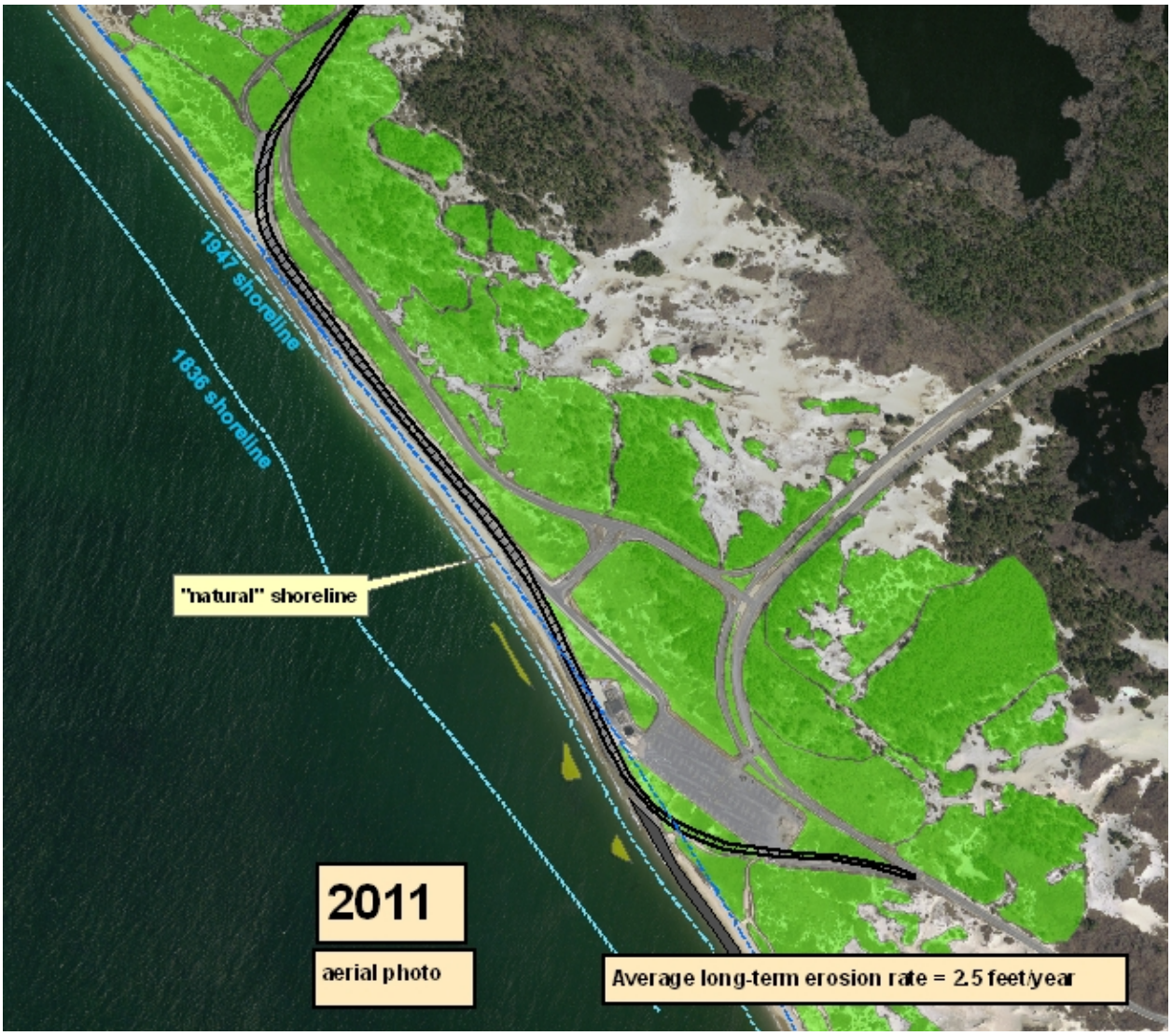
Within the project area, the waters of Cape Cod Bay interface with the Province Lands at the beach, otherwise known as the foreshore or intertidal zone. The beach is influenced by waves and currents and is the primary zone of sediment transport. The higher portions of the beach, the backshore and dune, are the primary zones of sediment storage and are discussed below. Sediments are transported by longshore currents, wave action and rip currents (NPS 1998). Longshore currents in this area typically move southward, with a net movement of sediment to the Province Lands Hook (Berman 2011). The shoreline is also shaped by storm events such as hurricanes and nor'easters (NPS 1998).

A team of technical experts supporting this planning process examined the historical elevation data from the 1830s and 1860s as well as the Marindin surveys from late 19th century. The team converted the historical elevation data to the present datum and illustrated this in the figure below. Based on this data, the team estimates that shoreline erosion is taking place at a rate of approximately 2.5 feet per year. This rate of erosion is an average; some years the beach may not erode at all, and other years it may erode 25 feet at once in response to significant coastal storms. Land subsidence and sea-level rise are likely to ensure that this erosion continues in the future.

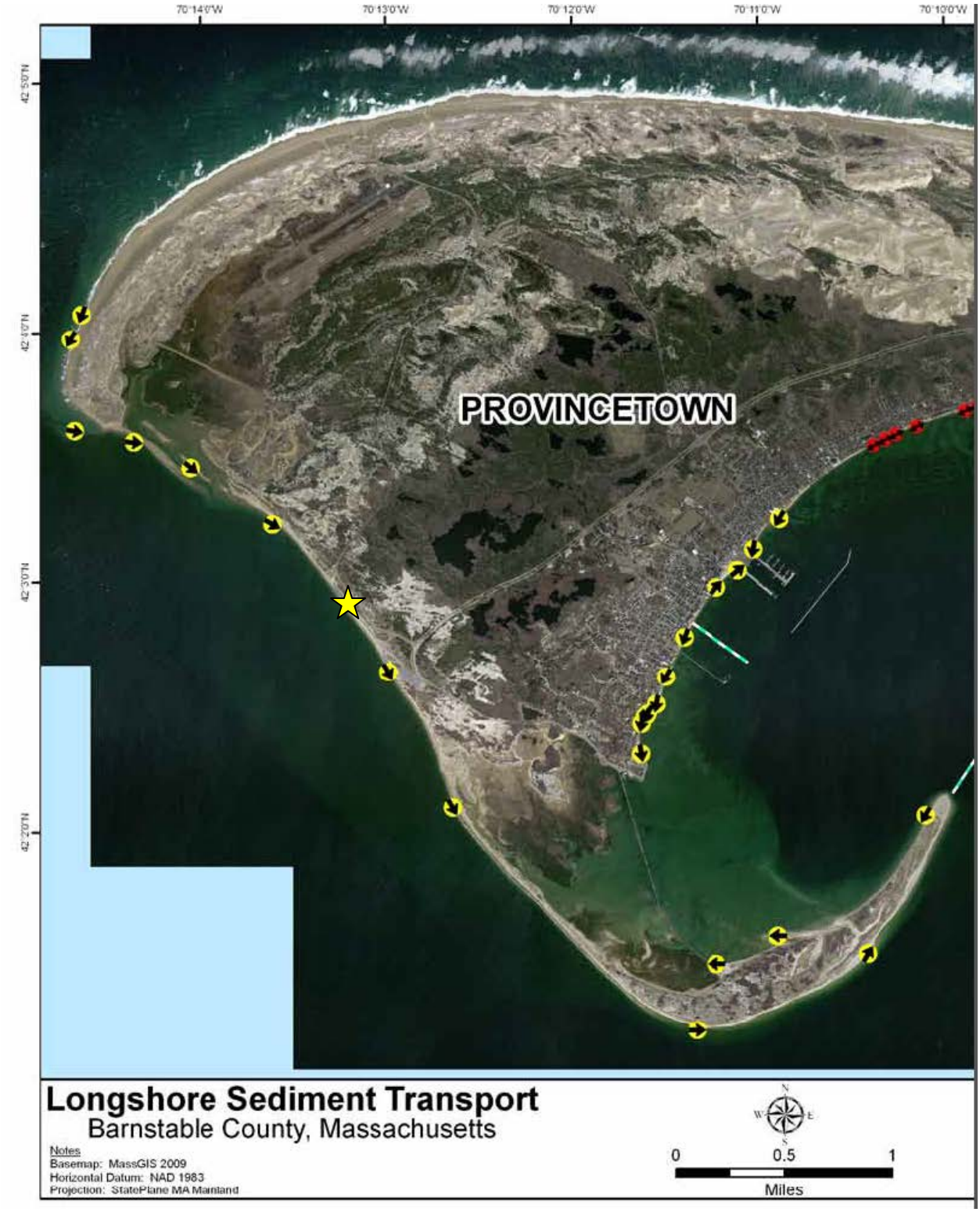
Dunes are terrestrial landforms that develop from buildup of wind-deposited sands. The project area includes linear foredunes, heavily shaped by the man-made structures surrounding them. As mentioned earlier, the higher portions of the beach, the backshore and dune, are the primary zones of sediment storage in a coastal system. In a natural system, the vegetated dune just behind and adjoining the backshore receives and accumulates landward-moving wind-transported sand. Sand transport between the foreshore and the backshore and dunes is referred to as cross-shore transport. If the dune is not present, the landward-moving sand keeps blowing inland and is lost to the coastal system. A loss of this sand to the coastal system contributes to coastal erosion. When the coastal dune is in place, the stored sediment is not lost to the system; when storm waves erode it, the sand is returned to the zone of transport. As mentioned earlier, beaches typically undergo seasonal fluctuations where sand builds up onshore during

the summer months, but in the stormier winter months, sand is often pulled from the dunes onto the beach and possibly offshore areas and sandbars.

The image below also indicates the "natural shoreline." This line is the technical team's best estimate of where the shoreline would be in 2012 if there were no built structures (parking lot, revetment, etc.). The natural shoreline would be a result of how waves move the available sand supply to form the curving shoreline from Race Point to Wood End. The dominant waves (average wave height and direction) result in a net movement of sand toward the southeast. The potential reshaping of the shoreline that would take place if these manmade structures were removed is discussed in chapter 4.



A recent (2011) aerial shows the current shoreline (and the approximate "natural" shoreline) in comparison to the 1836 and 1947 shorelines. The road indicated on the map follows the footprint of the parking lot built in the 1930s. The green shading indicates vegetated dunes. Shaded areas in the water indicate remnants of rock groins.



The yellow arrows in this graphic indicate the net longshore sediment transport patterns. The yellow star was added to the original graphic to indicate the general location of the project area discussed in this EA. Source of original graphic: Berman 2011.

Within the project area, westerly winds remove sand from the Herring Cove Beach and move it landward. Under the existing conditions, the 1-mile long asphalt revetment is meant to stabilize the sand supporting the Herring Cove North parking lot and other facilities. While it is intact, it prevents undermining and erosion of this sand and in doing so isolates potential sand sources from the nearshore sediment budget. When the revetment was constructed, a wider beach existed west of the revetment, and that beach fed the nearshore sediment budget; however, the beach has narrowed over time, resulting in the revetment being more frequently involved in coastal processes.

The revetment and parking lot also separate the dunes to the east of the parking lot from the beach by up to 85 feet, impeding the exchange of sand between the otherwise connected beach and dune systems. Although some windblown sand is stored in these dunes, the sand that accumulates in the parking lot is removed by maintenance crews following each winter season. This sand is dispersed into the beach and the primary dune.

VEGETATION

Dune ecosystems are characterized by a prevalence of vegetation adapted for life in dry soil conditions. The sandy soils of this area are highly permeable and therefore have very low water holding capacity. In addition to dry conditions, plants in coastal dune habitats must be adaptable to low soil fertility, salt spray, and physical abrasion from wind-borne particulates. Under such conditions, the vegetative community is typically reduced to drought-tolerant herbaceous species or dry scrub/thicket assemblages.

Dune Pioneer and Shrub/Thicket

Within the project area, areas of shifting sands (such as those areas between Herring Cove North parking lot and Province Lands Road and those areas at lower elevations along adjacent dune slopes) are characterized as pioneer zones. Such areas are extremely stressful to plant life due to the unstable substrate and low water availability. Therefore, pioneer zones are vegetated with stress-tolerant pioneer species capable of rapid recruitment and high growth rate such as American beachgrass (*Ammophila breviligulata*), switchgrass (*Panicum virgatum*), and wavy hairgrass (*Deschampsia flexuosa*). In addition, a host of non-native weedy species is able to persist in this zone, particularly along the road edge where sand compaction from foot and vehicular traffic is common. Such species include dusty miller (*Artemesia stellaria*), knapweed (*Centaurea* spp.), clover (*Trifolium* spp.), and Queen Anne's lace (*Daucus carota*).

At higher elevations, conditions become more stable due to reduced wind stress, stabilizing sediments, and a consequent increase in soil moisture. The resultant community is characterized as dune shrub/thicket, with shrubs and low, stunted trees often forming dense colonies. Species include beach plum (*Prunus maritima*), bayberry (*Morella pensylvanica*), eastern red cedar (*Juniperus virginiana*), and a nonnative species, rugosa rose (*Rosa rugosa*). Common understory associates in this zone include beach pea (*Lathyrus japonicus*), seaside goldenrod (*Solidago sempervirens*), bearberry (*Arctostaphylos uva-ursi*), Virginia creeper (*Parthenocissus quinquefolia*), black huckleberry (*Gaylussacia baccata*), and poison ivy (*Toxicodendron radicans*).

The view of the existing parking lot, looking south. The existing dune vegetation is shown on the left. Photo credit: NPS.

Sandplain Heathlands

Beyond the primary dunes and located east of Province Lands Road, the landscape is dominated by a heathland community. This community occurs on stabilized dunes and on outwash deposits near the coast where winds have blown beach sand over glacially deposited sands and gravels.

Heathlands east of Province Lands Road.

Dwarf-shrubs generally described as ericaceous are dominant in the sandplain heathland association. Most common are *Arctostaphylos uva-ursi* (kinnikinnick), *Hudsonia ericoides* (pinebarren goldenheather), *Gaylussacia baccata* (black huckleberry), *Vaccinium angustifolium* (lowbush blueberry) and *Vaccinium pallidum* (Blue Ridge blueberry), *Corema conradii* (broom crowberry), *Epigaea repens* (trailing arbutus), and *Gaultheria procumbens* (eastern teaberry). Frequent associates include *Morella pensylvanica* (northern bayberry), *Lechea maritima* (beach pinweed), *Baptisia tinctoria* (horseflyweed), *Ionactis linariifolius* (flaxleaf whitetop aster), and the grasses *Schizachyrium scoparium* (little bluestem), *Danthonia spicata* (poverty oatgrass), and *Deschampsia flexuosa* (wavy hairgrass). *Cladonia* (cup lichen) and *Cladina* (reindeer lichen) lichens may be abundant. The community only rarely supports invasive species (NPS 2010c).

FLOODPLAINS

Due to its low elevation and proximity to the coast, much of the project area is within the 100-year floodplain. According to existing Flood Insurance Rate Maps from 1992 (map number 255218 0003C), the project area in the vicinity of the existing revetment and the Herring Cove North parking lot are located within the area of 100-year coastal flood with velocity (wave action). Base flood elevations vary

between 13 and 15 feet. The current parking lot is at an elevation of approximately 10 feet. According to this map, the area beyond the revetment is designated as an area of minimal flooding.

For the purposes of this planning process, the national seashore is using a preliminary map update (map number 25001C0 111J) issued in May 2013. Under this delineation, the project area closest to the shore (including the revetment and portions of the Herring Cove North parking lot) remains classified as a special flood hazard area subject to inundation by the 1% annual chance flood event with additional hazards due to storm-induced velocity (wind and wave action). Observations by national seashore staff confirm that Herring Cove North parking lot is often inundated during major storm events. Prior to impending flood events, the national seashore closes flood-prone areas to the public to avoid safety concerns.

The Herring Cove North parking lot was flooded (and its asphalt damaged) during a storm in January 2010.

A line following the sand that has accumulated between the parking lot and Province Lands Road delineates the primary frontal dune boundary. Behind this line and east of Province Lands Road, the elevation drops slightly, and some of the inland areas below 12 feet are also within the 100-year flood plain. These areas remain within the coastal barrier resources system but are not within special flood hazard areas or floodway areas. The entire area is within the 500-year floodplain (i.e., the area subject to a 0.2% annual chance of flooding). The base flood elevation indicated for this zone is 14 feet.

When the parking lot and its accompanying facilities within the project area were constructed, they may have been outside the 100-year flood zone; however, the rate of coastal erosion has brought the shoreline and the flood zone eastward through the years until the existing elevation of the parking lot is no longer sufficient to avoid flooding. Under the sea level rise scenarios predicted over the next 50 to 100 years, the rate of coastal erosion may increase, and the frequency of 100-year storm events would also be expected to increase (EEA 2011).

PUBLIC USE AND EXPERIENCE

Cape Cod National Seashore draws over four million visits annually (NPS 2013). Herring Cove Beach is a very popular beach located on the northwestern part of the national seashore. It is usually the second beach parking lot to fill during the summer months in the national seashore (after the Nauset Light Beach parking area in Eastham) (Thatcher 2013). Approximately 875,000 visits were counted at Herring Cove Beach in 2012. The months of June through September account for approximately 575,000 visits (NPS 2013).

The summer months are the busiest time at Herring Cove Beach. The Herring Cove Beach is one of six swimming beaches in the seashore and is lifeguarded from late June through the August. Beach goers consistently fill both north and south parking lots by midday from late June through Labor Day. Visitors enjoy swimming, walking, and fishing. A large number of right whales that feed off the ocean beaches around Race Point Beach into Cape Cod Bay have been observed in the spring. There are times in late March and April that visitation at Herring Cove and Race Point Beaches spikes due to the whale activity. These spring spikes usually only last for a couple days when the whales are feeding in close proximity to the beach (Thatcher 2013).

The two parking lots at Herring Cove Beach are open year-round between 6am and midnight and have a total of 575 parking spaces, including 19 spaces for disabled permit holders. The North parking lot (the parking lot) currently offers four spaces for disabled permit holders and five spaces for long vehicles such as recreational vehicles. The parking lot is the only parking area in the seashore that with spaces that provide a direct view of Cape Cod Bay. Approximately 200 parking spaces in the parking lot are on the waterfront. Providing direct access to the beach makes the parking lot particularly popular with visitors. Elderly and disabled visitors have the opportunity to visit the beach and see the bay without having to walk long distances from their vehicles. During winter months, visitors appreciate the convenience of staying in their vehicles while watching sunsets, whale watching, and enjoying short trips to the seashore.

The proximity of the Herring Cove North parking lot to the bay makes it particularly susceptible to wave and flood damage. Both the parking lot and the associated asphalt revetment experienced extensive damage in late December 2011, during a season with above average visitation. As a result, some parking spaces could not be used until emergency repairs took place because the integrity of the asphalt caused safety concerns.

Adjacent to the Herring Cove Beach South parking lot, the national seashore provides restrooms, a bathhouse, and the Herring Cove Snack Bar, all of which are open seasonally. At the northern end of the Herring Cove North parking lot, a vault toilet is available year-round.

Visitors enjoy the convenience of having immediate access to the beach from the Herring Cove North parking lot.

The NPS provides a vault toilet at the northern end of the Herring Cove North parking lot.

Herring Cove Beach can also be accessed by bicycle. Visitors travelling from Provincetown to the south can ride along the recently added bicycle lanes along Moors Road. Visitors can also connect to the Province Lands Bicycle Trail at the northern end of the Herring Cove North parking lot. Bicycle parking is provided at the southern end of the South lot. Because the parking lots connect the bicycle trails north and south of Herring Cove Beach, visitor safety is a potential concern, especially in the narrow Herring Cove North parking lot. Bicyclists, particularly children, riding through the parking lot may be difficult for drivers to see, especially on busy days. Also, shifting sands from the dunes can cause hazardous riding conditions.

Bicyclists use the Herring Cove North parking lot to connect to the Province Lands Bicycle Trail.

SOCIOECONOMICS RESOURCES AND ADJACENT LANDS

Herring Cove Beach is located in Barnstable County near Provincetown, at the northern tip of Cape Cod. Accommodations and food service sales in Barnstable County accounts for approximately $8.9 million in spending annually (based on 2007 data, Census Bureau 2011). According to an analysis of national park visitation, visitors to the national seashore spent more than $170 million in the local

economies in 2010. The contribution of this spending is estimated to have provided the need for approximately 1,856 jobs in the area (NPS 2010a).

Tourism is an integral part of the local economy, and the region has strong cultural ties to water. Both Provincetown and Herring Cove Beach are award-winning tourist destinations. Most recently, Herring Cove Beach received three gold awards from *Cape Cod Life Magazine*'s readers' choice "Best of 2013" awards: Best Beach on the Outer Cape, Best Sunset View on the Outer Cape and Best Picnic Spot on the Outer Cape. Visitors and seasonal residents help to support the livelihood of many business owners in Provincetown.

Provincetown is home to approximately 3,000 year-round residents (Census Bureau 2011), while the summer population is 30-40,000 people (Provincetown Chamber of Commerce 2013). A variety of recreational and leisure activities are available to Provincetown visitors, one of which is Herring Cove Beach; only one mile from town, it is readily accessible by motor vehicle and by bicycle.

OPERATIONS AND INFRASTRUCTURE

Herring Cove Beach is accessed from Province Lands Road, one tenth of a mile northwest of the intersection with Route 6. A stretch of two-lane access road, approximately two tenths of a mile in length, connects the North and South lots and intersects with the entrance road to Province Lands Road. The Herring Cove Beach area also includes an entrance fee booth, two parking lots, a bathhouse, and a concession stand. These facilities, in addition to a 1-mile macadam/asphalt revetment (seawall), were constructed by the Commonwealth of Massachusetts in the 1950s and 60s.


Entrance fee booth at Herring Cove Beach.

As one of the most popular areas in the Seashore, Herring Cove Beach has visitors at all times of year with peak season being July and August. The Herring Cove parking lots are open from 6am to midnight, year-round. The entrance fee booth is open and staffed from 7am to 5pm on from June 21 through September 2 with four weekends preceding and following the open season. The beach is lifeguarded from late June through August. The bathhouse and two vault toilet facilities are closed during the winter months.

Installation of the existing 1-mile asphalt revetment in 1965.

Most of the Herring Cove Beach South lot is protected from flood and wave damage by sand dunes; however, the Herring Cove North parking lot is protected only by the revetment, with the primary dunes located east of the parking lot. Until their removal in 2007, four groins, rock structures built perpendicular to the shore to capture sand, helped to prevent sand transfer to the south but increased erosion in other areas. Erosion of Herring Cove Beach is estimated to average 2.5 feet per year.

Both the parking lot and the associated 1-mile asphalt revetment, which extends the entire length of the Herring Cove Beach shoreline, experienced extensive damage in late December 2011 during a winter storm. The national seashore cannot replace portions of the existing revetment because current coastal zone policies do not support such an action without extensive environmental permitting. The Herring Cove North parking lot runs northwest parallel to Province Lands Road for approximately 0.4 miles, providing approximately 200 west-facing parking spaces. The lot is heavily used as demonstrated by the fact that it consistently fills to capacity by midday in the summer months. Windblown sand is removed each spring after the winter storms blow sand into the parking lot. There is a substantial accumulation some years. The Maintenance Division of the national seashore disperses the sand annually with heavy equipment to the beach and dune.

Sand accumulates in the Herring Cove Beach North parking lot and must be cleared by park maintenance staff.

The Province Lands Bicycle Trail emerges from the Province Lands at the northern end of the parking lot. The Herring Cove parking lots serve as a bicycle route connection between this trailhead and more

southern destinations such as Provincetown. The bicycle route is indicated by faded pavement markers and runs along an area shared by motor vehicles within the parking lot. No separate bicycle lanes are currently provided between Moors Road (with its recently added bicycle lanes) and the Province Lands Bicycle Trail trailhead.

Since 1965, there have been a series of repairs to the Herring Cove Beach facilities. In 1965 the NPS undertook revetment and groin repair, which needed modest repair again in 1983. Reconfiguration of the fee booth entry and south parking lot, and elimination of the rotary were completed in 1984. The intersection configuration was upgraded again in 2009 to make it less dangerous by eliminating the traffic island and tapering from 4 to 2 lanes. In 2010, minor pavement repair/sealing occurred in the parking lots and revetment, and temporary stairs were installed; prior parking lot patching and stair work had also occurred based on posts and other evidence, but records for some of those small routine repairs are unavailable.

4

ENVIRONMENTAL CONSEQUENCES

This "Environmental Consequences" chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this EA. This chapter also includes methods used to analyze direct, indirect, and cumulative impacts. A summary of the environmental consequences for each alternative is provided in table 2, which can be found in "Chapter 2: Alternatives." The resource topics presented in this chapter and the organization of the topics correspond to the resource discussions contained in "Chapter 3: Affected Environment."

GENERAL METHODOLOGY FOR ANALYZING IMPACTS

In accordance with the CEQ regulations, direct, indirect, and cumulative impacts are described under each impact topic (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary; therefore, these methodologies are described under each impact topic.

GEOGRAPHIC AREA EVALUATED FOR IMPACTS

The geographic project area is generally defined as an area of approximately 22 acres surrounding and adjacent to the existing parking lot, revetment, and Province Lands Road (figure 2). This area is generically referred to as Herring Cove Beach North. The project area includes approximately one mile of shoreline from the north Herring Cove parking lot to in front of the Herring Cove Beach bathhouse and Herring Cove Beach South parking lot. The project area extends from the shoreline to approximately 400 feet inland to Province Lands Road and its environs. Where a wider geographic project area is appropriate for a particular impact topic (e.g., to incorporate the wider Herring Cove Beach area, local transportation connections, and/or other resources), that wider geographic area is defined under the methodology for that impact topic.

TYPE OF IMPACT

Impacts are discussed by type, as follows (the terms "impact" and "effect" are used interchangeably throughout this document):

Direct: Impacts that would occur as a result of the proposed action at the same time and place of implementation (40 CFR 1508.8).

Indirect: Impacts that would occur as a result of the proposed action but later in time or farther in distance from the action (40 CFR 1508.8).

Adverse: An impact that causes an unfavorable result to the resource when compared to the existing conditions.

Beneficial: An impact that would result in a positive change to the resource when compared to the existing conditions.

CUMULATIVE IMPACT ANALYSIS METHODOLOGY

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). As stated in the CEQ handbook, *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997), cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on impacts that are truly meaningful. Cumulative impacts are considered for all alternatives, including alternative A, the no-action alternative.

Cumulative impacts were determined for each affected resource by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable actions that would also result in beneficial or adverse impacts. Because some of these actions are in the early planning stages, the evaluation of the cumulative impact is based on a general description of the projects. These actions were identified through the internal and external project scoping processes and are summarized below.

Past, Present, and Reasonably Foreseeable Actions

Province Lands Bicycle Trail Renovations. The *Province Lands Bicycle Trail Renovations EA* was completed in December 2006. This plan calls for renovation of the 7.34 miles of the loop and its spur trails to address general design deficiencies, improve safety, and enhance resource protection (NPS 2006b). Since the completion of the EA, the first stage of renovations has been completed, and the second stage is currently underway. This trail has a main terminus at the Herring Cove North parking lot and therefore is both an attraction for visitors already within the project area and also draws visitors to the project area from other locations. The project has previously and currently impacted and has the potential to impact public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure.

Rehabilitation of Moors Road with Bicycle Accommodations in the Province Lands. This project resulted in widened lanes on both sides of Moors Road within the national seashore from the boundary

nearest Provincetown to the crosswalk where the bicycle trail connects through the dunes to the Herring Cove Beach South parking lot. The project improved accommodations for bicycles along this route, and in doing so, provided increased safety for pedestrians. The project was completed in 2010 and has the potential to impact public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure.

Cape Cod National Seashore Integrated Bicycle Feasibility Study. This study, otherwise known as the *Integrated Bicycle Plan* (VHB 2010), was completed in 2010. It will help assure that the national seashore attractions, town centers, available transit systems, and other bicycle facilities are connected in an efficient manner and that NPS efforts are coordinated with proposals by the Commonwealth of Massachusetts and local communities. The study identifies potential projects to continue the region's investment in bicycle facilities both outside and inside the national seashore, creating more effective bicycle links to the national seashore and between localities such that a unified and integrated bicycle network can be developed to help mitigate the reliance on automobile travel, particularly for short trips and when visiting national seashore destinations. One such segment would connect to Herring Cove beach along U.S. Route 6 from Race Point Road. This action has the potential to impact public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure.

Rebuild Herring Cove Beach Facilities. This project replaced the Herring Cove Beach facilities next to the Herring Cove Beach South parking lot. The original facilities were constructed in the 1950s by the Commonwealth of Massachusetts as a state park headquarters and beach facility with bathrooms, dressing rooms, lifeguard station, first aid room, snack bar, and boat house, as well as office and storage space for the state park. This large two story building (approximately 4,100 square feet) and the two small side buildings (300 square feet and 500 square feet) were in need of removal because the sand in front of the structures was being washed away by the tides of Cape Cod Bay. Foundations were settling and cracking, making the buildings unstable and unsafe. The project removed these structures and replaced them with a new energy efficient modular building system that can be relocated in the future as determined by experts in the field of beach and dune migration and deterioration. This development has the potential to impact coastal processes, public use and experience, socioeconomic resources and adjacent lands, and operations and infrastructure.

In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

Imperceptible: The incremental effect contributed by the alternative to the overall cumulative impact is such a small increment that it is impossible or extremely difficult to discern.

Noticeable: The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impact.

Appreciable: The incremental effect contributed by the alternative constitutes a large portion of the overall cumulative impact.

ASSESSING IMPACTS USING CEQ CRITERIA

The impacts of the alternatives are assessed using the CEQ definition of "significantly" (1508.27), which requires consideration of both context and intensity:

(a) **Context** – This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) **Intensity** – This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

(1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect would be beneficial.

(2) The degree to which the proposed action affects public health or safety.

(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime farmlands, wetland, wild and scenic rivers, or ecologically critical areas.

(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

(10) Whether the action threatens a violation of federal, commonwealth, or local law or requirements imposed for the protection of the environment.

For each impact topic analyzed, an assessment of the potential significance of the impacts according to context and intensity is provided in the "Conclusion" section that follows the discussion of the impacts under each alternative. Resource-specific context is presented in the "Methodologies" section under each resource topic and applies across all alternatives. Intensity of the impacts is presented using the relevant factors from the list in (b) above. Intensity factors that do not apply to a given resource topic and/or alternative are not discussed.

NATURAL AND PHYSICAL RESOURCES

COASTAL PROCESSES

Methodology

Potential impacts on coastal processes are assessed based on an evaluation of the historic patterns of longshore currents and sediment transport, coastal erosion, and interactions between the beach and the dunes behind (east of) the existing parking lot, as described in chapter 3. Resource-specific context for assessing impacts of the alternatives on coastal processes includes:

- Cross-shore sediment transport is essential to the natural exchange of sediment between the seasonally variable areas of sediment storage.
- Longshore sediment transport can cause either a net gain or loss of sediment over time, depending on surrounding conditions.
- Appreciation of the natural features of Cape Cod is also part of the national seashore's enabling legislation. The expansive dunes of the Province Lands are a unique example of the national seashore's natural features.
- The Province Lands spit dune fields comprise approximately 4,000 acres.
- The park's enabling legislation states that "the seashore shall be permanently preserved in its present state," which is interpreted by the NPS as generally limiting development to the level that existed at the time of the legislation's enactment. Preservation would include a mixture of resources and activities that could change but must remain comparable in character and scale to that in existence in 1961 (NPS 1998).

Alternative A: No-action

Impacts

Under the no-action alternative, the national seashore would maintain the existing asphalt revetment and parking lot in their existing locations for as long as possible. These structures would continue to disrupt the flow of sand between the foreshore and the dunes for the approximately 1-mile length of the revetment. During storm events, the sand from the backshore/dunes that would otherwise contribute to the nearshore sediment budget is stored out of reach of moderate storm events, on the eastern side of the

parking lot. When the shoreline should be in a period of "recovery," where sand moves onshore and is stored in dunes, some of this sand is lost to longshore currents instead, due to the separation of the vegetated dunes from the foreshore. This tends to accelerate rates of shoreline erosion.

Although the parking lot and revetment would be repaired as long as feasible, as sections of the parking lot become structurally unsafe, they would be abandoned and the asphalt would be removed and disposed of offsite. Coastal processes would be free to resume in these areas, but the restoration of natural sediment movement in these areas may cause accelerated erosion in adjacent areas. If the entire parking lot were to be abandoned during the 25 year period being considered in this document, the movement of sand within the project area (both cross-shore and longshore) would resume, unimpeded by manmade structures.

Cumulative Impacts

The only other past, present, or reasonably foreseeable action that has had or would have impacts on coastal processes within the project area is the reconstruction of the Herring Cove Beach facilities. Recent reconstruction of these facilities relocated these buildings inland from the shoreline where more natural coastal processes could be restored behind the existing asphalt revetment. For instance, dunes can now be established behind the existing asphalt revetment, and these dunes could facilitate seasonal cross-shore sediment transport. Restoration of coastal processes in this area would have a beneficial impact on coastal processes. The impact of alternative A, in conjunction with the impacts of this other action, would result in an adverse cumulative impact on coastal processes. Alternative A would contribute an appreciable adverse increment to the overall cumulative impact.

Conclusion

Overall, alternative A would have continued adverse impacts on the coastal processes within the project area. Both cross-shore and longshore sediment transfer processes would be interfered with by the continued presence of the asphalt revetment and parking lot. This inhibition is likely to cause faster rates of coastal erosion in this area in comparison to the more natural shorelines to the north and south of the project area; however, the overall Province Lands spit dune fields as a whole would not be noticeably impacted. The national seashore would preserve coastal processes to the extent possible, but the character and scale of the parking lot would remain as it was when the national seashore was created, although sections and ultimately the entire parking lot would be lost to coastal erosion. Alternative A would contribute an appreciable adverse increment to the overall adverse cumulative impact on coastal processes. The adverse impacts of alternative A would not likely be significant because of the overall resilience of dynamic coastal systems and the potential restoration of coastal processes as portions of the parking lot were permanently closed and abandoned due to structural instability.

Alternative B: Periodic Retreat

Impacts

Under alternative B, the NPS would regrade the project area and replace the existing asphalt structures with a moveable parking lot (constructed with either concrete or crushed shells) at a higher elevation (15 feet). A low-crested berm would be constructed west of the parking lot. The parking lot would be moved back (eastward) approximately 25 feet every 10 years.

Creating a dune (in the form of an artificially created sandy berm) would be meant to serve two purposes: to protect the new parking lot and to restore more natural sediment transport in the project area. The existing dune would be redistributed to support the new parking lot and to create the new dune. This would shift the dune from its current location where it is disconnected from the foreshore to a location in front (west) of the new parking lot. This would place the dune adjacent to the foreshore and backshore areas of the beach, which would allow for unimpeded sediment transport between these zones. The dunes would function to store sand during periods of "recovery." During storm events, that dune would be wave-cut before the parking lot.

The new dune would be monitored to understand how it is functioning in the sand sediment transport system and in providing buffering during storms. Some vegetative planting to stabilize the sand may take place, and biodegradable jute or low fencing would also be considered. However, national seashore managers would also ensure that views of the water remained possible from the parking lot.

Although cross-shore sediment transport would take place more naturally (uninhibited by manmade structures) under this alternative than under alternative A, natural longshore sediment transport would continue to cause erosion of the shoreline at an average rate of 2.5 feet per year. Therefore, over a period of approximately 10 years, the dune would be eroded and the shoreline would once again approach the parking lot. The retreat of the parking lot would ideally be timed prior to adverse impacts on the integrity of the parking, thus allowing the natural shoreline to begin to reestablish itself and not be disrupted by excavation due to debris removal. However, in the case of a sudden storm, which can often be the case, the parking lot would not store sediment as a dune is intended to, and the natural cross-flow of sand within the project area would once again be impeded by manmade structures.

This alternative would result in recurring construction periods in an effort to respond to coastal change. During construction, exposed, non-vegetated areas would be subject to erosion by wind and water, although efforts would be made to avoid any large volumes of sand. During the initial parking lot reconstruction period, approximately 4.34 acres of sand will be exposed (approximately 28,400 cubic yards would be graded). Following initial reconstruction, periodic retreat of the parking lot would take place once approximately every 10 years. During each parking lot retreat, approximately 1.2 acres of sand would be exposed. Installation of the bicycle lanes along Province Lands Road and installation of a shade structure would require a one-time exposure of approximately 0.46 acres of sand during construction; this exposure would not be recurring. Staging would take place on paved surfaces, where available, to avoid impacts outside the bounds of previously disturbed areas. The impacts on vegetation are addressed under that impact topic.

Cumulative Impacts

The reconstruction of the Herring Cove Beach facilities has the potential to contribute to the cumulative impact on coastal resources within the project area. The beneficial impacts described under alternative A, along with alternative B, would have a beneficial cumulative impact on coastal processes. Alternative B would contribute an appreciable beneficial increment to cumulative impacts on coastal processes.

Conclusion

Overall, alternative B would have recurrent adverse impacts on coastal processes interspersed by beneficial impacts on coastal processes. Initial reconstruction of the parking lot would disrupt the

currently established landscape to establish the new parking lot and the new dune. During this time, some exposed sands may be lost to erosive forces and would therefore be lost to the sediment budget. However, following the initial establishment of the new parking lot, it is expected that both cross-shore and longshore sediment transport processes would be restored to some extent. Because it may take some time for the new dune to fully function as a natural dune in terms of sediment storage, coastal erosion rates may rise initially before returning to a more natural equilibrium driven by processes outside the project area; however, such a rise in coastal erosion may not be noticeable, given the broader geologic processes of the Province Lands spit. The overall coastal processes of the Province Lands spit would remain unaffected. Although the national seashore would attempt to execute the periodic parking lot retreats without disturbing the dune and the shoreline west of it, there is the possibility that coastal processes may be interrupted periodically, associated with the periodic retreats (approximately once every 10 years). The national seashore would preserve coastal processes to the extent possible, but the character and scale of the parking lot would remain as it was when the national seashore was created, with periodic retreats meant to remove infrastructure periodically from a location where it interferes with natural coastal processes. Alternative B would contribute an appreciable beneficial increment to the overall beneficial cumulative impact on coastal processes. These impacts would not likely be significant because the restoration would be gradual (and, if disturbed, recurring) and would move the system towards a more natural state.

Alternative C: One-time Retreat (NPS Preferred)

Impacts

Under alternative C, the NPS would regrade the project area and replace the existing asphalt structures with a an asphalt parking lot of the same size, 125 feet eastward, and at a higher elevation (15 feet). As part of the grading of the project area, the existing dunes would be redistributed to support the new parking lot, to fill in the area formerly occupied by the existing parking lot, and to provide a small (approximately 3 feet high) sandy berm in place of the existing asphalt revetment.

As under alternative B, the foredune would be reestablished west of the parking lot (and some vegetative planting to stabilize the sand may take place, and biodegradable jute or low fencing would also be considered). Although cross-shore sediment transport would take place more naturally (uninhibited by manmade structures) under this alternative than under alternative A, natural longshore sediment transport would continue to cause erosion of the shoreline at an average rate of 2.5 feet per year. Unlike alternative B, reconstruction of the parking lot would take place 125 feet eastward of the existing parking area. Therefore, the new dune would have considerably more distance available for migration inland before encountering the new parking lot. The distance from the parking lot and the singular reconstruction event would also allow the dune to revegetate generally free from disturbance. This alternative would have the benefit of being a one-time, longer term coastal change adaptation response.

The disturbances to which the dune would be subject (following initial construction) would be limited to visitor foot traffic and any maintenance needed to maintain a water view from the parking lot. For these reasons, a greater restoration of natural coastal processes would be expected under this alternative than under the other alternatives. The more stabilized shoreline would be more resilient in response to storm surges. With the manmade structures removed from the more active zone of sediment transfer, sand would be redistributed to assume a smooth curve with the adjacent beaches.

The top picture shows the existing shoreline, and the bottom picture is a photographic simulation (using Google Earth imagery) of the shoreline under alternative C. The actual appearance following implementation may differ from this simulation due to natural variation and minor changes to parking and roadway design during future planning stages.

During initial construction, approximately 7.16 acres of sand would be exposed (28,400 cubic yards would be graded) and would be at risk for loss from the sediment budget within the project area; 2.82 acres would be exposed for construction of the new parking lot and associated bike path, and 4.34 acres would be exposed during demolition of the existing parking lot and revetment.

Cumulative Impacts

The reconstruction of the Herring Cove Beach facilities has the potential to contribute to the cumulative impact on coastal resources within the project area. The beneficial impacts described under alternative A, along with alternative C, would have a beneficial cumulative impact on coastal processes. Alternative C would contribute an appreciable beneficial increment to cumulative impacts on coastal processes.

Conclusion

Overall, alternative C would have temporary adverse impacts during demolition/construction followed by beneficial impacts as coastal processes are restored. During construction, the sediment budget may be reduced as approximately 7.16 acres are exposed during demolition/construction. However, following the initial establishment of the new parking lot, it is expected that both cross-shore and longshore sediment transport processes would be restored to a large extent. Because it may take some time for the new dune to fully function as a natural dune in terms of sediment storage, coastal erosion rates may rise initially before returning to a more natural equilibrium driven by processes outside the project area (again, this change may not be detectable). The national seashore would preserve coastal processes to the extent possible, but the character and scale of the parking lot would remain as it was when the national seashore was created, but relocated approximately 125 feet eastward. The overall coastal processes of the Province Lands spit would remain unaffected. Alternative C would contribute an appreciable beneficial increment to the overall beneficial cumulative impact on coastal processes. These impacts would not likely be significant because the restoration would be gradual and would move the system towards a more natural state.

VEGETATION

Methodology

Potential impacts on vegetation are assessed based on the species composition typical to the vegetative communities found within the project area, as described in chapter 3. Resource-specific context for assessing impacts of the alternatives on vegetation includes:

- Plants within the project area are part of the larger, continuous, diverse ecosystem within the Province Lands spit.
- Vegetation is the basis of the ecological community, meaning that other important resources (such as coastal processes) depend on vegetation.
- The national seashore's enabling legislation, which states that "the seashore shall be permanently preserved in its present state," which is interpreted by the NPS as generally limiting development to the level that existed at the time of the legislation's enactment. Preservation would include a mixture of resources and activities that could change but must remain comparable in character and scale to that in existence in 1961 (NPS 1998)

Alternative A: No-action

Impacts

Under the no-action alternative, the national seashore would maintain the existing infrastructure to the extent possible. The dune pioneer and shrub/thicket vegetation on the dune between the parking lot and Province Lands Road would continue to be subject to coastal wind and waves, although they are somewhat protected from storm events by the existing asphalt revetment. Vegetation would continue to be disturbed where it tries to colonize the shifting sands adjacent to the parking lot as that accumulated sand is removed during regular maintenance activities. Impacts would be limited to a few individuals along approximately 2,000 feet along the eastern edge of the parking lot, which is cleared of sand

annually (and as needed). As the parking lot becomes structurally unstable, sections would be abandoned. In these sections vegetation may be able to take root and become established.

Cumulative Impacts

No other past, present, or reasonably foreseeable future actions have the potential to impact vegetation within the project area; therefore, there are no cumulative impacts on vegetation within the project area.

Conclusion

Overall, under alternative A vegetation would continue to be both adversely and beneficially impacted by the existing infrastructure. The existing infrastructure would continue to prevent dune pioneer vegetation from taking root in approximately 4.34 acres, and maintenance of this infrastructure would also cause indirect disturbance of vegetation as it attempts to colonize recently exposed sands near the parking lot; however, the asphalt revetment would continue to provide some protection of the dune vegetative community from wave action during storms and vegetation could become reestablished in areas where the parking lot and revetment are abandoned and removed. The national seashore would preserve vegetation to the extent possible, but the character and scale of the parking lot would remain as it was when the national seashore was created, although sections and ultimately the entire parking lot would be lost to coastal erosion. These impacts would not likely be significant because the amount of disturbance and displacement of vegetation is relatively small (limited to a small number of individual plants) within the context of the diverse ecosystem of the Province Lands and because the existing vegetation within the project area would continue to play an important role in sediment storage in the dune community.

Alternative B: Periodic Retreat

Impacts

Under alternative B, the national seashore would replace the existing parking lot with a new moveable parking lot made from either concrete planks or natural materials such as crushed shell. The new parking lot would be elevated to a height of 15 feet, and a sandy berm would be constructed on the western side of it for protection and restoration of coastal processes, as discussed above. The new parking lot (approximately 2.4 acres) would displace only slight more vegetation than currently displaced by the existing parking lot under alternative A (2.1 acres); however, the removal of the revetment would result in approximately 2.3 acres being made available for establishment of vegetation.

During initial parking lot reconstruction under this alternative, the national seashore would regrade the existing dune that runs along the eastern edge of the existing parking lot. Initial grading of this dune would result in the disturbance of approximately 2.8 acres of dune vegetation. Although this vegetation is accustomed to disturbance, it is unlikely that many plants would survive the regrading. Some vegetative planting to stabilize the sand may take place, and biodegradable jute or low fencing would also be considered. If possible, the national seashore would retain natural vegetation on the dune; however, the national seashore would maintain a view of the water from the parking lot, which may occasionally require minor grading of the dune, accompanied by disturbance to any present vegetation.

The parking lot would retreat from the shore approximately 25 feet every 10 years. In order to achieve this, the national seashore would clear, grade, and pave an approximately 25-foot swath behind (to the

east of) the parking lot. During each retreat, this would result in approximately 1.2 acres of disturbance. Any dune pioneer or scrub/thicket species that had become reestablished in this area would be removed each time, but a comparable area would be available for reestablishment of vegetation on the western side of the parking lot in the 1.2 acres that from which the parking lot would be removed as it retreats from the shoreline. Visitors walking through this area to reach the beach may cause trampling of some plants, and there is the potential for overwash as natural shoreline erosion brings the shoreline closer to the parking lot over time.

The park would maintain the vault toilet within the project area and would install a shade shelter and orientation signs nearby. The area of disturbance and displacement of vegetation that would be associated with relocating the vault toilet and installing these other items is included within the acreages described above for the parking lot improvements. It is possible that these items may need to be shifted east with the parking lot. Whether or not these items require shifting back with the parking lot would be determined at a future date.

In addition to the change in parking lot arrangement, the national seashore would add 5-foot bicycle lanes on both sides of Province Lands Road. This would also require some grading and some disturbance and/or removal of some vegetation in both the dune pioneer and shrub/scrub communities as well as possibly encroaching on the sandplain heathland community. The addition of bicycle lanes would displace approximately half an acre of additional area along the roadway, and some temporary disturbance of vegetation may take place beyond this area where grading is needed to support the bicycle lanes.

Cumulative Impacts

No other past, present, or reasonably foreseeable future actions have the potential to impact vegetation within the project area; therefore, there are no cumulative impacts on vegetation within the project area.

Conclusion

Overall, alternative B would have adverse impacts on vegetation due to the displacement, removal, and/or disturbance of several acres of vegetation within the project area. Conversely, alternative B would also have beneficial impacts on vegetation due to demolition activities that would provide exposed soil where natural vegetation could become reestablished. The initial grading and construction would result in the removal of the existing coastal scrub vegetation in an area of approximately 2.8 acres plus an additional 0.5 acres on both sides of Province Lands Road. These impacts would take place primarily within dune pioneer and shrub/scrub communities with the possibility of impacting some sandplain heathland species. The parking lot would displace approximately 3.4 acres of potential vegetation; but the 2.3 acres currently occupied by the asphalt revetment would be available for revegetation. After the initial construction, an additional 1.2 acres of vegetation would be subject to disturbance to the east while 1.2 acres would be available for pioneer dune vegetation to become established to the west; this pattern of clearing and revegetation would occur approximately once every 10 years. The national seashore would include a post-construction assessment in their work plan for a year after any construction disturbance and would eradicate invasive species mechanically (by hand) at that time to mitigate against the establishment of undesirable vegetation. The national seashore would preserve vegetation to the extent possible, but the character and scale of the parking lot would remain as it was when the national seashore was created, although it would be shifted back from the shoreline periodically. These impacts would not likely be significant because the amount of disturbance and displacement of vegetation is relatively small within

the context of the diverse ecosystem of the Province Lands and because the remaining vegetation and any newly established vegetation within the project area would play an important role in sediment storage in the dune community.

Alternative C: One-time Retreat (NPS Preferred)

Impacts

Under alternative C, the national seashore would replace the existing parking lot with a new asphalt parking lot located 125 feet inland (east) and at an elevation of 15 feet. As under alternative B, a sandy berm would be constructed on the western side of the parking lot for protection and for restoration of coastal processes.

The new parking lot (approximately 2.4 acres) and an adjacent 10-foot wide bicycle route (0.5 acres) would displace slightly more vegetation than the existing parking lot (2.1 acres), and this displacement would be shifted 125 feet east of the existing parking lot location. During construction of the new parking lot, the national seashore would regrade the existing dune that runs along the eastern edge of the existing parking lot. Grading of this dune would result in the disturbance of approximately 5.4 acres of vegetation. Although this vegetation is accustomed to disturbance, it is unlikely that much would survive the regrading. Some vegetative planting to stabilize the sand may take place, and biodegradable jute or low fencing would also be considered. If possible, the national seashore would retain natural vegetation on the dune; however, the national seashore would maintain a view of the water from the parking lot, which may occasionally require minor grading of the dune, accompanied by disturbance to any present vegetation.

Following completion of the new parking lot, the existing parking lot and revetment would be demolished, and the new berm would be formed in that approximate location. Following demolition, construction, and grading activities, this area would be available for dune pioneer species to become reestablished along this entire area (including the 4.3 acres occupied by the existing parking lot and revetment as well as the area between that and the new parking lot). Similarly to alternative B, visitors walking through this area to reach the beach may cause trampling of some plants, and there is the potential for overwash as natural shoreline erosion brings the shoreline closer to the parking lot over time. However, unlike alternative B, the newly vegetated berm should have room to adapt with the natural shoreline change during the 50 year life of the parking lot.

As under alternative B, the park would maintain the vault toilet within the project area and would install a shade shelter and orientation signs nearby. The area of disturbance and displacement of vegetation that would be associated with relocating the vault toilet and installing these other items is included within the acreages described above for the parking lot improvements. Under this alternative, the construction of these items is expected to be a one-time event.

Unlike alternative B, alternative C would not require any additional modifications or movements of the parking lot following initial construction. This one-time construction combined with the distance from the shore would provide the greatest chance for pioneer and shrub/thicket vegetation to recover on the western side of the new parking lot. Ultimately, a more natural vegetative community could be reestablished in this area that would essentially replace the existing dune, which is subject to manmade constraints.

The relocation of the parking lot would require an approximately 450-foot length of Province Lands Road to be shifted east during construction. This would result in approximately 0.3 acres of vegetation to be disturbed. The vegetation in this area is a sandplain heathland, with a high proportion of lichen species. This association is very sensitive to disturbance; therefore, this association would take many years to recover, if recovery takes place at all.

Cumulative Impacts

No other past, present, or reasonably foreseeable future actions have the potential to impact vegetation within the project area; therefore, there are no cumulative impacts on vegetation within the project area.

Conclusion

Overall, alternative C would have adverse impacts on vegetation due to the displacement, removal, and/or disturbance of several acres of vegetation within the project area. Conversely, alternative B would also have beneficial impacts on vegetation due to demolition activities that would provide exposed soil where natural vegetation could become reestablished west of the new parking lot. The initial grading and construction would result in the removal of the existing coastal scrub vegetation in an area of approximately 5.4 acres. These impacts would take place primarily within dune pioneer and shrub/scrub communities with the possibility of impacting some sandplain heathland species. The parking lot and bicycle route would displace approximately 2.9 acres of potential vegetation; but the 4.3 acres currently occupied by the parking lot and revetment would be available for revegetation. As under alternative B, the national seashore would include a post-construction assessment in their work plan for a year after any construction disturbance and would eradicate invasive species mechanically (by hand) at that time to mitigate against the establishment of undesirable vegetation. The national seashore would preserve vegetation to the extent possible, but the character and scale of the parking lot would remain similar to what it was when the national seashore was created. These impacts would not likely be significant because the amount of disturbance and displacement of vegetation is relatively small within the context of the diverse ecosystem of the Province Lands and because the remaining vegetation and any newly established vegetation within the project area would play an important role in sediment storage in the dune community.

FLOODPLAINS

Methodology

Potential impacts on floodplains are assessed based on the preliminary map update posted by the Federal Emergency Management Agency in May 2013, as described in chapter 3. Floodplain impacts are characterized both by the flow of water through the floodplain as well as the risks to human safety caused by potential flood events.

Resource-specific context for assessing impacts of the alternatives on floodplains includes the following:

- Floodplain functions and values (store floodwaters, minimize erosion of adjacent soils, provide riparian habitat, etc.) are intrinsic to floodplains and cannot be easily duplicated or replaced.

- Executive Order 11988 directs all federal agencies to avoid long and short-term impacts associated with occupancy, modification and development of floodplains when possible.
- NPS DO-77-2 implements Executive Order 11988 and established NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding.

Alternative A: No-action

Impacts

Under the no-action alternative, the NPS would retain the existing facilities within the project area in their current locations. The parking lot would continue to be at an elevation of approximately 10 feet. The base flood elevation for this area is 14 feet. Therefore, the revetment and parking lot would be subject to flooding during 100-year storm events, with increasing frequency as erosion of the beach and sea-level rise continue. The revetment and the parking lot surface would be subject to relatively high energy wave action during these events due to their increasing proximity to the shore. The national seashore would close sections of the parking lot as asphalt integrity failed over time, although efforts would be made to repair the structures as long as is practical. In maintaining structures in this location, the national seashore would maintain up to 21,000 square yards of asphalt in a structure that would continue to impede the flow of flood waters through the project area. Infiltration of floodwaters would be inhibited by the asphalt surface. During flood events, water levels would rise more quickly where impervious structures block the landward flow of water. Therefore, the areas on both sides (especially the north side) of the parking lot may be subject to scour due to relatively high water velocity during flood events. As sections of the parking lot are abandoned, this areas would also be subject to scour due to increased wave energy in areas where waves runup against the surrounding asphalt revetment.

The vault toilet is currently slightly higher than the 100-year floodplain; however, it is located in an area that could be subject to scour during increasingly frequent storm events. In order to keep this structure out of the floodplain, the NPS would address this structure as needed and on its own (not as part of a larger comprehensive plan for the site).

The beach parking lots would continue to be closed during storms. If there were a concern for public safety this would be done, or specific sections would be barricaded off. The national seashore has a major storm and hurricane plan, and this discusses what procedures are to be followed based on predicted storm severity. Sometimes a small section at the entry to the lot is left open for storm watchers when it is safe to do so. Storms that are expected to cause flooding in this area include hurricanes and nor'easters; the national seashore is provided with sufficient time to close this area prior to the arrival of these storms.

Cumulative Impacts

No other past, present, or reasonably foreseeable future actions have the potential to impact floodplains within the project area; therefore, there are no cumulative impacts on floodplains within the project area.

Conclusion

Overall, alternative A would result in continued adverse impacts on floodplains due to the maintenance of human-made structures and impervious surface that impede the flow of water within the 100-year floodplain. Attempting to maintain these structures would require that storm surge travel over and around the revetment and parking lot as coastal erosion and sea-level rise brought the shoreline closer to the

parking lot over the next 50 years. Hazardous conditions associated with flooding would be present; however, the national seashore would not allow staff or public into the project area if flooding was expected or present. The adverse impacts of alternative A on floodplains would not likely be significant because the dynamic coastal ecosystem would accommodate the altered flow of flood waters through other highly adaptable (and uninhabited) areas, although these areas would not replace the function of a natural floodplain within the project area. There would continue to be an extremely low risk to human safety associated with flooding events within the project area.

Alternative B: Periodic Retreat

Impacts

Under alternative B, the NPS would regrade the project area and replace the existing asphalt structures with a moveable parking lot (constructed with either concrete or crushed shells) at a higher elevation (15 feet). The parking lot would be moved back (eastward) approximately 25 feet every 10 years. The national seashore would relocate the vault toilet to a higher elevation along with the parking lot to minimize the chance of inundation and would continue to consider the need for relocation during each periodic move. Additional structures (e.g., a shade shelter and additional orientation signs) would also be maintained outside of the floodplain.

Demolition of the existing revetment and parking lot would remove these structures from the floodplain. The new parking lot would be elevated to remove it from the 100-year floodplain; however, the sand supporting it would remain subject to wave action during storms of this intensity. As part of the construction, sand from the dunes to the east of the parking lot would be relocated to the west (in front) of the parking lot; this would allow for some dissipation of wave action prior to the sand lending structural support to the parking lot. As the parking lot erodes, the national seashore would move it eastward at a rate that would be likely to keep it at the edge of the floodplain (approximately every 10 years). Water would be displaced from the floodplain laterally in areas where the sand supporting the parking lot protrudes into the floodplain; however, the shape of that sand formation would allow for more energy dissipation and water infiltration than the asphalt revetment that currently exists.

As under alternative A, the beach parking lots would be closed during storms.

Cumulative Impacts

No other past, present, or reasonably foreseeable future actions have the potential to impact floodplains within the project area; therefore, there are no cumulative impacts on floodplains within the project area.

Conclusion

Overall, alternative B would result in continued adverse impacts on floodplains due to the maintenance of human-made structure and grading that impede the flow of water within the 100-year floodplain. Maintaining these structures would require that storm surge flow around the graded sand supporting the parking lot; however, this structure would retreat periodically to ensure that encroachment upon the 100-year floodplain was reduced. Following each periodic shift of the parking lot, the parking lot would not protrude into the floodplain; however, as coastal erosion progresses, it would become increasingly at risk for flooding and would impede the flow of floodwaters through the project area until the next periodic

shift eastward. Hazardous conditions associated with flooding would be present; however, the national seashore would not allow staff or the public into the project area if flooding was expected or present. The adverse impacts of alternative B on floodplains would not likely be significant because the dynamic coastal ecosystem would accommodate any altered flow of flood waters through other highly adaptable (and uninhabited) areas, although the natural floodplain within the project area would not be duplicated and other areas would not replace its natural functions. There would continue to be an extremely low risk to human safety associated with flooding events within the project area.

Alternative C: One-time Retreat (NPS Preferred)

Impacts

Under alternative C, the NPS would regrade the project area and replace the existing asphalt structures with a an asphalt parking lot of the same size, 125 feet eastward, and at a higher elevation (15 feet). As part of the grading of the project area, the existing dunes would be redistributed to support the new parking lot, to fill in the area formerly occupied by the existing parking lot, and to provide a small (approximately 3 feet high) sandy berm in place of the existing asphalt revetment. As under alternative B, the national seashore would relocate the vault toilet to a higher elevation along with the parking lot to minimize the chance of inundation; however, under this alternative, it would be a one-time move.

The 125-foot retreat from its current location in combination with its elevation to 15 feet would move this new parking lot well outside the limits of the floodplain. The regrading proposed under this alternative would be intended to restore the natural values of the floodplain following the removal of the existing revetment and parking lot. Flood events would reshape the beach and dunes naturally as wave energy was allowed to dissipate along the natural beach, and flood waters would be able to infiltrate into the sand naturally. The parking lot would remain within the area of 0.2% annual chance of flooding (the 500-year floodplain); however, it would be outside the area of 1% annual chance of flooding (the 100-year floodplain).

As under alternatives A and B, the beach parking lots would be closed during storms. Additional structures (e.g., a shade shelter and additional orientation signs) would also be maintained outside of the floodplain.

Cumulative Impacts

No other past, present, or reasonably foreseeable future actions have the potential to impact floodplains within the project area; therefore, there are no cumulative impacts on floodplains within the project area.

Conclusion

Overall, alternative C would result in beneficial impacts on floodplains due to the removal of human-made structures from the floodplain. Removal of these structures would allow the natural values of the 100-year floodplain to be restored. Hazardous conditions associated with flooding would be a concern only in the case of a 500-year flood event. The impacts of alternative C on floodplains would not likely be significant because the natural values of the floodplain would be restored (though the original values may not be duplicated) and because there would be little to no risk to human safety associated with flooding events within the project area.

PUBLIC USE AND EXPERIENCE

METHODOLOGY

Potential impacts on public use and experience are assessed based on the summary of current values, uses, and accommodations contained in chapter 3. NPS *Management Policies 2006* (NPS 2006a) states that enjoyment of national seashore resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for the public to enjoy parks. This section focuses on the ways in which visual resources, site access and circulation, and public safety combine to provide an experience and judges the outcome on its consistency with the Cape Cod National Seashore's purpose of preserving scenic, natural, and recreational values and providing opportunities for present and future generations to experience, enjoy, and understand these values and associated resources (NPS 1998).

Resource-specific context for assessing impacts of the alternatives on public use and experience includes the following:

- Visitors and local residents have had vehicular access to this beach since the 1930s.
- The Herring Cove North parking lot provides 208 spaces, all of which are filled by midday during the summer season.
- The Herring Cove Beach environment is relatively flat, providing easy access and expansive views from the parking lot to the beach.
- The Herring Cove North parking lot is heavily used by vehicles and bicyclists.

ALTERNATIVE A: NO-ACTION

Impacts

Under the no-action alternative, the Herring Cove North parking lot would continue to be a popular, year-round destination for both locals and tourists while it is in useable condition. The parking lot and revetment would remain in their current locations and at their current elevations. The 2.1 acre asphalt parking lot would continue to offer a maximum of 208 parking spaces, including four spaces for disabled permit holders and five spaces for long vehicles such as recreational vehicles, which may decrease over time if the lot sustains substantial damage. The national seashore would continue to repair damage to the parking lot and revetment as long as practical. Damaged areas would need to be temporarily closed pending repairs. Ultimately, some sections may be closed permanently. The NPS would make an effort to retain accommodations for both disabled and large vehicle parking spaces during any future closures. In addition to a reduction in capacity over time, the views of crumbling asphalt may detract from visitor enjoyment of the project area. Highly visible items such as flagging or traffic cones may be needed to warn visitors of parking lot closures, and this would detract from the generally natural surroundings of the parking lot.

The parking lot would remain immediately adjacent to the beach. Visitors would be able to continue to use the parking lot for unimpeded views of Cape Cod Bay. The parking lot would remain a favorite location for experiencing the beach from the comfort of a private vehicle during the winter.

Visitors would continue to have the opportunity to access the beach directly from the parking lot. As natural processes continue to expose the asphalt revetment, visitors would need to walk down the revetment to access the sandy beach which may make Herring Cove Beach inaccessible to some visitors. Severe storms could cause damage that would close the parking lot out of concern for visitor safety.

Bicyclists would continue to travel through the parking lot to connect between Moors Road and the Province Lands Bicycle Trail. The shared use of the area by bicyclists and vehicles could continue to affect visitors' sense of safety and increases the risk for accidents between users. Bicyclists enter the southern end of the parking lot through the same driveway as cars. Drivers who may be distracted (by wayfinding, by scenery, or by putting away their wallets after going through the fee booth, for instance) may not be watching for bicycles. As bicyclists follow the painted bicycle route along the eastern side of the parking lot, they are likely to encounter accumulated sand against the dunes. This sand is generally only cleared annually but can be a safety hazard, especially for inexperienced bicyclists. The bicycle route is designated within the same area meant for motorized vehicle travel. As such, bicyclists must be aware of vehicles entering or exiting the parking lot as well as those that may be backing out of parking spaces and unable to see bicycle traffic. The speed bumps meant to calm vehicle traffic are also in the bicycle lane, representing another possible hazard for inexperienced bicyclists or those trying to avoid a collision with a vehicle, a person, or another bicyclists.

The vault toilet facility would remain at the north end of the lot and would continue to provide restroom facilities convenient to users at the far north end of Herring Cove Beach.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have contributed and continue to contribute to the cumulative impact on the public use and experience in the vicinity of the project area. Such actions include the implementation of the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle accommodations, and Herring Cove Beach facilities development. These actions would improve the connectivity of the project area with other areas of the cape for bicyclists. The development of the Herring Cove Beach facilities would provide improved accommodations for visitors to Herring Cove Beach. All these improvements represent a beneficial impact on public use and experience in the vicinity of the project area. The impact of alternative A, in conjunction with the impacts of these other actions, would result in a beneficial impact on public use and experience. Alternative A would contribute noticeable beneficial and adverse increments to this cumulative impact.

Conclusion

Alternative A would result in both adverse and beneficial impacts on public use and experience. Adverse impacts on public use and experience could be expected from reduced capacity in the highly sought-after Herring Cove North parking lot. Revetment exposure caused by coastal processes would affect the ease of beach access from the parking lot, which may result in decreased access for visitors with limited mobility. In the event of a severe storm, the revetment, parking lot, or both could be damaged severely enough to cause closures (temporary or permanent) of the damaged area, affecting public use and experience for visitors who want to park in the parking lot. The shared use of the parking lot by bicyclists and vehicles would continue to cause safety concerns. Beneficial impacts on public use and experience would result from the ease of access provided by the parking lot. The abutment of the parking lot to the beach would

allow visitors with limited mobility to easily enjoy the beach, either by walking a few feet from their vehicles to the sandy beach (where the infrastructure remains intact enough to do so) or by viewing the beach from their vehicles as has been the practice for many decades. The convenience of the vault toilet would continue to make the beach abutting the parking lot a desirable location for beach-goers. Alternative A would contribute noticeable beneficial and adverse increments to the overall beneficial cumulative impact on public use and experience. These impacts would not likely be significant because visitors would retain vehicular access to the beach, as they have since the 1930s. The parking lot would remain available, albeit in a reduced capacity where closures are needed to protect public safety, and would continue to offer bicycle accommodations, easy access to the beach, and expansive views from the parking lot to the beach.

ALTERNATIVE B: PERIODIC RETREAT

Impacts

Under alternative B, the Herring Cove North parking lot would continue to be a popular, year-round destination for both locals and tourists. The existing parking lot and revetment would be removed and replaced with a 2.4 acre parking lot at 15 feet above sea level made of materials that can be moved or migrate inland as beach erosion continues. The slightly larger parking lot would offer approximately 200 parking spaces.

As natural coastal processes erode the beach, the parking lot would periodically (every ten years or as needed) retreat inland to remain usable. The initial reconstruction and the periodic retreats would require closures of the lot during construction periods which would be as minimal as possible. The initial removal of the existing parking lot and revetment and the construction of the new lot would require the lot to be closed in stages during winter months. The parking lot does not fill but does attract visitors during the winter months with its view of the bay. Construction could adversely impact public use and experience and deter visitors from using open parts of the parking lot during construction periods. Bicyclists would need to use Province Lands Road as an alternate route through the project area. Similarly, traffic on Province Lands Road could be disrupted while bicycle lanes are being installed, which could result in a temporary increase in congestion. Construction would be timed to avoid times of high visitor use to minimize these potential impacts.

Following construction, visitors would be able to walk a very short distance (up to approximately 25 feet) to the beach. Despite the 5-foot increase in elevation, beach access would continue to be easy due to grading of the project area. A low (a few feet high) sandy berm would be created west of the parking lot, but, the NPS would install boardwalks and/or mobi-mats to improve ease of access to the beach. The beach would remain easily accessed by those with limited mobility.

Visitors would be able to continue to use the parking lot for unimpeded views of Cape Cod Bay from the slightly set back and elevated location. The protective berm would be maintained at height that would not impede water views from the parking lot due to the popularity of this use.

To improve visitor comfort for users of Herring Cove Beach North, the vault toilet facility would remain at the north end of the lot (relocated in conjunction with the parking lot, if possible), and a modest shade and wind shelter (approximately 100 square feet) and informational boards would be installed nearby.

The vault toilet and shade shelter would provide convenient facilities for beachgoers at the northern portions of Herring Cove Beach. Users of the Province Lands Bicycle Trail would also be able to use this as a rest area, regardless of whether or not the beach was their final destination. The additional information sign would improve visitor orientation to local recreational opportunities.

Under this alternative, approximately 2,000 feet of Province Lands Road (the segment providing egress from the parking lot) would be widened to accommodate 5-foot wide bicycle lanes on both sides of the road. This would provide designated travel lanes exclusively for bicyclists travelling through the project area between Province Lands Bicycle Trail and Herring Cove Beach South/Moors Road/Provincetown. Bicyclists would be encouraged to use this route instead of travelling through the parking lot. Assuming that bicyclists use these lanes and practice good road-bicycling etiquette (such as riding single file), the potential for incidents between vehicles and bicycles would be greatly reduced.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have contributed and continue to contribute to the cumulative impact on the public use and experience within the project area. These projects are described under alternative A and include the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle accommodations, and Herring Cove Beach facilities development. All these improvements have a beneficial impact on public use and experience in the vicinity of the project area. The impact of alternative B, in conjunction with the impacts of these other actions, would result in a beneficial impact on public use and experience. Alternative B would contribute a noticeable beneficial increment to this cumulative impact.

Conclusion

Alternative B would result in both adverse and beneficial impacts on public use and experience. Recurring adverse impacts on public use and experience would result from closures due to construction; the public would be unable to use portions of the parking lot during this time, and visitors choosing to use the parking lot would be subject to adjacent to construction equipment and activities. Similarly, traffic on Province Lands Road could be disrupted while bicycle lanes are being installed, which may cause minor traffic congestion for visitors travelling through this area. Beneficial impacts on public use and experience would result from the continued ease of access to the beach provided by the new parking lot. The view of the bay from the parking lot would continue to be available year-round. The proximity of the parking lot to the beach and the addition of accessible boardwalks and/or mobi-mats would allow visitors with limited mobility to easily enjoy the beach, either by walking a few feet from their vehicles to the sandy beach or by viewing the beach from their vehicles as has been the practice for many decades. The convenience of a nearby toilet facility, shade and wind shelter, and informational boards would continue to make the beach abutting the parking lot a desirable location for beach-goers. The provision of bicycle lanes on Province Lands Road would provide a safer alternative to sharing the parking lot with vehicles. Alternative B would contribute a noticeable beneficial increment to the overall beneficial cumulative impact on public use and experience. These impacts would not likely be significant because visitors would retain vehicular access to the beach, as they have since the 1930s. The parking lot would remain available, albeit slightly removed from the beach, and would offer improved bicycle accommodations along Province Lands Road, easy access to the beach, and expansive views from the parking lot to the beach.

ALTERNATIVE C: ONE-TIME RETREAT (NPS PREFERRED)

Impacts

Under alternative C, the existing Herring Cove North parking lot and revetment would be removed and replaced with another lot farther inland. The replacement parking lot would be replaced with a 2.4 acre parking lot 125 feet inland at 15 feet above sea level. The slightly larger parking lot would offer approximately 200 parking spaces. The impacts on public use and experience would be similar to those described under alternative B with the following differences.

Construction of the new lot would occur before removal of the existing lot. This would eliminate any loss of parking capacity during construction of the new parking lot. Following construction, visitors would be able to walk a short distance to the beach. Access to the beach from the parking lot would not be as close as under alternatives A and B. Visitors would need to travel up to 125 feet to reach the beach. Visitors would traverse a similar berm to that described under alternative B. In early years post-construction, some visitors may find this walk to be an inconvenience that detracts from their enjoyment of their visit to the site; however, over time, visitors would come to expect this walk and appreciate the sustainable design; in the long term, their experience would no longer be diminished. The NPS would provide boardwalks and/or mobi-mats to maintain accessibility for visitors with limited mobility. Despite the 125-foot setback of the new parking lot from the existing location, unimpeded views of the water would be maintained over the low berm. The vault toilet, shade shelter, and informational boards mentioned under alternative B would also be included under this alternative.

Instead of installing bicycle lanes along Province Lands Road, a 10-foot bicycle route would be constructed adjacent to the eastern edge of the new parking lot. Unlike under alternative A, this route would be dedicated to bicycle and pedestrian traffic and would not be shared with vehicles. The path would be kept free of navigational hazards such as sand and speed bumps. The route would have sufficient space available that two-way traffic could be delineated to further reduce the potential for user conflicts within the project area.

In addition, under alternative C, approximately 450 feet of Province Lands Road would be realigned to accommodate the parking lot shift. The construction undertaken would be of a somewhat greater extent than under alternative B, but the impact would be similar; some congestion may take place, depending upon the level of visitation during construction.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have contributed and continue to contribute to the cumulative impact on the public use and experience within the project area. These projects are described under alternative A and include the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle accommodations, and Herring Cove Beach facilities development. All these improvements have a beneficial impact on public use and experience in the vicinity of the project area. The impact of alternative C, in conjunction with the impacts of these other actions, would result in a beneficial impact on public use and experience. Alternative C would contribute a noticeable beneficial increment to this cumulative impact.

Conclusion

Alternative C would result in both adverse and beneficial impacts on public use and experience. Temporary adverse impacts on public use and experience would result from construction/demolition activities taking place near the active parking lot; however, no reduction in parking capacity would be necessary. Beneficial impacts on public use and experience would result from the continued ease of access to the beach provided by the new parking lot; however, there may be adverse impacts on visitor experience as visitors adjust to the 125 foot walk to the beach in early years post-construction. The view of the bay from the parking lot would continue to be available year-round. The proximity of the parking lot to the beach and the addition of accessible boardwalks and/or mobi-mats would allow visitors with limited mobility to easily enjoy the beach, either by walking a few feet from their vehicles to the sandy beach or by viewing the beach from their vehicles as has been the practice for many decades. The convenience of a nearby toilet facility, shade and wind shelter, and informational boards would continue to make the beach abutting the North lot a desirable location for beach-goers. The provision of a dedicated bicycle route adjacent to the parking lot would provide a safer alternative to sharing the parking lot with vehicles. Alternative C would contribute a noticeable beneficial increment to the overall beneficial cumulative impact on public use and experience. These impacts would not likely be significant because visitors would retain vehicular access to the beach, as they have since the 1930s. The parking lot would remain available, albeit somewhat removed from the beach, and would offer improved bicycle accommodations adjacent to the new parking lot, easy access to the beach, and expansive views from the parking lot to the beach.

SOCIOECONOMIC RESOURCES AND ADJACENT LANDS

METHODOLOGY

Impact analyses are based on the current description of socioeconomic resources and adjacent lands presented in chapter 3. Cape Cod National Seashore is adjacent to several small, close-knit communities, and park actions can impact the socioeconomic resources and adjacent lands in such communities.

Many residents of Provincetown routinely use Herring Cove Beach facilities year-round. Because visitors to the project area (Herring Cove Beach North) may also choose to spend some time in nearby Provincetown (or other communities within Barnstable County), the area considered for this analysis expands beyond the Herring Cove Beach North parking lot to include Provincetown.

Resource-specific context for assessing impacts of the alternatives on operations and infrastructure includes:

- Tourism is an integral part of the local economies. Visitors to the national seashore spent more than $170 million in the local economies in 2010 (NPS 2010a).
- Cape Cod National Seashore draws over 4 million visits per year (NPS 2013); approximately 875,000 of these visitors go to Herring Cove Beach (NPS 2010a). It is usually the second beach parking lot to fill during the summer months in the national seashore (after the Nauset Light Beach parking area in Eastham) (Thatcher 2013).

ALTERNATIVE A: NO-ACTION

Impacts

Under alternative A, the Herring Cove Beach North parking lot would continue to be a popular, year-round destination for both locals and tourists while it is in useable condition. The parking lot and revetment would remain in their current locations and at their current elevations. As described under the "Public Use and Experience" section above, the parking lot would remain a popular year-round attraction due to its proximity to the beach and its expansive views of Cape Cod Bay. Emergency repairs of the parking lot and revetment would be undertaken when needed and practical. Future damage to the revetment and North lot could make Herring Cove Beach a less desirable beach area with progressively less capacity and with increasingly poor connectivity between Provincetown and the Province Lands Bicycle Trail for bicyclists. Bicyclists may be more likely to remain in town, taking advantage of in-town activities if bicycle paths become unusable, or they may find other routes to access attractions such as the Province Lands Bicycle Trail. Residents may be disappointed by the extent of facilities at Herring Cove Beach North that remain over time. However, some visitors may choose to visit other nearby areas such as Race Point Beach instead of Herring Cove Beach. The local population and economy would continue to benefit from use of and visits to Cape Cod's popular beaches, including Herring Cove Beach and Race Point Beach, despite the lack of improvements at Herring Cove Beach's North lot. Many of these visitors would continue to dine and/or stay overnight in Provincetown or other local communities. Bicycles can also be rented in Provincetown and ridden to the beaches. The need for emergency repairs to the asphalt revetment and parking lot would provide work for contractors. Work for local contractors would directly benefit the local economy, and out-of-town contractors would likely support local hotels, restaurants, stores, and other businesses.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on the socioeconomic resources and adjacent lands of the project area. Such actions include the implementation of the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle improvements, and Herring Cove Beach facilities development. Implementation of these actions would provide improved connections between the project area and other areas on the Cape, including local towns. The development of the Herring Cove beach facilities would provide additional accommodations for visitors to Herring Cove Beach, specifically those parking at or passing through the southern Herring Cove Beach parking lot. All these improvements provide a more tempting destination for tourists and locals, resulting in beneficial impacts on socioeconomic resources and adjacent lands. Alternative A would contribute an imperceptible beneficial increment to an overall beneficial cumulative impact.

Conclusion

Alternative A would result in continued beneficial impacts on socioeconomic resources and adjacent lands. Although visitation at Herring Cove Beach may decrease slightly as the capacity of the Herring Cove Beach North parking lot is reduced, overall visitation to this area is likely to remain relatively high. Visitors to the park would continue to eat and stay overnight in local communities such as Provincetown. The repairs needed to keep the revetment and parking lot intact as long as possible would provide recurring but short-term work for paving companies, a beneficial impact to the local economy. Alternative

A would contribute an imperceptible beneficial increment to the overall beneficial cumulative impact on socioeconomic resources and adjacent lands. These impacts would not likely be significant because although Herring Cove Beach is one of the most popular beaches in the national seashore and may suffer reduced visitation under this alternative, the national seashore would continue to contribute heavily to the local economies.

ALTERNATIVE B: PERIODIC RETREAT

Impacts

Under alternative B, the Herring Cove Beach North parking lot would continue to be a popular, year-round destination for both locals and tourists in Provincetown. Tourists and seasonal residents would continue to flock to Herring Cove Beach and are likely to visit Provincetown. The existing parking lot and revetment would be removed. The parking lot would be replaced with a 2.4 acre parking lot in the same location as the existing parking lot but at 15 feet above sea level. The replacement lot would support approximately 200 vehicles, similar to the existing capacity, and visitation would likely follow current trends. This parking lot would be moved back approximately 10 feet every 25 years or as needed to avoid coastal erosion. As the only lot with such an expansive view of the bay, the Herring Cove North parking lot would continue to attract visitors, particularly those with limited mobility, year-round. Province Lands Road would be widened to accommodate 5-foot wide bicycle lanes on both sides of the road for approximately 2,000 feet within the project area.

The local population and economy would continue to benefit from Herring Cove Beach's continued popularity. Many of these visitors would choose to dine in and/or stay overnight in Provincetown or other local communities. Bicycles can also be rented in Provincetown and ridden to the beaches. The addition of bicycle lanes along Province Lands Road may result in a slight increase in bicycle rentals due to the improved accommodations. The need for periodic shifting of the paving materials would provide work for contractors.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on the socioeconomic resources and adjacent lands within the project area. These projects are described under Alternative A and include the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle improvements, and Herring Cove Beach facilities development. All these improvements provide a more tempting destination for tourists and locals, resulting in beneficial impacts on socioeconomic resources and adjacent lands. Alternative B would contribute an imperceptible beneficial increment to an overall beneficial cumulative impact.

Conclusion

Alternative B would result in continued beneficial impacts on socioeconomic resources and adjacent lands. The new parking lot would be constructed in a way that would continue to provide immediate access to the beach but in a way that could retreat with the natural erosion of the coast, and new bicycle lanes would provide more attractive bicycle accommodations through the project area, which may cause a slight increase in bicycle rentals in Provincetown. Visitors to the park would continue to eat and stay

overnight in local communities such as Provincetown. The periodic retreat of the parking lot would provide recurring but short-term work for paving companies, a beneficial impact to the local economy. Alternative B would contribute an imperceptible beneficial increment to the overall beneficial cumulative impact on socioeconomic resources and adjacent lands. These impacts would not likely be significant because Herring Cove Beach would continue to draw visitors at a rate that makes it one of the most popular beaches in the park; the park would continue to contribute heavily to the local economies.

ALTERNATIVE C: ONE-TIME RETREAT (NPS PREFERRED)

Impacts

Under alternative C, the Herring Cove Beach North parking lot would continue to be a popular, year-round destination for both locals and tourists in Provincetown. Tourists and seasonal residents would continue to flock to Herring Cove Beach and are likely to visit Provincetown. The existing parking lot and revetment would be removed. The parking lot would be replaced with a 2.4 acre parking lot 125 feet east of the existing parking lot and at an elevation of 15 feet above sea level. The replacement lot would support approximately 200 vehicles, similar to the existing capacity, and visitation would likely follow current trends. A separate 10-foot bike route would be constructed adjacent to the eastern edge of the parking lot.

Impacts under this alternative would be the same as described under alternative B. The only difference is that paving would only be needed once; therefore, the contribution to the local economy from providing employment for contractors would be less under this alternative than under alternative B.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on the socioeconomic resources and adjacent lands within the project area. These projects are described under Alternative A and include the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle improvements, and Herring Cove Beach facilities development. All these improvements provide a more tempting destination for tourists and locals, resulting in beneficial impacts on socioeconomic resources and adjacent lands. Alternative C would contribute an imperceptible beneficial increment to an overall beneficial cumulative impact.

Conclusion

Alternative C would result in continued beneficial impacts on socioeconomic resources and adjacent lands. The new parking lot would be constructed in a way that would continue to provide immediate access to the beach but in a way that would be removed from the natural erosion of the coast, and new bicycle lanes would provide more attractive bicycle accommodations through the project area, which may cause a slight increase in bicycle rentals in Provincetown. Visitors to the park would continue to eat and stay overnight in local communities such as Provincetown. The construction of the new parking lot would provide work for paving companies, a beneficial impact to the local economy. Alternative C would contribute an imperceptible beneficial increment to the overall beneficial cumulative impact on socioeconomic resources and adjacent lands. These impacts would not likely be significant because Herring Cove Beach would continue to draw visitors at a rate that makes it one of the most popular beaches in the park; the park would continue to contribute heavily to the local economies.

OPERATIONS AND INFRASTRUCTURE

METHODOLOGY

Impact analyses are based on the current description of park operations and park facilities presented in chapter 3. Park operations and park facilities includes quality of effectiveness of the infrastructure and the ability to maintain the infrastructure used in the operation of the national seashore in order to adequately protect and preserve vital resources and provide for an effective and safe employee and visitor experience.

Because use of the project area (Herring Cove Beach North) is closely tied to the adjacent Herring Cove facilities and to adjacent bicycle-related infrastructure, the area considered for this analysis expands beyond the Herring Cove North parking lot to include cumulative impacts within the wider Herring Cove area.

Resource-specific context for assessing impacts of the alternatives on operations and infrastructure includes:

- Parks must operate within the constraints of the unit-specific budget and number of staff positions that have been allocated by Congress and the NPS Director's office.
- Park staff is not only responsible for activities within the project area but must also provide for an effective and safe experience and protect resources within the entire park.
- The national seashore's enabling legislation states that "the seashore shall be permanently preserved in its present state," which is interpreted by the NPS as generally limiting development to the level that existed at the time of the legislation's enactment. Preservation would include a mixture of resources and activities that could change but must remain comparable in character and scale to that in existence in 1961 (NPS 1998).

ALTERNATIVE A: NO-ACTION

Impacts

Under alternative A, the Herring Cove North parking lot and revetment would remain in their current locations and at their current elevations. The 2.1 acre asphalt parking lot would continue to offer a maximum of 208 west-facing parking spaces which may decrease over time as the integrity of the parking lot is jeopardized by storm events. Flooding and wave action during storm events would continue to cause direct damage to the infrastructure, and the national seashore would need to invest time to assess the damage and arrange for repairs, if appropriate. Overwash events also deposit sand on the parking lot that requires removal outside of the regular schedule. Severe storms could cause damage that would close portions of the parking lot (either temporarily or permanently) out of concern for visitor safety. Closures have the potential to decrease revenue when visitors would be turned away because of insufficient parking.

Outside of increasing repair needs, the operations within the project area would remain unchanged (other related activities that affect operations and infrastructure in the wider Herring Cove Beach area are discussed under the "Cumulative Impacts" section below. The lot is heavily used as demonstrated by the fact that it consistently fills to capacity by midday in the summer months. Windblown sand is removed each spring after the winter storms blow sand into the parking lot. There is a substantial accumulation

some years. The Maintenance Division of the national seashore disperses the sand annually with heavy equipment to the beach and dunes.

The vault toilet would remain in its current location until flood damage became a greater concern and funding became available for its relocation. Bicyclists would share the existing infrastructure with motor vehicles. The bicycle route between Herring Cove Beach South and the Province Lands Bicycle Trail would continue to travel through the Herring Cove North parking lot.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have contributed and continue to contribute to the cumulative impact on the operations and infrastructure of the project area. Such actions include the implementation of the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle accommodations, and Herring Cove Beach facilities development. Implementation of these actions has provided or will provide additional infrastructure to improve connections between the project area and other areas within the national seashore and the Cape in general. The development of the Herring Cove Beach facilities provides updated accommodations for visitors to Herring Cove Beach but requires NPS oversight of daily operations and ongoing maintenance. All these improvements provide more efficient infrastructure for visitors but also place additional demands on park operations resulting in both beneficial and adverse impacts on operations and infrastructure. Alternative A would contribute a noticeable adverse increment to an overall beneficial cumulative impact.

Conclusion

Alternative A would result in adverse impacts on operations and infrastructure. Adverse impacts on operations and infrastructure could be expected from damage to existing infrastructure which would then require time and materials to make repairs as long as safe and practical. In the event of a severe storm, the revetment and/or parking lot could be damaged severely enough to cause closures of the damaged area, affecting operations and infrastructure until funding is available for repair. Alternative A would contribute a noticeable adverse increment to the overall beneficial cumulative impact on operations and infrastructure. These impacts would not likely be significant because maintenance of the infrastructure within the project area would distract park staff from other responsibilities within the national seashore, but maintaining this parking lot in its current location represents the character and scale of the infrastructure that has existed within the project area since 1961.

ALTERNATIVE B: PERIODIC RETREAT

Impacts

Under alternative B, the existing Herring Cove North parking lot and revetment would be removed. The parking lot would be replaced with a 2.4 acre parking lot at 15 feet above sea level made of materials that can migrate inland as beach erosion continues. The replacement lot would provide approximately 200 west-facing parking spaces. As natural coastal processes erode the beach, the parking lot would periodically (every 10 years or as needed) retreat 25 feet inland to remain in good condition. Moving the primary dune to the east of the parking lot would reduce the amount of sand that accumulates in the parking lot, which would reduce the effort by park maintenance to keep the parking lot clear when

compared to current needs. Damage to the parking lot would be greatly reduced by raising it out of the floodplain; however, regularly shifting the parking lot back would require a noteworthy amount of time and resources at regular intervals. The initial reconstruction and the periodic retreats would require closures of the lot during construction periods, although these closures would be kept as brief as possible.

Several additional elements of infrastructure within the project area would be modified or added under this alternative. The vault toilet would also be relocated to avoid inundation and keep it readily accessible to visitors. The NPS would install boardwalks and/or mobi-mats to improve accessibility from the parking lot to the beach. Mobi-mats would be removed annually so they do not get buried by sand. A modest shade and wind shelter (approximately 100 square feet) and informational boards would be installed nearby. In some cases, items such as the vault toilet and mobi-mats may have to be moved more than once in conjunction with periodic parking lot retreats.

The Province Lands Bicycle Trail would connect Moors Road to the Herring Cove Beach South parking lot by way of Province Lands Road, which would be widened to accommodate approximately 2,000 feet of 5-foot wide bicycle lanes on both sides of the road. These modifications and additions would provide for safer and more enjoyable visitor experiences but would require time and resources for initial construction. Construction would require some alteration in traffic patterns that would temporarily decrease the efficiency of Province Lands Road as a transportation route through the project area.

The preliminary conceptual level costs required for this alternative are estimated to be $4.5 million initially, with an additional $5.75 million needed over the next 25 years for the periodic shifts and maintenance.

Recurring short-term adverse impacts on operations and infrastructure would be expected from closures due to construction and the time and resources required to demolish the existing parking lot, construct the new parking lot, and implement periodic retreats of the parking lot. Traffic flow on Province Lands Road would be altered while bicycle lanes are being installed, which could adversely impact the effective flow of traffic through the project area. The addition of boardwalks and/or mobi-mats would make the beach more accessible from the parking lot but would require additional upkeep as the materials and structures sustain damage or require movement concurrent with a retreat of the parking lot. The new shade and wind shelter and informational boards would also require routine maintenance and repairs. Beneficial impacts on operations and infrastructure would result from easier routine maintenance of the new Herring Cove North parking lot. The periodic retreats of parking lot would reduce the need for emergency repairs to storm damage.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have contributed and continue to contribute to the cumulative impact on the public use and experience within the project area. These projects are described under Alternative A and include the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle accommodations, and Herring Cove Beach facilities development. All these improvements provide more efficient infrastructure for visitors but also place additional demands on park operations resulting in both beneficial and adverse impacts on operations and infrastructure. Alternative B would contribute both beneficial and adverse increments to an overall beneficial and adverse cumulative impact.

Conclusion

Alternative B would result in both adverse and beneficial impacts on operations and infrastructure. Recurring construction activities would temporarily inhibit the ability of park staff to provide an effective and safe experience and protect resources within the project area. Furthermore, the capital required to construct, demolish, and reconstruct, and maintain the infrastructure associated with this alternative may detract from the ability of park staff to improve and/or maintain other resources throughout the entire park. Similarly, the park would need to acquire $4.5 million for construction and would need to incorporate the $5.75 million for the periodic parking lot shifts into the unit-specific budget. Availability of funding on a repetitive basis is uncertain. When the impacts on operations and infrastructure as a result of alternative B are combined with other projects in the project area, both beneficial and adverse cumulative impacts would be expected. Alternative B would contribute noticeable beneficial and adverse increments to the overall beneficial and adverse cumulative impacts. These impacts would not likely be significant because implementing periodic retreats of the parking lot would distract national seashore staff from other responsibilities within the national seashore, but maintaining a parking lot in this location, despite its placement in a dynamic coastal environment, represents the character and scale of the infrastructure that has existed within the project area since 1961.

ALTERNATIVE C: ONE-TIME RETREAT (NPS PREFERRED)

Impacts

Under alternative C, the existing Herring Cove North parking lot and revetment would be removed. The parking lot would be and replaced with a 2.4 acre parking lot 125 feet inland at 15 feet above sea level. The replacement lot would support approximately 200 vehicles, similar to the existing capacity. Demolition and construction activities would require a one-time effort to alter the existing configuration, including realignment of approximately 450 feet of Province Lands Road. Construction of the new lot would occur before removal of the existing lot in order to avoid closures. Moving the primary dune to the east of the parking lot would reduce the amount of sand that accumulates in the parking lot, which would reduce the effort by national seashore maintenance to keep the parking lot clear when compared to current needs. Storm damage to the parking lot would not be a concern in the higher, inland location.

As under alternative B, several additional elements of infrastructure within the project area would be modified or added under this alternative and would require regular maintenance. Boardwalks and/or mobi-mats would be added to facilitate access from the parking lot to the beach, although these connections would be up to 125 feet long under this alternative. The other amenities (the vault toilet, the shade shelter, and the informational boards) would have the same impacts as described under alternative B except these facilities would not need to be moved following initial construction/relocation. A 10-foot wide bicycle lane would be added to the eastern side of the parking lot with impacts related to construction and improved transportation through the project area which are similar to those under alternative B.

The preliminary conceptual level costs for this alternative are estimated to be approximately $4.5 million initially, with an additional $825 thousand needed for maintenance over the next 25 years.

One-time short-term adverse impacts on operations would be expected due to the time and resources required to demolish the existing parking lot and to construct the new parking lot and bicycle route. Additionally, under this alternative, realignment of approximately 450 feet of Province Lands Road would require additional time and funding. The impacts related to the vault toilet, shade shelter, and informational signs would be the same as under alternative B except only one relocation/construction necessary.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have contributed and continue to contribute to the cumulative impact on the public use and experience within the project area. These projects are described under Alternative A and include the *Cape Cod National Seashore Integrated Bicycle Feasibility Study*, the Province Lands Bicycle Trail renovations, the rehabilitation of Moors Road with bicycle accommodations, and Herring Cove Beach facilities development. All these improvements provide more efficient infrastructure for visitors but also place additional demands on national seashore operations resulting in both beneficial and adverse impacts on operations and infrastructure. Alternative C would contribute both beneficial and adverse increments to an overall beneficial and adverse cumulative impact.

Conclusion

Alternative C would result in both adverse and beneficial impacts on operations and infrastructure. One-time construction activities would temporarily inhibit the ability of park staff to provide an effective and safe experience and protect resources within the project area. Furthermore, the capital required to construct and maintain the infrastructure associated with this alternative may detract from the ability of park staff to improve and/or maintain other resources throughout the entire park. Similarly, the park would need to acquire $4.5 million for construction and would need to incorporate the $850 thousand for maintenance over the next 25 years into the unit-specific budget. Availability of funding on a repetitive basis is uncertain. It should be noted that the burden on park staff and budget would be considerably less than alternative B under this alternative because alternative B requires a heavy obligation of time and money during each periodic (approximately each 5 years) parking lot shift; this alternatives requires a one-time reconstruction with regular maintenance. When the impacts on operations and infrastructure as a result of alternative C are combined with other projects in the project area, both beneficial and adverse cumulative impacts would be expected. Alternative C would contribute noticeable beneficial and adverse increments to the overall beneficial and adverse cumulative impacts. These impacts would not likely be significant because following initial construction, the location of the new parking lot would require considerably less maintenance that under existing conditions; therefore, maintenance of this parking lot would be less of a distraction from other operational/maintenance needs within the national seashore, and it would maintain a parking lot representing the approximate character and the same scale of the infrastructure that has existed within the project area since 1961.

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CONSULTATION AND COORDINATION

This "Consultation and Coordination" chapter describes the public involvement and agency consultation used during the preparation of the EIS. A combination of activities, including public scoping, formal public meetings, internal workshops, and agency briefings, has helped to guide the NPS in developing this EIS. This chapter provides a detailed list of the various consultations initiated during the development of the EIS, as well as a list of preparers and the list of recipients for this document.

BRIEF HISTORY OF PLANNING AND PUBLIC INVOLVEMENT

NPS DO-12 requires the NPS to make "diligent" efforts to involve the interested and affected public in the NEPA process. This process, known as scoping, is initiated at the beginning of a NEPA project to identify the range of issues, resources, and alternatives to address in the EA. Typically, both internal and public scoping is conducted to address these elements. Commonwealth and federal agencies were also contacted in order to uncover any additional planning issues and to fulfill statutory requirements. The planning process for the proposed action was initiated during the internal, agency, and public scoping in the fall of 2012. This process introduced the purpose and need of the project and potential parking lot configurations that could meet the objectives of the project. Discussions with interested agencies and individuals were initiated at this time.

Cape Cod National Seashore's GMP directs the national seashore to conduct planning in a cooperative way with the local towns. The proposed action has the potential to affect the experience that visitors to and residents of Provincetown have as they seek recreation at Herring Cove Beach or the Province Lands Bicycle Trail; therefore, the NPS took steps to include both the local public and official representatives of Provincetown during scoping.

INTERNAL SCOPING

Internal scoping for the proposed action was initiated as part of the NEPA process. The Herring Cove Beach Subcommittee held regular meetings and worked with the national seashore and other partners to

develop alternatives which would fulfill the objectives of the project while considering public input. A preferred alternative was identified by the Subcommittee and recommended to the Advisory Commission. Subcommittee membership included three representatives of the Advisory Commission (including the representatives of Provincetown and of the Commonwealth), an additional representative of the Town of Provincetown, a representative from the Massachusetts Office of Coastal Zone Management, and the Regional Chief Scientist of the NPS; these individuals are listed below under "Contributors and Reviewers." The Subcommittee was served by a team of technical advisors, including coastal geologists, an engineer, a facilitation team, as well as by liaisons from the national seashore. The Subcommittee's task was to develop a set of alternative design scenarios for the Herring Cove Beach revetment and parking area for submission to the Advisory Commission.

PUBLIC SCOPING

On October 30, 2012, at the Center for Coastal Studies in Provincetown, MA, the seashore, and the Advisory Commission co-sponsored a public scoping meeting to launch Public Scoping for the Herring Cove Revetment and Parking Environmental Assessment. The public was invited to submit comments on the scope of the planning process, issues, concerns and potential alternatives through November 30, 2012. During the scoping period, 15 pieces of correspondence were entered into the NPS Planning, Environment, and Public Comment (PEPC) system either from direct entry by the commenter, summary entry by CBI based on comments at the Public Scoping Meeting, or by uploading hard copy letters received by the NPS. The primary concerns articulated during this scoping period were convenient beach access; beach accessibility for the elderly, young, and disabled; and the retention of the views of the beach, sunsets, and ocean from the lot. Other common concerns included the protection of the beach from natural shoreline erosion; NPS policies, regulations, and laws inhibiting the communities' desired beach management activities; the protection of the valued range of activities at Herring Cove Beach; and compromised experiences of the natural world. Most commenters were concerned about historical uses, cultural resources, and/or accessibility. Similar sentiments were expressed by a couple additional emails sent to the park during August 2013.

AGENCY, TRIBAL, AND ORGANIZATION CONSULTATION

Agencies contacted via letter during the planning process included the USFWS, the Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program (NHESP), and the SHPO. The agency consultation is discussed by statutory category below.

FEDERAL AGENCIES

Section 7 of the Endangered Species Act

The national seashore sent a letter to the USFWS on June 12, 2013, notifying the agency of the commencement the compliance process and initiating informal consultation on the 1973 Endangered Species Act. The letter sent out by the national seashore is included in "Appendix A: Relevant Correspondence." There are two known federally listed species [the piping plover (*Charadrius melodus*)

and the roseate tern (*Sterna dougallii*)] that may potentially occur near the project area; however, for the reasons discussed in chapter 1, the NPS believes that the proposed action is not likely to adversely affect these federally listed species. The national seashore will provide USFWS with a copy of this document and will continue to coordinate with the agency as the project moves forward, as needed.

Section 106 of the National Historic Preservation Act

The national seashore sent letters to the ACHP and the SHPO on June 17, 2013. The letters sent out by the national seashore are included in "Appendix A: Relevant Correspondence." The Section 106 process for actions associated with this plan is being conducted separately from the NEPA process and is anticipated to take the form of an assessment of effect form/letter. Because the project area is in a constantly shifting coastal environment, the probability of encountering previously unrecorded cultural resources is very small, and the NPS anticipates concurrence from the SHPO on a finding of no historic properties affected.

Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Appropriation Act

The U.S. Army Corps of Engineers (USACE) has jurisdiction over all waters of the U.S. within the boundaries of and off the coast of Massachusetts. USACE jurisdiction begins at the high tide line along the shoreline of the Herring Cove Beach. The high tide line is typically identified as the normal spring tide elevation. Work seaward of the high tide line at the Herring Cove Beach would require USACE review and approval pursuant to section 10 of the Rivers and Harbors Appropriation Act of 1899.

In 2010, the New England District of the USACE issued a state-wide General Permit for a variety of activities allowed within waters of the U.S. that the New England District has determined would have minimal individual and cumulative adverse effects on the aquatic environment. Landowners are required to submit information to the New England District office prior to initiating maintenance construction activities in order for the New England District to determine if the project qualifies for the General Permit. The NPS expects the proposed action to meet the eligibility criteria for a Category 1 General Permit to achieve compliance with section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Appropriation Act, and plans to submit a notification accordingly. The eligibility criteria are outlined in appendix B of this EA. The New England District office searched but did not find a permit that may have been issued to the Massachusetts Department of Public Works when the state owned the lands, prior to the 1965 repair work by the NPS.

AMERICAN INDIAN TRIBES

The national seashore sent letters to the Tribal Historic Preservation Officer of the Wampanoag of Gay Head – Aquinnah and the Tribal Historic Preservation Officer of the Mashpee Wampanoag Tribe on June 17, 2013. The letters sent out by the national seashore are included in "Appendix A: Relevant Correspondence." The national seashore will provide the tribes with a copy of this document and will continue to coordinate with them as the project moves forward.

STATE AND LOCAL AGENCIES

Massachusetts Division of Fisheries and Wildlife

The national seashore coordinated with the NHESP on state-listed special status species. The response from NHESP was dated July 1, 2013. Their records indicate that seven species of state special concern may be found within the vicinity of the project area: the eastern box turtle (*Terrapene carolina*), the eastern spadefoot toad (*Scaphiopus holbrookii*), the piping plover (*Charadrius melodus*), the common tern (*Sterna hirundo*), the roseate tern (*Sterna dougallii*), the arctic tern (*Sterna paradisaea*), and the least tern (*Sternula antillarum*). The roseate tern is a state-listed endangered species, the eastern spadefoot toad and piping plover are state-listed threatened species, and the other four are state-listed special concern species. This response is included in "Appendix A: Relevant Correspondence."

Massachusetts Office of Coastal Zone Management

The Coastal Zone Management Act (16 USC Section 1456) also requires that federal agency activities that have reasonably foreseeable effects on the coastal zone be consistent with enforceable state coastal management policies to the greatest extent practical. These policies recognize the ecological significance of coastal waters and strive to protect both the water quality and the integrity of significant resource areas. Because all of Cape Cod is within the coastal zone and this plan evaluates alternatives which include the design, construction, and disposal of NPS facilities, the national seashore has provided a Federal Consistency Determination for the proposed action is contained in appendix B of this EA.

Massachusetts Department of Environmental Protection

Dredge and/or fill projects in waters and wetlands subject to state and federal jurisdiction if a federal permit is required for the project. It applies to any activity that would result in a discharge of dredged material, dredging, or dredged material disposal greater than 100 cubic yards that is also subject to federal regulation must obtain a 401 Water Quality Certification. The Division of Wetlands and Waterways in the Department of Environmental Protection administers the 401 Water Quality Certification Program. As the authority to administer the 401 Water Quality Certification is derived from the Federal Water Pollution Control Act, only projects that require a federal permit are subject to 401 review. There is no discharge of dredge or fill materials into wetlands under this project, therefore there is no need to file for Water Quality Certification.

ORGANIZATIONS AND INDIVIDUALS

The planning team has continued to communicate with Provincetown officials throughout the development of this document and has invited Provincetown officials to meet with them during benchmark planning stages. This included including the Assistant Town Manager and a community representative in the Subcommittee and briefings to the Board of Selectmen.

Provincetown Conservation Commission

The MWPA applies to any construction in or near a wetland resource, including intertidal and subtidal habitat. Chapter 131 of the MWPA is far broader in scope than discharge control. The interests protected through this law include other interests beyond pollutants discharge. The national seashore would file relevant MWPA paperwork with the Provincetown Conservation Commission.

LIST OF PREPARERS AND CONTRIBUTORS

This document was prepared by Vanasse Hangen Brustlin, Inc., with contributions by Cape Cod National Seashore, the seashore's Advisory Commission's Herring Cove Beach Subcommittee, and the NPS Northeast Region Office.

PREPARERS

Vanasse Hangen Brustlin, Inc.		
Tricia Wingard	NPS Program Manager	Guidance of the NEPA process; document review
Tracy Hamm	Project Manager	Document preparation; natural resources review and analysis; and project management
Mariah Murphy	Environmental Planner	Document preparation
Chris Frye	Coastal Environmental Scientist	Natural resources review and analysis
Margaret Beavers	GIS Analyst/Graphics Specialist	Graphics and Geographic Information System analysis

CONTRIBUTORS AND REVIEWERS

Cape Cod National Seashore	
George Price	Superintendent
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Bill Burke	Cultural Resource Specialist
Mark Adams	GIS Specialist
Craig Thatcher	North District Ranger
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John DeFoe	Roads, Trails and Grounds Supervisor
Russ Hughes	Law Enforcement Ranger
Chris Hartsgrove	Law Enforcement Ranger
Stephen Smith	Plant Ecologist

Cape Cod National Seashore Advisory Commission Herring Cove Beach Subcommittee	
Mary-Jo Avellar	Provincetown Community Representative
Rich Delany	Chair
Mary Foley	Regional Chief Scientist, NPS
Dave Gardner	Assistant Town Manager, Town of Provincetown
Steve McKenna	Cape Cod & Islands Regional Coordinator, Massachusetts Office of Coastal Zone Management
Mark Robinson	Representative of Governor's Office
Technical Team Members of Subcommittee	
Graham Giese	Provincetown Center for Coastal Studies
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Dave Porter	Childs Engineering Corporation
Stacie Smith	Consensus Building Institute
Eric Roberts	Consensus Building Institute

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Jacki Katzmire	Regional Environmental Coordinator
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Sarah Killinger	Resource Planning Specialist
Amanda Babson	Coastal Climate Adaptation Coordinator

PUBLIC REVIEW

The EA will be on formal public and agency review for 45 days and has been distributed to a variety of interested individuals, agencies, and organizations. It also is available on the internet at <www.parkplanning.nps.gov/caco>, and hard copies are available at the national seashore's Marconi headquarters.

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Vanasse Hangen Brustlin, Inc (VHB)

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APPENDIX A: RELEVANT CORRESPONDENCE

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United States Department of the Interior

NATIONAL PARK SERVICE
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, Massachusetts 02667
508.771.2144
508.349.9257 Fax

IN REPLY REFER TO:
L7617

June 12, 2013

Thomas R. Chapman
US Fish and Wildlife Service
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

Re: Herring Cove Beach North Public Access Site Plan

Dear Mr. Chapman:

Under the terms of the National Environmental Policy Act (NEPA), the National Park Service (NPS) at Cape Cod National Seashore (the park) is preparing environmental compliance analysis and documentation. Cape Cod National Seashore is taking action to develop a long-term plan for the Herring Cove Beach North public access in consultation with the Provincetown community. The plan/Environmental Assessment (EA) will identify and incorporate the values and importance that visitors to the national seashore and local residents place on Herring Cove Beach. The preferred alternative will be based upon sound coastal science and engineering practices, and will be responsive to shoreline change, projected sea level rise, and community and visitor recreational use.

Herring Cove Beach is of special concern to the residents and visitors of Provincetown, Massachusetts because it is the only remaining Provincetown beach with direct ocean view parking and car-to-sand access for people of all ages and abilities. It is one of six life-guarded beaches managed by Cape Cod National Seashore (the Seashore). The Commonwealth of Massachusetts developed the Herring Cove Beach facilities in the 1950's and includes: a one-mile macadam revetment (seawall); two parking lots; and, a bath house and concession stand (which are currently being replaced.) Wave action in late December 2011 caused damage to the asphalt revetment near the bath house and sections of the north parking lot, and coastal areas near the south parking lot. This is not the first time damage to the revetment and parking lot have occurred, and projected sea level rise and climate-related weather patterns threaten the future of these facilities. Last year's storm damage provided the impetus to develop a long-term solution to maintain or enhance the shoreline's environmental integrity and safe beach access.

Appropriate Best Management Practices (BMPs) will be built into the design to avoid or limit impacts to resources. In addition to other BMPS, all ground disturbances will occur between September 1 and April 14 to minimize impacts to reptiles, amphibians, and birds. On Friday, May 17, 2013, Dr. Stephen Smith, CCNS Plant Ecologist, performed a botanical survey of the Herring Cove North area and found no state-listed rare plant species amongst the shrub land species between the parking lot and Province Lands Road, and some lichens and mosses amongst the heathland species to the east of the road.

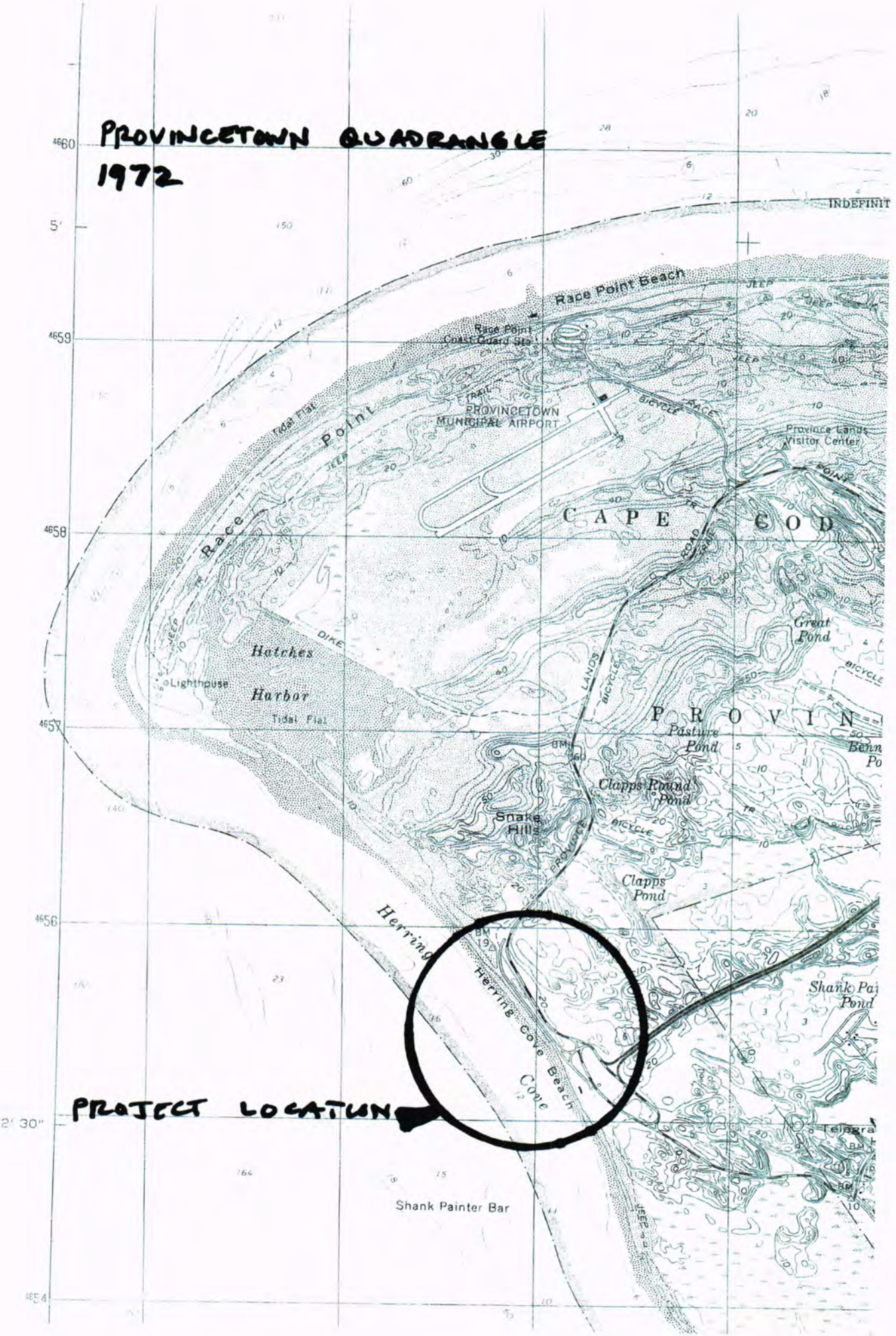
This letter serves as notification that we have begun the compliance process as part of the environmental assessment effort. This letter also serves as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the 1973 Endangered Species Act, as amended, and NPS Management Policies 2006. As part of the scoping for this project, we request any information regarding listed or proposed threatened or endangered species or critical habitats that might occur in the project vicinity, and any special management considerations for such species. The project area is depicted on the enclosed section of the USGS Quadrangle and site conceptual design drawing.

We appreciate your input on this project. If you have any questions regarding the project, please contact Jason Taylor, Chief of Natural Resources Management, at jason_j_taylor@nps.gov or (508) 957-0737.

Sincerely,

George E. Price, Jr.
Superintendent

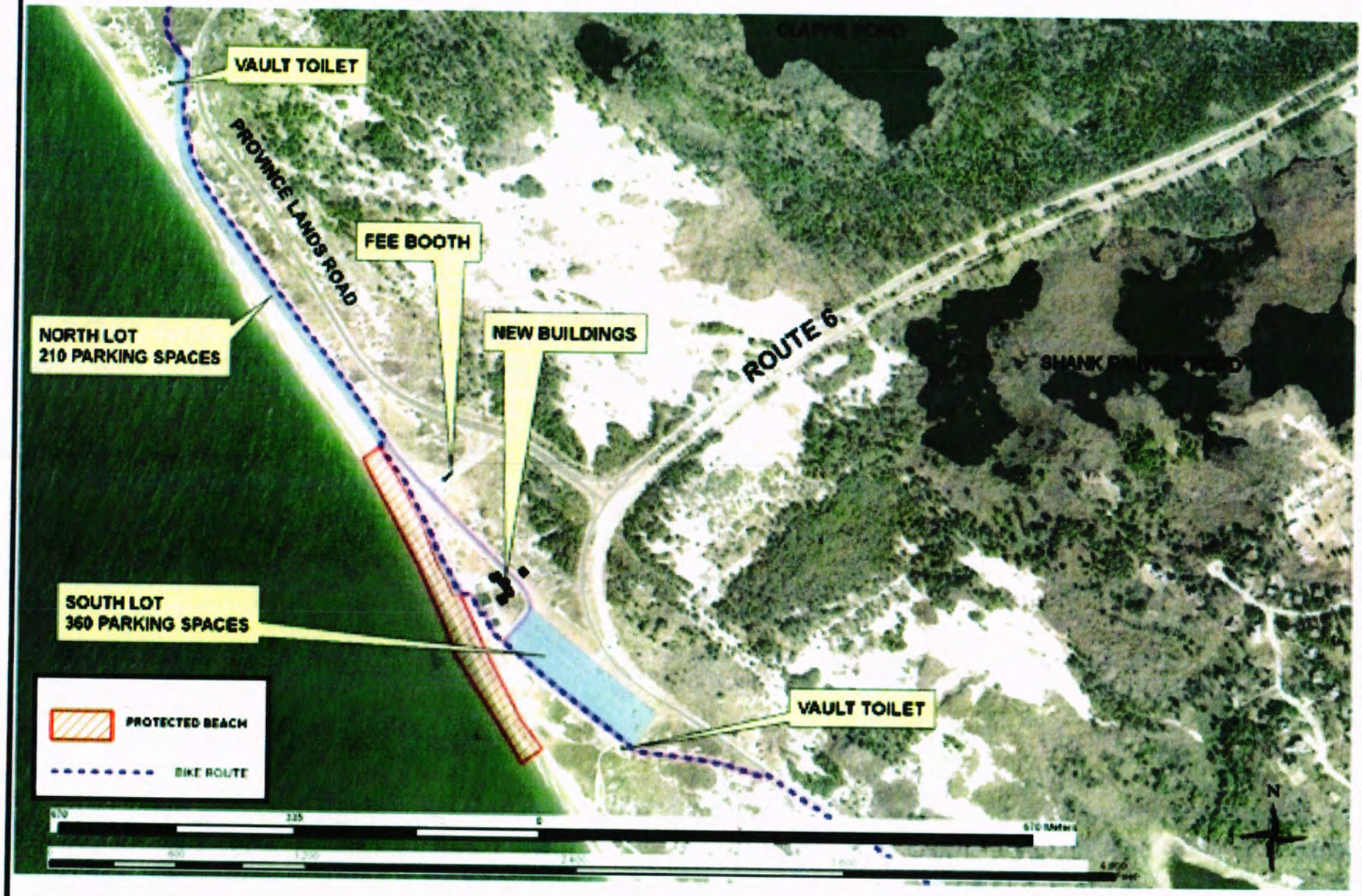
Attachments


PROVINCETOWN QUADRANGLE
1972
Race Point Beach
Race Point Coast Guard Sta.
PROVINCETOWN MUNICIPAL AIRPORT
Province Lands Visitor Center
Race Point
Tidal Flat
CAPE COD
Hatches Harbor
Lighthouse
Tidal Flat
Great Pond
Pasture Pond
Clapps Pond
Snake Hills
Herring Cove
Herring Cove Beach
Shank Painter Pond
Shank Painter Bar
PROJECT LOCATION
INDEFINIT

Cape Cod National Seashore
Massachusetts

National Park Service
U.S. Department of the Interior

HERRING COVE -- EXISTING CONDITIONS



United States Department of the Interior

NATIONAL PARK SERVICE
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, Massachusetts 02667
508.771.2144
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IN REPLY REFER TO:

L7617
X H4217

June 17, 2013

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, Massachusetts 02125

Re: Herring Cove Beach North Public Access Site Plan

Dear Ms. Simon:

Under the terms of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act, the National Park Service (NPS) at Cape Cod National Seashore (the park) is preparing a plan/Environmental Assessment (EA) for development of a long-term plan for the Herring Cove Beach North public access in consultation with the Provincetown community. The plan/EA will identify and incorporate the values and importance that visitors to the national seashore and local residents place on Herring Cove Beach. The preferred alternative will be based upon sound coastal science and engineering practices, and will be responsive to cultural resource concerns as well as shoreline change, projected sea level rise, and community and visitor recreational use. Appropriate Best Management Practices (BMPs) will be built into the design to avoid or limit impacts to resources.

Herring Cove Beach is of special concern to the residents and visitors of Provincetown, Massachusetts because it is the only remaining Provincetown beach with direct ocean view parking and car-to-sand access for people of all ages and abilities. It is one of six life-guarded beaches managed by Cape Cod National Seashore (the Seashore). The Commonwealth of Massachusetts developed the Herring Cove Beach facilities in the 1950s.The site includes: a one-mile macadam revetment (seawall); two parking lots; and, a bath house and concession stand (which are currently being replaced.) Wave action in late December 2011 caused damage to the asphalt revetment near the bath house and sections of the north parking lot, and coastal areas near the south parking lot. This is not the first time damage to the revetment and parking lot have occurred, and projected sea level rise and climate-related weather patterns threaten the future of

these facilities. Last year's storm damage provided the impetus to develop a long-term solution to maintain or enhance the shoreline's environmental integrity and safe beach access.

The project area is depicted on the enclosed section of the USGS Quadrangle and site conceptual design drawing.

This letter serves as notification that we have begun the compliance process and are proposing to have a plan/EA available for public and regulatory review in the summer of 2013. We appreciate your input on this project and will provide a copy of the review draft EA as soon as it is available. If you have any questions regarding the project, please contact William Burke, Cultural Resources Program Manager, at bill_burke@nps.gov or (508) 255 - 3421, ext 14.

Sincerely,

George E. Price, Jr.
Superintendent

Attachments

cc:
Mashpee Wampanoag Tribe
Wampanoag Tribe of Gay Head-Aquinnah
Provincetown Historical Commission
Pilgrim Monument and Provincetown Museum
Advisory Council on Historic Preservation

United States Department of the Interior

NATIONAL PARK SERVICE
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, Massachusetts 02667
508.771.2144
508.349.9257 Fax

IN REPLY REFER TO:

L7617
X H4217

June 17, 2013

Katry Harris
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue NW, Suite 803
Old Post Office Building
Washington, D.C. 20004

Re: Herring Cove Beach North Public Access Site Plan

Dear Ms. Harris:

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Superintendent

Attachments

cc:
MA Historical Commission
Wampanoag Tribe of Gay Head-Aquinnah
Provincetown Historical Commission
Pilgrim Monument and Provincetown Museum
Mashpee Wampanoag Tribe

United States Department of the Interior

NATIONAL PARK SERVICE
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, Massachusetts 02667
508.771.2144
508.349.9257 Fax

IN REPLY REFER TO:

L7617
X H4217

June 17, 2013

Ms. Bettina Washington
Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head-Aquinnah
20 Black Brook Road
Aquinnah, MA 02535

Re: Herring Cove Beach North Public Access Site Plan

Dear Ms. Washington:

Under the terms of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act, the National Park Service (NPS) at Cape Cod National Seashore (the park) is preparing a plan/Environmental Assessment (EA) for development of a long-term plan for the Herring Cove Beach North public access in consultation with the Provincetown community. The plan/EA will identify and incorporate the values and importance that visitors to the national seashore and local residents place on Herring Cove Beach. The preferred alternative will be based upon sound coastal science and engineering practices, and will be responsive to cultural resource concerns as well as shoreline change, projected sea level rise, and community and visitor recreational use. Appropriate Best Management Practices (BMPs) will be built into the design to avoid or limit impacts to resources.

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George E. Price, Jr.
Superintendent

Attachments

cc:
MA Historical Commission
Mashpee Wampanoag Tribe
Provincetown Historical Commission
Pilgrim Monument and Provincetown Museum
Advisory Council on Historic Preservation

United States Department of the Interior

NATIONAL PARK SERVICE
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, Massachusetts 02667
508.771.2144
508.349.9257 Fax

IN REPLY REFER TO:

L7617
X H4217

June 17, 2013

Ms. Ramona Peters
Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe
483 Great Neck Road
Mashpee, MA 02649

Re: Herring Cove Beach North Public Access Site Plan

Dear Ms. Peters:

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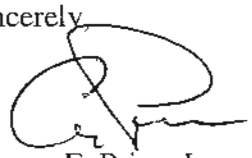
Sincerely,

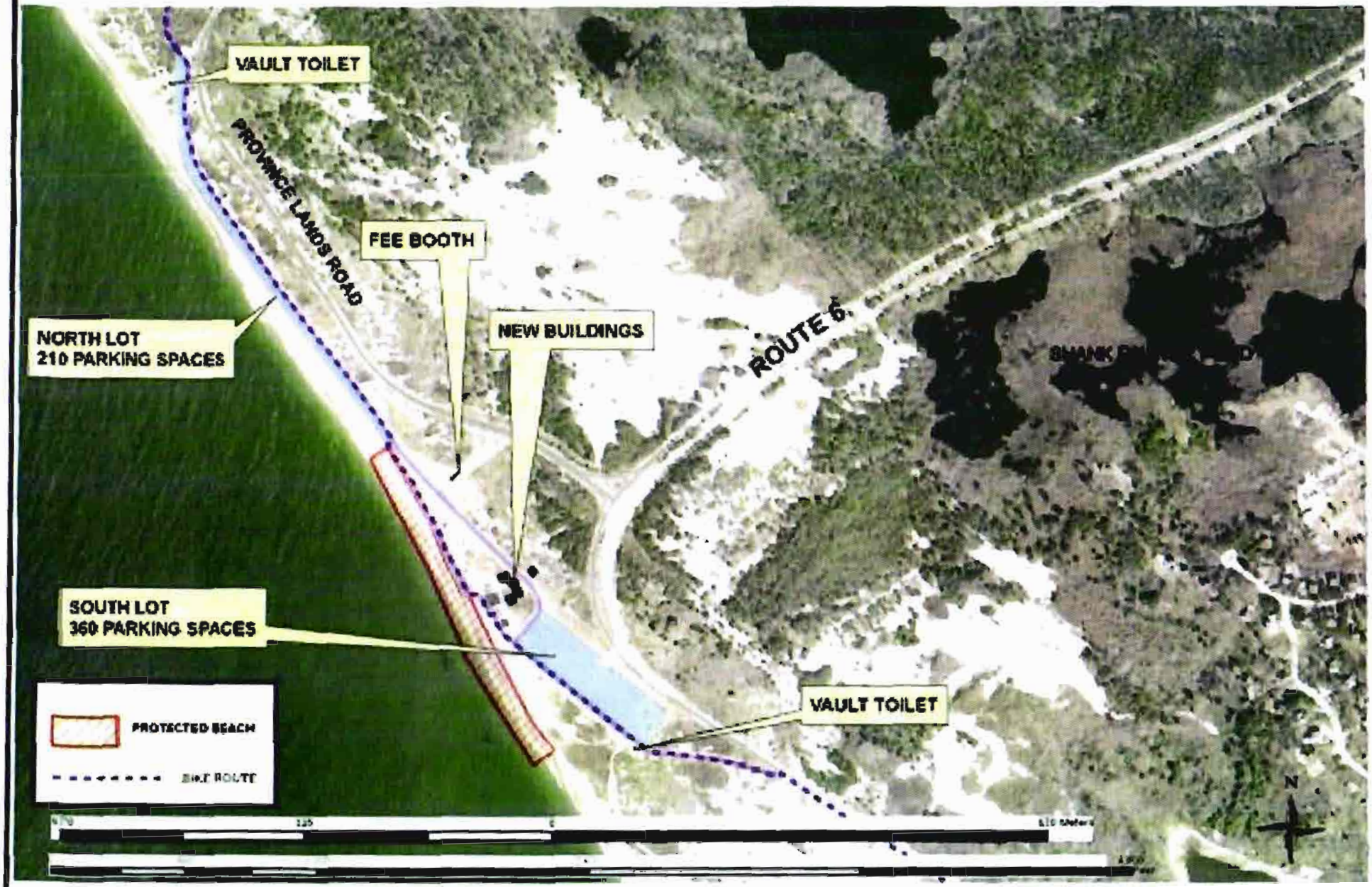


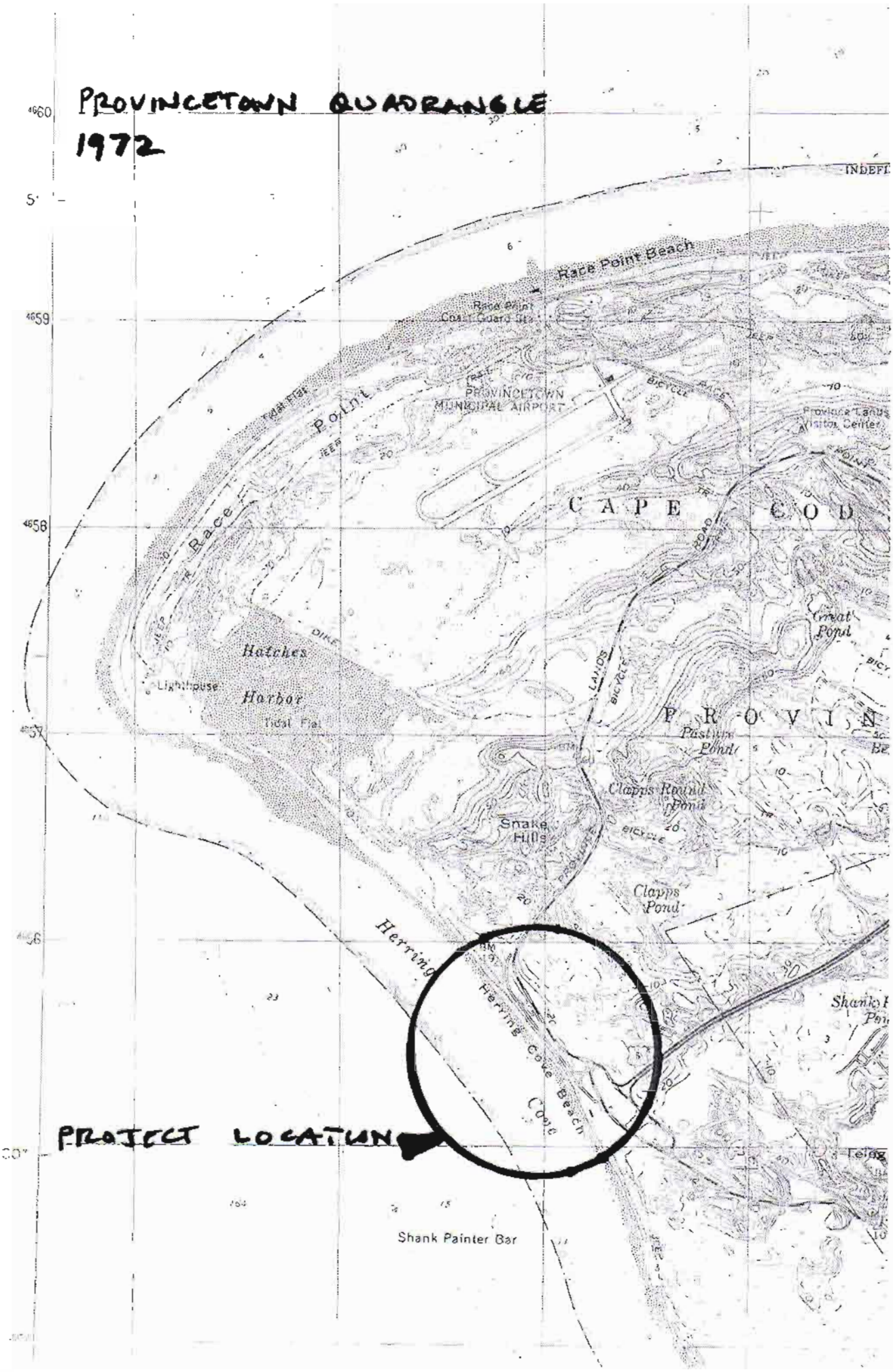
George E. Price, Jr.
Superintendent

Attachments

cc:
MA Historical Commission
Wampanoag Tribe of Gay Head-Aquinnah
Provincetown Historical Commission
Pilgrim Monument and Provincetown Museum
Advisory Council on Historic Preservation

HERRING COVE -- EXISTING CONDITIONS




PROVINCETOWN QUADRANGLE
1972
Race Point Beach
Race Point Coast Guard Sta.
PROVINCETOWN MUNICIPAL AIRPORT
Race Point
CAPE COD
Great Pond
Hatches Harbor
Lighthouse
Tidal Flat
Pasture Pond
Clapps Round Pond
Snake Hills
Clapps Pond
Herring Cove Beach
PROJECT LOCATION
Shank Painter Bar

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

July 1, 2013

George Price, Jr.
Superintendent, National Park Service
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Subject: Long-term Plan for Herring Cove Beach North public access
NHESP Tracking No.: 13-32309

Dear Mr. Price:

The Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife has received your letter (dated 6/12/2013) requesting input for the environmental assessment process for the Herring Cove North Beach public access. The NHESP looks forward to reviewing the formal Environmental Assessment and has the following comments to offer at this time. Based on a review of the information that was provided and the information that is currently contained in our database, the NHESP has determined that the proposed project areas are mapped for or in the vicinity of the following state-listed species:

Scientific Name	Common Name	Taxonomic Group	State Status
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern
Scaphiopus holbrooki	Eastern Spadefoot Toad	Amphibian	Threatened
Charadrius melodus	Piping Plover	Bird	Threatened*
Sterna hirundo	Common Tern	Bird	Special Concern
Sterna dougallii	Roseate Tern	Bird	Endangered*
Sterna paradisaea	Arctic Tern	Bird	Special Concern
Sternula antillarum	Least Tern	Bird	Special Concern

These species are state-listed in accordance with the Massachusetts Endangered Species Act (MESA, MGL c131A) and its implementing regulations (321 CMR 10.00).). *The Piping Plover and the Roseate Tern are also federally protected as "Threatened" and "Endangered", respectively, pursuant to the U.S. Endangered Species Act (ESA, 50 CFR 17.11).

The NHESP agrees that appropriate Best Management Practices (BMPs), as described in your letter, should be built into the design to avoid impacts to state-listed species. As you are aware, Piping Plovers have occasionally nested on Herring Cove Beach to the north of the project area, and could occur in the future (courting adults, nests, or unfledged chicks) in or near the project area. Additionally, Eastern Box Turtles and Spadefoot Toads have consistently been observed within the proposed project areas. However, given the timing and the nature of the proposed work, the NHESP believes the projects are unlikely to impact state-listed species.

Division of Fisheries and Wildlife
Temporary Correspondence: 100 Hartwell Street, Suite 230, West Boylston, MA 01583
Permanent: Field Headquarters, North Drive, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7890
An Agency of the Department of Fish and Game

We appreciate the opportunity to comment on this project at this time and if you have any questions regarding this letter please contact Eve Schlüter, Ph.D., Senior Endangered Species Review Biologist, at (508) 389-6346 (eve.schluter@state.ma.us).

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

APPENDIX B: COASTAL ZONE MANAGEMENT FEDERAL CONSISTENCY DETERMINATION

COASTAL POLICIES

The following represents several key federal and state regulatory permitting agencies and authorities that will need to be considered as alternatives are developed and evaluated for Herring Cove Beach revetment and parking area. The level of permitting is to be determined.

U.S. ARMY CORPS OF ENGINEERS

The Army Corps of Engineers has jurisdiction on the aquatic environment in water of the U.S. within the boundaries of and off the coast of Massachusetts. To be eligible and subsequently authorized, a Section 404 activity must result in no more than minimal impacts to the aquatic environment as determined by the Corps in coordination with the interagency review team and Corps criteria.

Work seaward of the high tide line is subject to General Permit requirements for Navigable Waters. The category of the project determines the extent of the permitting process. Relevant Navigable Waters guidance to Herring Cove facilities include:

Category 1

(a) Repair, replacement and maintenance work
Repair, replacement in kind or maintenance of:
- Existing, currently serviceable, authorized fills and structures
- Amnesty-approved fills and structures

Provided:
- No expansion or change in use.
- Must be rebuilt in same footprint; however minor deviations in structure design allowed.

The New England District office searched but did not find a permit that may have been issued to the Massachusetts Department of Public Works when the state owned the lands, prior to the 1965 repair work by the NPS. In initial consultation, they indicate that the process for any groin proposal would be a tremendous workload, and extensive information on the area's coastal processes would be needed for review of any repair, replacement or maintenance proposal. Their agency will determine any category of review; however, a Category 1 General Permit notification form is expected to be required for revetment removal because it is the only portion of work below mean high water.

STATE POLICIES

MASSACHUSETTS COASTAL ZONE MANAGEMENT PROGRAM

Massachusetts CZM is lead agency for policy related to the state coastal management. For instance, proponents of beach nourishment projects are required to obtain a permit that includes characterizing beach conditions and stability and documenting the physical and chemical properties of the fill and native material. (For CZM guidance for permitting of beach nourishment projects – see http://www.mass.gov/dep/water/resources/bchbod.pdf.

The Coastal Zone Management Act (16 USC Section 1456) also requires that federal agencies adhere to state Coastal Zone Management Plans when conducting projects or activities that affect the coastal zone. These policies recognize the ecological significance of coastal waters and strive to protect both the water quality and the integrity of significant resource areas. All of Cape Cod is within the coastal zone. There is a requirement for review of "coastal effects" in relationship to the state's enforceable Massachusetts Coastal Zone Management (CZM) program policies. The Mass CZM Office will want to see an analysis of non-structural alternatives. A newer, "living shoreline" approach may not be applicable in a coastal situation such as presented at Herring Cove Beach, however other non-structural options will need to be presented.

Relevant Mass. CZM policies and their relationship to this project include the following:

Coastal Hazards Policy #1

Summary Statement

Preserve, protect, restore, and enhance the beneficial functions off storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.

Removal of the asphalt revetment and parking area directly on the coast would restore storm damage prevention functions of the beach.

Coastal Hazards Policy # 2

Summary Statement

Ensure that construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Flood or erosion control projects must demonstrate no significant adverse effects on the project site or adjacent or downcoast areas.

There will be a beneficial effect on sediment transport by reintroduction of a sand sediment source to the coast by removal of the asphalt interfering with the natural systems.

Coastal Hazards Policy #3

Summary Statement

Ensure that state and federally funded public works projects proposed for location within the coastal zone will:

- *Not exacerbate existing hazards or damage natural buffers or other natural resources.*
- *Be reasonably safe from flood and erosion-related damage.*
- *Not promote growth and development in hazard-prone or buffer areas, especially in velocity zones and Areas of Critical Environmental Concern.*
- *Not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource/Improvement Acts.*

The proposed action would not exacerbate existing hazards or significantly damage the natural buffers or other natural resources. The new parking area will be reasonably safe from flood and erosion-related damage because of the natural buffers, and has been elevated above expected base flood levels to account for storm surge potential and sea level rise. It does not promote growth and development in hazard-prone or buffer areas, and it is not within a Coastal Barrier Resource Unit.

Public Access Policy #1

Summary Statement

Ensure that development (both water-dependent or nonwater-dependent) of coastal sites subject to state waterways regulation will promote general public use and enjoyment of the water's edge, to an extent commensurate with the Commonwealth's interests in flowed and filled tidelands under the Public Trust Doctrine.

General public use and enjoyment will be provided by the new beach accommodations. Pedestrian boardwalks or mats will minimize the adverse impacts related to recreational users' dispersed use of the dunes.

Public Access Policy #2

Summary Statement

Improve public access to existing coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation and trail links (land- or water-based) to other

nearby facilities. Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Ensure that the adverse impacts of developments proposed near existing public access and recreation sites are minimized.

The proposed action would improve public access to coastal recreation facilities, specifically Herring Cove Beach and the Province Lands Bicycle Trail, by constructing bicycle accommodations. It also would alleviate automobile traffic issues related to congestion during the summer months when bicyclists and pedestrians also use the area extensively. A safer link between Provincetown and Herring Cove Beach and the Province Lands Bicycle Trail will be provided for bicyclists and pedestrians.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Massachusetts Waterways Program

The Massachusetts Department of Environmental Protection Waterways Program explains that "The Commonwealth's primary tool for protection and promotion of public use of its tidelands and other waterways is Massachusetts General Law Chapter 91, the waterways licensing program…The oldest program of its kind in the nation, Chapter 91 regulates activities on both coastal and inland waterways, including construction, dredging and filling in tidelands, great ponds and certain rivers and streams.

Through Chapter 91, the Commonwealth seeks to preserve and protect the rights of the public, and to guarantee that private uses of tidelands and waterways serve a proper public purpose."

Chapter 91 authorization is needed for five basic types of new and existing unauthorized activities: structures, filling, dredging, change in use, structural alteration, and demolition/removal of structures. Demolition/removal of the asphalt revetment and parking will be reported to the Massachusetts Department of Environmental Protection (Mass DEP) as a public benefit for continued waterfront access.

Massachusetts Wetlands Protection Act

The Massachusetts Wetlands Protection Act (WPA) applies to any construction in or near a wetland resource, including intertidal and subtidal habitat. A fundamental aspect of the federal-state regulatory relationship is that Federal Agencies are exempt from all state and local permitting requirements, except when Congress clearly indicates that the sovereign immunity of the Federal Government is waived. One instance of such a waiver relates to activities resulting in the discharge or run-off of pollutants as presented in Section 313 of the Clean Water Act codified as 33 United States Code Section 1323 (a). Thus, when federal actions "result in the discharge or run-off of pollutants" and there are state and local (e.g., Mass DEP and Conservation Commission) permitting processes regulating these, the national seashore is subject to those permitting requirements.

The Mass. WPA Chapter 131 is far broader in scope than discharge control. The interests protected through this law include other interests beyond pollutants discharge. The sovereign immunity of the Federal Government has not been waived for the other interests. As a result, the national seashore is exempt from the requirement of filing with the Conservation Commission for projects affecting the coastal bank or related issues, except when the discharge or run-off of pollutants is a concern, even

though the activity would otherwise be subject to the review authority if the same activity were being conducted by a non-federal entity on non-federal land.

The proposal would not need a formal filing under the WPA; however the national seashore will provide courtesy notification to the Provincetown Conservation Commission.

Section 401 Water Quality Certification for Dredging

Dredge and/or fill projects in waters and wetlands subject to state and federal jurisdiction if a federal permit is required for the project. It applies to any activity that would result in a discharge of dredged material, dredging, or dredged material disposal greater than 100 cubic yards that is also subject to federal regulation must obtain a 401 Water Quality Certification. The Division of Wetlands and Waterways in the Mass DEP administers the 401 Water Quality Certification Program. As the authority to administer the 401 Water Quality Certification is derived from the Federal Water Pollution Control Act, only projects that require a federal permit are subject to 401 review.

There is no discharge of dredge or fill materials into wetlands under this project, therefore there is no need to file for Water Quality Certification.

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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 land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical 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.

September 2013